Infoteca's E-Journal

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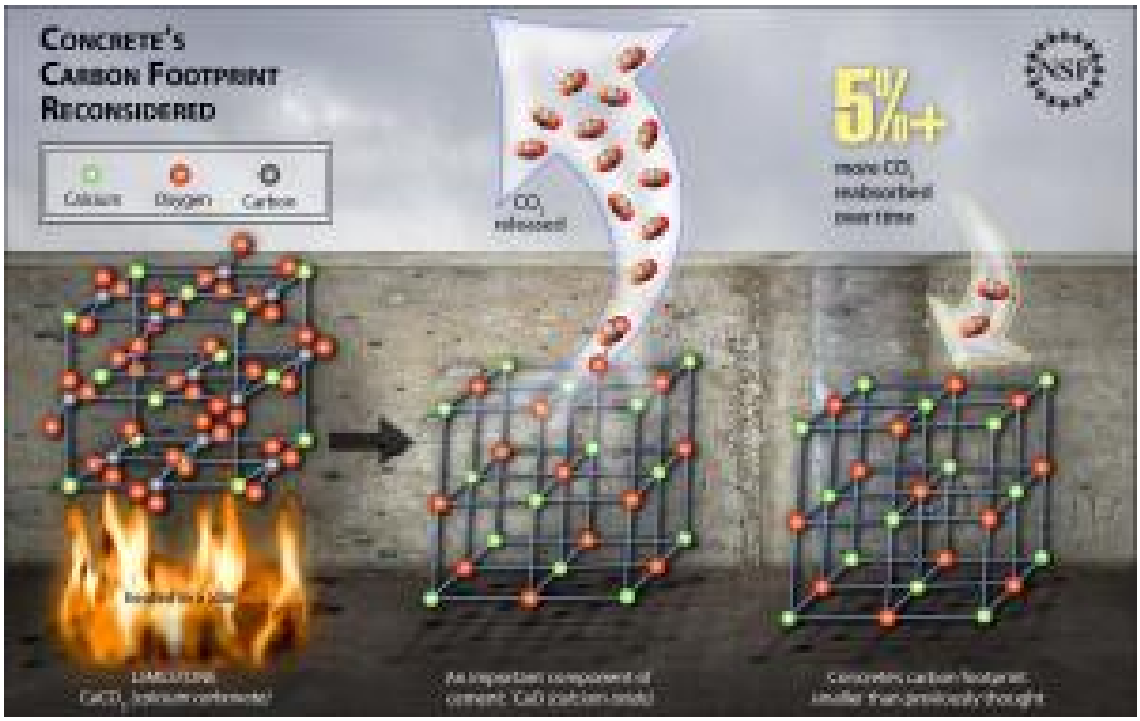
How Solid Is Concrete's Carbon Footprint?



Concrete's carbon footprint is fairly large due to two factors: the energy used to heat limestone (CaCO3) in kilns to form CaO, one of the major components in concrete, and the large quantities of carbon dioxide released as the conversion of limestone to CaO proceeds. However, a recent study has shown that over time, five percent, or more, of the lost carbon dioxide reabsorbs back into the concrete, thereby reducing the ultimate carbon footprint. (Credit: Zina Deretsky, National Science Foundation)

ScienceDaily (May 24, 2009) — Many scientists currently think at least 5 percent of humanity's carbon footprint comes from the concrete industry, both from energy use and the carbon dioxide (CO_2) byproduct from the production of cement, one of concrete's principal components.

Yet several studies have shown that small quantities of CO_2 later reabsorb into concrete, even decades after it is emplaced, when elements of the material combine with CO_2 to form calcite.

A study appearing in the June 2009 Journal of Environmental Engineering suggests that the re-absorption may extend to products beyond calcite, increasing the total CO_2 removed from the atmosphere and lowering concrete's overall carbon footprint.

While preliminary, the research by civil and environmental engineering professor Liv Haselbach of Washington State University re-emphasizes findings first observed nearly half a century ago--that carbon-based chemical compounds may form in concrete in addition to the mineral calcite-now in the light of current efforts to stem global warming.

"Even though these chemical species may equate to only five percent of the CO_2 byproduct from cement production, when summed globally they become significant," said Haselbach. "Concrete is the most-used building material in the world."

Researchers have known for decades that concrete absorbs CO_2 to form calcite (calcium carbonate, $CaCO_3$) during its lifetime, and even longer if the concrete is recycled into new construction--and because concrete is somewhat permeable, the effect extends beyond exposed surfaces.

While such changes can be a structural concern for concrete containing rebar, where the change in acidity can damage the metal over many decades, the $CaCO_3$ is actually denser than some of the materials it replaces and can add strength.

Haselbach's careful analysis of concrete samples appears to show that other compounds, in addition to calcite, may be forming. Although the compounds remain unidentified, she is optimistic about their potential.

"Understanding the complex chemistry of carbon dioxide absorption in concrete may help us develop processes to accelerate the process in such materials as recycled concrete or pavement. Perhaps this could help us achieve a nearly net-zero carbon footprint, for the chemical reactions at least, over the lifecycle of such products."

That is the thrust of Haselbach's current NSF-funded work, where she is now looking at evaluating the lifecycle carbon footprint of many traditional and novel concrete applications, and looking for ways to improve them.

"This work is part of the portfolio of studies that NSF is funding in this vital area," added Bruce Hamilton, director of NSF's environmental sustainability program and a supporter of Haselbach's work. "Research relating to climate change is a priority."

Adapted from materials provided by National Science Foundation.

http://www.sciencedaily.com/releases/2009/05/090518121000.htm

Optimal Trip And Load Planning

How can companies maximize truck capacity utilization and at the same time plan trips so that the burden on the environment and transport costs are reduced? A new software system couples cargo space utilization and trip planning. (Credit: Image courtesy of Fraunhofer-Gesellschaft)

ScienceDaily (May 24, 2009) — How can companies maximize truck capacity utilization and at the same time plan trips so that the burden on the environment and transport costs are reduced? A new software system couples cargo space utilization and trip planning.

A company wants to deliver paper to five customers in Bavaria. The trip planning software currently used calculates that one truck will be enough to cover the locations in central Bavaria if another truck on the Baden-Württemberg route takes over two of the deliveries. The problem is that, although the trips have been optimized, the trucks are not fully loaded. "At present, transport companies first compile the orders and then assign them to trips and vehicles. Truck capacity utilization is only optimized afterwards. This often means that optimal route planning is neglected," explains Dr.-Ing. Bernhard van Bonn, Deputy Head of Department at the Fraunhofer Institute for Material Flow and Logistics IML in Dortmund.

The aim is to bring this dilemma to an end soon. In the Efficient Load project, logistics experts from the IML are working together with the industrial partners GEFCO and M-Real as well as the Berlin software company PSI on effectively combining cargo space utilization and route planning. This could considerably reduce transport costs in future.

"Although software tools for trip planning and cargo space utilization are used, they are not combined, which means that only one aspect is actually optimized," explains van Bonn. Efficient Load harmonizes capacity utilization and trip planning in a single step – and significantly improves truck use. The software optimizes transshipment, order combination, loading sequence and route planning. Stephan Sirrenberg from project partner M-Real expects the new system to reduce ton-kilometers by 15 to 20 per cent. Every month the paper manufacturer makes around 41,000 deliveries. 16,500 trucks transport around 345,000 tons of paper to customers in more than 100 countries. The effective combination of capacity and route optimization will reduce energy costs, as well as toll charges, considerably.

The research scientists have been developing the software since early 2008 as a twelve-stage concept taking all the important parameters into account. By the end of 2009, GEFCO and M-REAL should have an up-and-running version which can be integrated without difficulty in their trip planning software. At the transport logistik trade show from May 12 to 15 in Munich, the researchers are presenting Efficient Load on the Fraunhofer joint stand in Hall B2, Stand 501/602.

Adapted from materials provided by Fraunhofer-Gesellschaft.

http://www.sciencedaily.com/releases/2009/05/090513121044.htm

Pea-sized Seahorse, Bacteria That Life In Hairspray, Caffeine-free Coffee Among Top 10 New Species Of 2008

Among this year's top 10 picks for new species is a tiny seahorse -- Hippocampus satomiae -- with a standard length of 0.54 inches (13.8 millimeters) and an approximate height of 0.45 inches (11.5 millimeters). This pygmy species was found near Derawan Island off Kalimantan, Indonesia, and described by Sara Lourie and Rudie Kuiter. The top 10 list of new species is announced annually by the International Institute for Species Exploration at ASU. (Credit: Photo by John Sear)

ScienceDaily (May 23, 2009) — The International Institute for Species Exploration at Arizona State University and an international committee of taxonomists – scientists responsible for species exploration and classification – have announced the top 10 new species described in 2008.

On the list are a pea-sized seahorse, caffeine-free coffee and bacteria that live in hairspray. The top 10 new species also include the very tiny (a snake just a slither longer than 4 inches or 104 millimeters), the very long (an insect from Malaysia with an overall length of 22.3 inches or 56.7 centimeters) the very old (a fossilized specimen of the oldest known live-bearing vertebrate) and the very twisted (a snail whose shell twists around four axes). Rounding out this year's list are a palm that flowers itself to death, a ghost slug from Wales and a deep blue damselfish.

The taxonomists also are issuing an SOS – State of Observed Species – report card on human knowledge of Earth's species. In it, they report that 18,516 species new to science were discovered and described in 2007.*

Among this year's top 10 picks is a tiny seahorse – *Hippocampus satomiae* – with a standard length of 0.54 inches (13.8 millimeters) and an approximate height of 0.45 inches (11.5 millimeters). This pygmy species was found near Derawan Island off Kalimantan, Indonesia. The name – satomiae – is "in honour of Miss Satomi Onishi, the dive guide who collected the type specimens."

From the plant kingdom is a gigantic new species and genus of palm – *Tahina spectablilis* – with fewer than 100 individuals found only in a small area of northwestern Madagascar. This plant flowers itself to death, producing a huge, spectacular terminal inflorescence with countless flowers. After fruiting, the palm dies and collapses. Soon after the original publication of the species description, seeds were disseminated throughout the palm grower community, to raise money for its conservation by the local villagers. It has since become a highly prized ornamental.

Also on the top 10 list is caffeine-free coffee from Cameroon. *Coffea charrieriana* is the first record of a caffeine-free species from Central Africa. The plant is named for Professor André Charrier, "who managed coffee breeding research and collecting missions at IRD (Institut de Recherche pour le Développement) during the last 30 years of the 20th century."

And, in the category of "spray on new species" is an extremophile bacteria that was discovered in hairspray by Japanese scientists. The species – *Microbacterium hatanonis* – was named in honor of Kazunori Hatano, "for his contribution to the understanding of the genus Microbacterium."

Phobaeticus chani made the list as the world's longest insect with a body length of 14 inches (36.6 centimeters) and overall length of 22.3 inches (56.7 centimeters). The insect, which resembles a stick, was found in Borneo, Malaysia.

The Barbados Threadsnake – *Leptotyphlops carlae* – measuring 4.1 inches (104 millimeters) is believed to be the world's smallest snake. It was discovered in St. Joseph Parish, Barbados.

The ghost slug – *Selenochlamys ysbryda* – was a surprising find in the well-collected and densely populated area of Cardiff, Glamorgan, Wales.

A snail – *Opisthostoma vermiculum* – found in Malaysia, represents a unique morphological evolution, with a shell that twists around four axes. It is endemic to a unique limestone hill habitat in Malaysia.

The other two species on the top 10 list are fish – one found in deep-reef habitat off the coast of Ngemelis Island, Palau, and the other a fossilized specimen of the oldest known live-bearing vertebrate.

Chromis abyssus – a beautiful species of damselfish made it to the top 10 representing the first taxonomic act of 2008 and the first act registered in the newly launched taxonomic database Zoobank. As a result, in the first month following its original description, it was the most downloaded article in Zootaxa's history and was among the top 10 downloaded articles for 11 months in 2008. The discovery also highlights how little is known about deep-reef biodiversity.

Also on the top 10 list is a fossilized specimen – *Materpiscis attenboroughi* – the oldent known vertebrate to be viviparous (live bearing). The specimen, an extremely rare find from Western Australia, shows a mother fish giving birth approximately 380 million years ago. The holotype specimen has been nicknamed "Josie" by the discoverer, John Long, in honor of his mother.

"Most people do not realize just how incomplete our knowledge of Earth's species is or the steady rate at which taxonomists are exploring that diversity. We are surrounded by such an exuberance of species diversity that we too often take it for granted," says Quentin Wheeler, an entomologist and director of the International Institute for Species Exploration at Arizona State University.

The annual top 10 new species announcement and issuance of the SOS report commemorate the anniversary of the birth of Carolus Linnaeus, who initiated the modern system of plant and animal names and classifications. The 300th anniversary of his birth on May 23 was celebrated worldwide in 2007. Last year marked the 250th anniversary of the beginning of animal naming.

There are an estimated 1.8 million species that have been described since Linnaeus initiated the modern systems for naming plants and animals in the 18th century. Scientists estimate there are between 2 million and 100 million species on Earth, though most set the number closer to 10 million.

The SOS report card summarizes the number of major pspecies.asu.edulant and animal species newly described for the most recent year of complete data. The majority of the 18,516 species described (named) in 2007 were invertebrate animals (75.6 percent), vascular plants (11.1 percent) and vertebrates (6.7 percent). This year's SOS report also includes data for prokaryotes (bacteria and Archaea) in addition to protists.

The State of Observed Species report and list of top 10 new species issued annually by ASU's International Institute for Species Exploration is part of its public awareness campaign to shine attention on biodiversity and the field of taxonomy. Last year's list and report are online at species.asu.edu.

An international committee of experts, chaired by Janine N. Caira of the University of Connecticut, selected the top 10 new species for this year's list. Nominations were invited through the species.asu.edu Web site and also generated by institute staff and committee members.

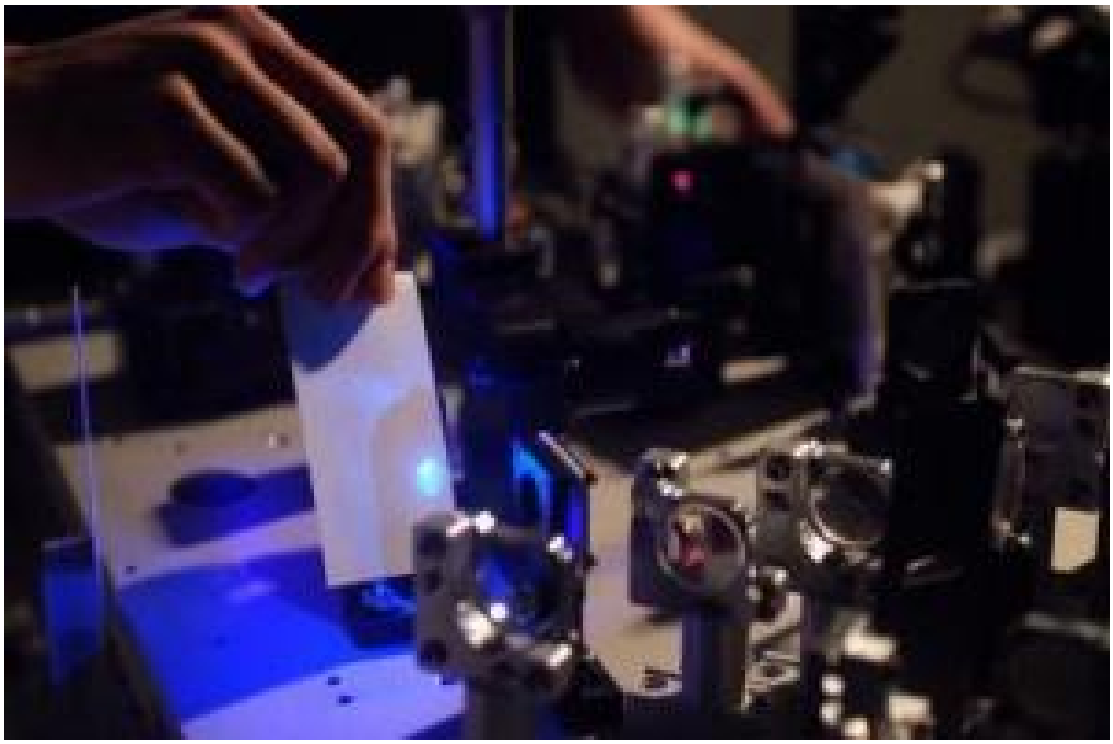
The Caira committee had complete freedom in making its choices and developing its own criteria, from unique attributes or surprising facts about the species to peculiar names, Wheeler notes.

*The SOS report was compiled by ASU's International Institute for Species Exploration in partnership with the International Commission on Zoological Nomenclature, International Plant Names Index, Zoological Record published by Thomson Reuters, and the International Journal of Systematic and Evolutionary Microbiology.

Adapted from materials provided by Arizona State University.

http://www.sciencedaily.com/releases/2009/05/090522122314.htm

Surprising Twist To Photosynthesis: Scientists Swap Key Metal Necessary For Turning Sunlight Into Chemical Energy



The reactions that convert light to chemical energy happen in a millionth of a millionth of a second, which makes experimental observation extremely challenging. A premier ultrafast laser spectroscopic detection system established at the Biodesign Institute, with the sponsorship of the National Science Foundation, acts like a high-speed motion picture camera. It splits the light spectrum into infinitesimally discrete slivers, allowing the group to capture vast numbers of ultrafast frames from the components of these exceedingly rapid reactions. These frames are then mathematically assembled, allowing the group to make a figurative "movie" of the energy transfer events of photosynthesis. (Credit: Arizona State University Biodesign Institute)

ScienceDaily (May 23, 2009) — Photosynthesis is a remarkable biological process that supports life on earth. Plants and photosynthetic microbes do so by harvesting light to produce their food, and in the process, also provide vital oxygen for animals and people.

Now, a large, international collaboration between Arizona State University, the University of California San Diego and the University of British Columbia, has come up with a surprising twist to photosynthesis by swapping a key metal necessary for turning sunlight into chemical energy.

The team, which includes: ASU scientists Su Lin, Neal Woodbury, Aaron Tufts and James P. Allen; UBC colleagues J. Thomas Beatty, Paul R. Jaschke, Federico I. Rosell and A. Grant Mauk; Mark Paddock, UCSD; Haiyu Wang, Jilin University, China, described their findings in the May 11 early online edition of the *Proceedings of the National Academy of Sciences*.

In the heart of every green leaf are pigments called chlorophyll, which not only give most plants their color, but also along with the yellow and orange carotenoid pigments, are key molecules that harvest light across the spectrum.

In all plant chlorophylls, only one particular metal, magnesium, is held tightly within the molecule's center.

During photosynthesis, plants have two photosystems that work in tandem: photosystem I and photosystem II. To peer at the inner workings of photosynthesis, the team used a hardy, well-studied, photosynthetic bacterium called Rhodobacter sphaeroides. An organism similar to this purple bacterium was likely one of the earliest photosynthetic bacteria to evolve. The purple bacteria possess a simplified system similar to photosystem II.

The center stage of photosynthesis is the reaction center, where light energy is funneled into specialized chlorophyll binding proteins. The research team had previously demonstrated that the movement of the reaction center proteins during photosynthesis facilitates the light-driven movement of electrons between molecules in the reaction center, helping the plant or bacteria to harness light energy efficiently even if conditions aren't optimal. Every time the team introduced disruptions into this electron pathway, the proteins were able to compensate by moving and energetically guiding the electrons through their biological circuit.

"One of our research strategies is to introduce mutations into the bacteria and study how these affect the energy conversion efficiency of the reaction center," said Su Lin, PhD, senior researcher at ASU's Department of Chemistry & Biochemistry and Biodesign Institute, and lead author of the study. "Carefully-designed aberrations provide extensive information about the normal mechanism of energy conversion in reaction centers, just like studying a disease clarifies the parameters of health for the involved biochemical pathways and tissues. From this, we can learn a lot about the most basic mechanisms of photosynthesis."

The reactions that convert light to chemical energy happen in a millionth of a millionth of a second, which makes experimental observation extremely challenging. A premier ultrafast laser spectroscopic detection system that Lin has built, with the sponsorship of the National Science Foundation, acts like a high-speed motion picture camera. It splits the light spectrum into infinitesimally discrete slivers, allowing the group to capture vast numbers of ultrafast frames from the components of these exceedingly rapid reactions. These frames are then mathematically assembled, allowing the group to make a figurative 'movie' of the energy transfer events of photosynthesis.

The current research study began when Paul R. Jaschke, a graduate student with professor J. Thomas Beatty in the Department of Microbiology and Immunology at the University of British Columbia, discovered a mutant that replaced the magnesium metal found in the reaction center with zinc.

"We initially thought this reaction center was non-functional," said Beatty. "We were forced to think in new ways to explain the surprising results, which led to some nice insight."

Lin carefully measured the light absorption spectra for the naturally occurring magnesium reaction center and compared it to the mutant reaction center that was replaced with zinc bacteriochlorophylls. She found that, though the zinc-coordinated reaction center is comprised of six bacteriochlorophylls, changing their structure to a configuration similar to that used in plant photosystem I reaction centers, surprisingly, the data from the reaction kinetics and the energy conversion efficiency were almost identical to the magnesium containing reaction center.

"Amazingly, the reaction center still works with essentially the same physical chemical properties as the normal system," said Neal Woodbury, deputy director of the Biodesign Institute. "This was a real puzzle when Su first did these measurements, but she was able to figure out why."

"The electron transfer driving force can be determined by either the properties of the metal cofactors themselves or through their interaction with the protein," said Lin. "In the case of the zinc reaction center, the driving force is regulated through the coordination of the metal."

"Once again, biology shows its resilience so that changes in one area are compensated by changes in others and the protein's ability to dynamically adjust," said Woodbury.

The results may enable researchers to explore a deeper understanding of the structure, function, and evolution of photosynthesis reaction centers in photosystems I and II. Of particular interest, are studies that focus on the interaction between chlorophylls and protein, which differs in naturally occurring reaction center variants. The team may also conduct future experiments to understand the metal substitution limitations of the reaction center and track the protein movements that may be occurring in the reaction center that helps to optimize photosynthesis.

Their results may have long-term practical applications for the development of next-generation solar cells, which could, through biomimicry of photosynthesis, greatly boost the energy efficiency compared with current technology. The robustness of the natural system may offer some useful lessons for engineers trying to improve on current technologies, and bring the costs of solar panels down to the average consumer.

Woodbury has proposed that there might be a way to increase the flexibility of the system used in organic solar cells by incorporating solvents that move on a variety of time scales that could "tune" the molecules to work in a wider variety of conditions.

Journal reference:

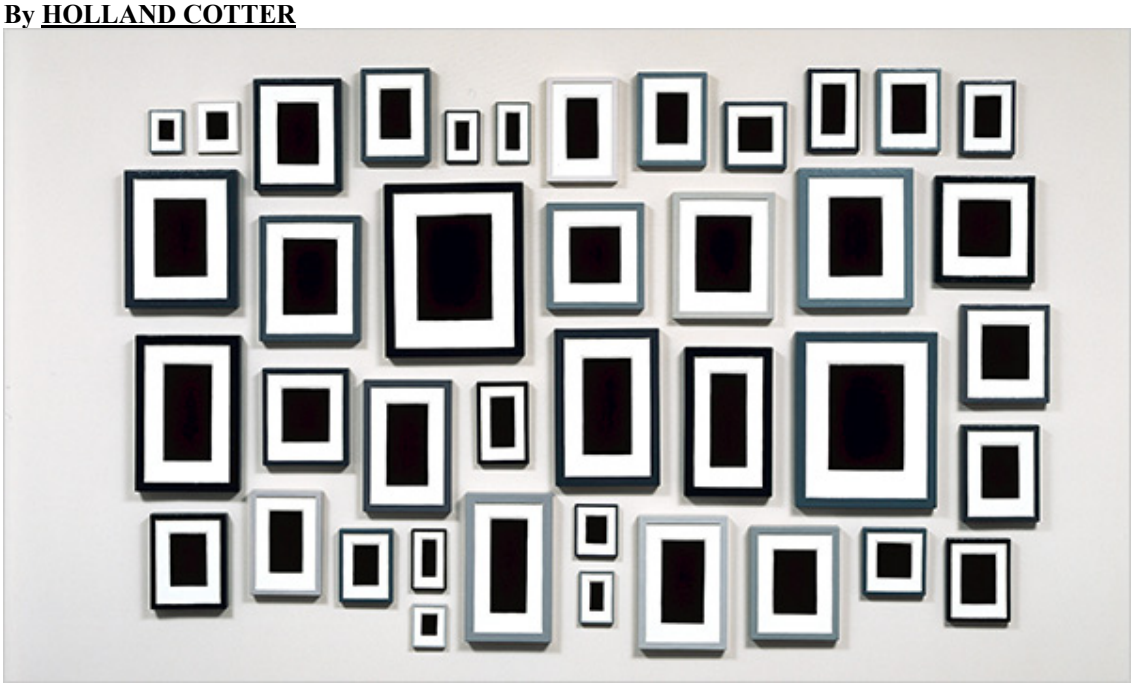
1. Su Lin, Neal Woodbury, Aaron Tufts and James P. Allen, J. Thomas Beatty, Paul R. Jaschke, Federico I. Rosell and A. Grant Mauk; Mark Paddock, Haiyu Wang. **Electron transfer in the Rhodobacter sphaeroides reaction center assembled with zinc bacteriochlorophyll**. *Proceedings of the National Academy of Sciences*, 2009; DOI: 10.1073/pnas.0812719106

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

http://www.sciencedaily.com/releases/2009/05/090511180653.htm

Framing the Message of a Generation

By HOLLAND COTTER



HOW does cultural history get written? Who chooses which portraits will hang in the hall of fame, which art will live on in museums, which books will end up on the classics shelf, which music will be standard fare in tomorrow's concert halls?

We are encouraged to think that such judgments have lives of their own, are decided by a kind of natural selection. The most beautiful art will prevail, the most ambitious, the most morally uplifting, the most universal in emotional appeal. Everything else is by default of a lesser order. We shouldn't fret if it disappears.

This view is, of course, wishful thinking. Moral and universal are concepts up for grabs; my notion of beautiful may leave you cold. Many of our masterpieces owe their origins to the distinctly immoral ambitions of power politics, their survival to prosaic strokes of luck, their present pre-eminence to institutional marketing, scholarly attention and popular sentiment. Even so, survival can be chancy. Fine things are tossed out and crummy things kept all the time.

In the case of art from the deep past we can usually only guess at how the selection process worked. With contemporary art we can see it in operation. We can see history being written — recorded, edited, enhanced, invented — right before our eyes. It can be a disturbing sight.

I was reminded of this after visiting two big history-writing and history-inventing exhibitions in New York this spring, "The Pictures Generation, 1974-1984" at the Metropolitan Museum of Art (through Aug. 2) and "The Generational: Younger Than Jesus" at the New Museum (through July 5).

Both are eagerly anticipated surveys, one of influential art from the near past, the other of art very emphatically of the here and now, and with an eye to the future. And neither show is modest in its aims. Both speak of art they are presenting in epochal terms, as defining not styles or trends but generations. This is a bold take on history, but a tricky one, gratifyingly dramatic, inevitably distorting.

Thinking in terms of generations is by no means peculiar to the field of art, but it is more common there than in literature or music. Writing and composing have always been inherently solitary activities; the results can be transmitted over time and space through copies and without the presence of the creator. By contrast, the making of art in its most traditional forms — painting and sculpture — was historically a social activity. Almost everything about it was concrete. Training was closely supervised; execution was a multistep, labor-intensive process most efficiently carried out by groups.

The master-apprentice bond, the passing of expertise and values from one era to the next, is part of an ancient story. The figure of the lonely artist in his garret is a relatively recent one. Even in the modern era the old social model has persisted in the concept of an avant-garde. True, the generational exchange there is contentious, with torches dropped as quickly as they were passed. But an old collective model remains intact.

There's a little bit of all of this in the story told by the Met show, which begins in the early 1970s at the California Institute of the Arts in Los Angeles. There several students of the Conceptualist artist John Baldessari were lifting photographic images from popular sources — advertising, television, films, pornography — and repositioning them in conventional art formats. In the process the original images took on unsuspected, often loaded meanings, and the new work threw various aesthetic givens, like originality and expressivity, into confusion.

As it turned out, artists in other cities were on a similar track and eventually everyone converged in New York. There in 1977 five of the artists — Troy Brauntuch, Jack Goldstein, Sherrie Levine, Robert Longo and Philip Smith — appeared in a group exhibition at Artists Space in Lower Manhattan. The show was organized by the critic Douglas Crimp; it was called "Pictures," and because it looked different from other shows around, it was noticed.

When Mr. Crimp published a revised version of his theory-intensive exhibition essay in October, the hot academic journal of the day, the "Pictures" phenomenon was born. The show assumed mythic status; for a certain insider audience it came to define the most significant new art of the day, and the beginning of the postmodernist wave. The art market confirmed this appraisal.

Now, three decades later, the Met confirms it again by bringing together 30 artists associated with that early wave, assigning them generational status and naming an entire decade of art in their honor, essentially writing their history. The show is rich and deeply interesting, but as history it has problems. The most obvious of them is factual. Of the original five "Pictures" artists, only four are acknowledged. No work by Mr. Smith is on view; his name is mentioned only once in the catalog. His portrait has effectively been removed from the hall of fame.

In this the Met has followed Mr. Crimp's lead. In the October magazine version of his exhibition essay, he dropped the discussion of Mr. Smith and focused instead on Cindy Sherman, an artist who hadn't been in the show. Such revisionism is, perhaps, a curator's privilege but not a historian's. In the interest of accuracy Mr. Smith should have been included in the Met show. As it is, his absence turns historical record into invention and suggests how exclusionary a "generational" history can be.

The show is based on several broader exclusions. One of the notable features of the "Pictures" group was the number of women it included, among them Ericka Beckman, Dara Birnbaum, Barbara Bloom, Sarah Charlesworth, Nancy Dwyer, Barbara Kruger, Louise Lawler, Laurie Simmons, Ms. Levine and Ms. Sherman.

Yet the Met show makes only cursory mention of the feminist movement and none at all of the presence of the Feminist Art Program at CalArts in the early 1970s, well known for its experiments with nontraditional mediums and for its critique of the representation of women in popular culture and in art. Other elements essential to any comprehensive account of American art between 1974 and 1984 land on the cutting-room floor. Abstract painting was flourishing in these years, as was demonstrated by the traveling exhibition "High Times, Hard Times: New York Painting 1967-1975," organized by Independent Curators International three years ago. It rates scant notice here.

Also, in the Met's account the American art world during the "Pictures Generation" was uniracial, though in reality the years covered by the show saw the burgeoning of multiculturalism as a movement, documented in "The Decade Show: Framework of Identity in the 1980s" jointly organized in 1990 by the New Museum, the Museum of Contemporary Hispanic Art and the Studio Museum in Harlem.

Many of the African-American, Asian-American, Latino and American Indian artists in that show were contemporaries of the "Pictures" artists. Yet in the Met's virtually context-free version of generation, they exist, if at all, in some invisible, out-of-the-mainstream realm. In the title of an essay for the "Decade Show" catalog, the art historian Lowery Stokes Sims concisely summed up a division that existed at the time and that the Met show perpetuates: "Cultural Pluralism Versus the American Canon."

The Met exhibition is essentially a reconstitution of a section of that canon as it was formulated 30 years ago, and as such it is a painstakingly assembled and fascinating document. It is now, however, the generational picture promised by its title, with the panoramic sweep that such a picture implies. For its detailed layering, the show feels like an artifact, a slice of history hermetically sealed.

The concept of generation is comparably, though differently, fraught in "Younger Than Jesus," where we are not really dealing with history at all, or at least not with history in hindsight.
Conceived as an international triennial, the show is, by design, about new art produced in a periodically refreshed present. And its generational parameters are determined by a single factor: birthdate. Only artists age 33 or younger were considered for inclusion, making the show by virtue of a statistic, a "Millennial Generation" roundup.
Surprisingly, considering its programmed nowness, this exhibition, like the one at the Met, gives the impression of being an artifact. It comes across as a kind of classic demonstration of the youth-for-youth's-sake impulse that has for some time now dominated the art industry, ostensibly supplying transfusions of fresh blood, but in fact promoting academicism and conformity.
A scan of the catalog's biographies confirms that, almost without exception, the artists in the show are products of art schools, as often as not intensely professionalized, canon-driven environments. This may help explain why so much of the work on view comes with art historical references and borrowings, tweaks on tweaks on tweaks so intricate and numerous as to defy listing.
The same biographies reveal that nearly all of these 33-and-under artists already have substantial careers in progress, with solo shows in commercial galleries, appearances in international surveys and so on. So this isn't a promising-newcomer event. It's a market-vetted product and one that, my guess is, entailed relatively little adventuring on the part of its organizers. That much of the work might easily have been found and delivered over the Internet may be the show's most distinctive generational feature.
Is same generation a useful basis for writing history? Obviously the answer is yes and no. For years now scholars have questioned the validity of viewing the cultural past and the present through the old apparatus of renaissances, dynasties and "periods." They see these categories for what they are: packaging designed to sell an account of events that will go down smoothly and leave no spaces blank or questions unanswered. Generations could be added to the list.
Isn't the point of art, though, to acknowledge that some questions can never be answered, but to ask them anyway? Isn't part of the job of artists to refuse smoothness and to keep opening up space, formal, temporal, psychic, emotional, whatever you want to call it? In the end the generational model may be most useful for showing us the artists who don't fit, who aren't interested, who think old when they're young and young when they're old, to whom it may or may not occur as they walk past the hall of fame, "not me, not here, not yet."

http://www.nytimes.com/2009/05/31/arts/design/31cott.html?_r=1&th&emc=th

Back to Nature, in Pictures and Action

By JORI FINKEL

Los Angeles

SEBASTIÃO SALGADO sounds as if he's slightly allergic to Los Angeles. It's not just that this celebrated Brazilian photojournalist has been sniffling since he arrived in the city, explaining: "I was born in a tropical ecosystem. I'm not used to these plants." It's also that he peppers his description of the city with words like strange and crazy, noting that he was mesmerized by the sight of the endless stream of automobile traffic as his plane made its descent.

The urban sprawl of Los Angeles is, in any case, a far cry from the remote, sparsely populated jungle and desert locations where he has been traveling for his epic, ecological work in progress "Genesis." Famous for putting a human face on economic and political oppression in developing countries, Mr. Salgado is photographing the most pristine vestiges of nature he can find: pockets of the planet unspoiled by modern development. He has visited the seminomadic Zo'e tribe in the heart of the Brazilian rain forest and weathered desolate stretches of the Sahara. Next up: two months in the Brooks mountain range of Alaska on the trail of caribous and Dall sheep.

But this brand of environmentalism is costly enough to send him back to major cities for support. That's what brought him here for a three-day whirlwind of talks, meetings and parties. One night he gave a slide show featuring new work from "Genesis" to a sold-out crowd at the Hammer Museum. The next evening he was a guest of honor at a fund-raiser at the Peter Fetterman gallery in Santa Monica, where some of his new work appears in his show "Africa," through Sept. 30. After that it was off to San Francisco for a benefit dinner given by Marsha Williams before returning to Paris, which he considers home along with Vitória, Brazil.

It might sound like a punishing schedule, but the 65-year-old photographer says he doesn't mind and doesn't lose focus on work even when flocked by art collectors and celebrity backers. Sitting down at the Peter Fetterman gallery, with his image of zebras in Namibia hanging overhead, Mr. Salgado compared his time away from nature to the potentially disruptive moment when he has to change the film in his camera, when he likes to close his eyes and sing so as not to lose concentration.

"I came here for special things, but my head is there, my body is there," he said with an intent expression and a gentle Portuguese accent. "I might be sleeping in a hotel room in Los Angeles, but in my mind I am always editing pictures."

For "Genesis," an eight-year project now more than half completed, he is piecing together a visual story about the effects of modern development on the environment. Yet rather than document the effects of, say, pollution or global warming directly, he is photographing natural subjects that he believes have somehow "escaped or recovered from" such changes: landscapes, seascapes, animals and indigenous tribes that represent an earlier, purer — "pristine" is a favorite word — state of nature.

In this way "Genesis" is a grand, romantic back-to-nature project, combining elements of both the literary pastoral and the sublime. Mr. Salgado also describes it as a return to childhood, as he was raised on a farm in the Rio Doce Valley of southeastern Brazil — then about 60 percent rain forest — that suffered from terrible erosion and deforestation. Years later, in 1998, he and his wife, Lélia, founded the Instituto Terra on 1,500 acres of this land to undertake an ambitious reforestation project. His wife, who also designs his books and exhibitions, is the institute's president; he is vice president and the institute's most famous spokesman. Or, as Ian Parker wrote in The New Yorker, Mr. Salgado is more than a photojournalist, "much the way Bono is something more than a pop star."

In short, while the Instituto Terra is the locally rooted arm of his environmental activism, "Genesis" is its globally minded, photo-driven counterpart. Since undertaking the series in 2004, he has visited some 20 different sites across 5 continents.

He began with a shoot in the Galápagos Islands that paid homage to Darwin's studies there. (Mr. Salgado says his title, "Genesis," is not meant to be religious.) "Darwin spent 37 to 40 days there," he said. "I got to spend about three months there, which was fabulous." He was thrilled to see for himself evidence of natural selection in species like the cormorant, a bird that lost its ability to fly after a history of foraging for food underwater, not by air.

Last fall he spent two months in Ethiopia, hiking some 500 miles (with 18 pack donkeys and their owners) from Lalibela into Simien National Park to shoot the mountains, indigenous tribes and rare species like a very hairy baboon known as the Gelada. "I was traveling in this area in the same way people did 3,000 to 5,000 years ago," he said.

Well, almost the same way. He did carry a satellite phone, which made him the point person for receiving news of the United States election in November. "When we found out that Obama won, everyone driving these donkeys, everyone was jumping up and down," he said. He called Mr. Obama's election "a victory for the planet."

He is cautiously optimistic about his own environmental work. "I'm 100 percent sure that alone my photographs would not do anything. But as part of a larger movement, I hope to make a difference," he said. "It isn't true that the planet is lost. We must work hard to preserve it."

His earlier projects were also driven by a sense of urgency. Before becoming a photographer he did doctoral work in agricultural economics at the University of Paris and served as an economist for the International Coffee Organization in London. You can see this training in the scope and complexity of his photography.

"Workers," a seven-year project completed in 1992, featured images of laborers from 26 countries, including his acclaimed pictures of the Serra Pelada miners in Brazil. "Migrations," a six-year project spanning some 40 countries that was completed in 1999, focused on migrants, refuges and other displaced populations that are financially and often physically vulnerable. (Both series became coffee-table books.)

A Getty Museum curator, Brett Abbott, who is including "Migrations" in his 2010 exhibition survey of narrative photojournalism, called this "epic approach" one of the Mr. Salgado's hallmarks: "Of all the photographers I'm looking at, he's probably taken on the biggest conceptual frameworks. He's always looking at global problems."

In this way "Genesis" represents less of a departure than it might at first seem. Even though he recently switched to a digital camera for large-format printing, his pictures have a consistent sensibility. He still generates contact sheets. He still likes to backlight his subjects, emphasizing — or romanticizing, his critics say — their forms. He still works in black and white. And his work still culminates in photo essays that, through a network of smaller stories, reveal something about an entire species. His fundamental subject is social systems, and now ecosystems.

His longtime gallerist, Peter Fetterman, also sees a strong through line in his career. While initially surprised by the turn to lush landscapes ("When I first saw the contact sheets, I thought maybe I was in the wrong studio, or the Ansel Adams archive"), he called Mr. Salgado's empathy for subjects an overarching trait. "Other photojournalists go in and out for a day," Mr. Fetterman said. "Sebastião goes and lives with his subjects for weeks before he even takes a picture."

Mr. Salgado also emphasizes the continuities between his various projects. “There is no difference photographing a pelican or an albatross and photographing a human being,” he said. “You must pay attention to them, spend time with them, respect their territory.” Even landscapes, he said, have their own personality and reward a certain amount of patience.

His goal for “Genesis” is to produce a total of 32 visual essays, which he hopes to display in major public parks as well as at various museums starting in 2012. “It’s my dream to show the work in Central Park, not in some building but outside among the trees,” he said.

So far financial support from the project has come from gallery sales and reproduction deals with magazines like Paris Match in France and Visão in Portugal. Two Bay Area foundations — Susie Tompkins Buell’s and the Christensen Fund — have lent support. Eventually, to raise money for printing, he plans to issue a limited edition of 20 platinum photographs, a first for Mr. Salgado, who is known for rather democratically printing as many pictures as there are orders.

That’s just one of the elements that makes “Genesis” seem like a legacy project: a veteran photojournalist’s carefully planned and well-meaning contribution to his children, grandchildren and the world at large. But he said he did not think it would not be his last. While admitting that he might not attempt another 500-mile hike over the Simien Mountains, he said he had no plans to retire any time soon.

“I don’t know any photographer who stopped working because he turned 70,” he said, adding that as a breed they tend to live a long time. He mentioned Henri Cartier-Bresson, who died at the age of 95, and Manuel Álvarez Bravo, who lived until 100.

“I was in Mexico City for Álvarez Bravo’s 100th-birthday celebration,” Mr. Salgado said. “He was sick, with his feet inside a tub of hot water, but he still had his camera. So he was photographing his feet.”

This article has been revised to reflect the following correction:

Correction: May 31, 2009

An article on Sunday about the photographer Sebastião Salgado refers to a benefit dinner thrown by actor Robin Williams. It was actually hosted by Marsha Williams, from whom the actor is currently separated.

http://www.nytimes.com/2009/05/31/arts/design/31fink.html?ref=design

Rendezvous on a Path With a French Artist

By JOAN DUPONT

WE revel in those operatic French movies about a famed artist — Camille Claudel, Édith Piaf — who on the way to glory spins out of control and meets a tragic end. "Séraphine," opening in New York on Friday, is a quiet film about an obscure artist, a country woman of the 1900s who worked as a maid. Séraphine Louis emptied chamber pots in the home of Wilhelm Uhde in the cathedral town of Senlis. A German critic and great collector of modern art, Uhde discovered her work and gave her a moment of recognition. She ended up in an insane asylum, lost and forgotten.

"Séraphine," directed by Martin Provost, stars the Belgian actress Yolande Moreau as the artist and the German actor Ulrich Tukur as the collector caught between warring countries and impulses. The surprise winner of this year's César awards (the French equivalent of the Oscars), it spurred a Séraphine revival: the movie and an exhibition of her paintings had extended runs in Paris.

Mr. Provost, 52, is a soft-spoken man, an actor who has done a stint at the Comédie-Française, a novelist, screenwriter and director who until last year was as obscure as his heroine. He said his discovery of the artist came at just the right time:

"One day a friend remarked, 'You should look into the life of Séraphine.' So I did and discovered a woman who suffered but transcended the taboos of the times to get to her art. She crossed my path just when I was at a dead end. In rehabilitating Séraphine I rehabilitated myself."

Séraphine of Senlis, as she was called, lived in the Île de France region, beyond the Seine valley where the Impressionists painted and not far from Giverny, where Monet lived. She was what was called an original, walking village roads, head bowed, in apron and clogs. Sent to work as a maid at 13, humiliated by her employers, she communed with nature in her free time, climbed trees, sang Gregorian chants, swam naked in the river. And she painted, filching candle wax from church to give luster to her colors.

As it happened, Mr. Provost lives in the region and heard that Ms. Moreau lived nearby.

A large woman with oblique sapphire eyes and a velvet voice, Ms. Moreau, 56, began as a mime, worked in children's theater and toured Belgium and France in her own one-woman show, "A Dirty Business of Sex and Crime." For years she performed in "Les Deschiens," Jérôme Deschamps's popular television comedy act.

In 2004 she wrote and directed, with Gilles Porte, "When the Sea Rises" ("Quand la Mer Monte"), a film in which she starred, inspired by her tour. It won a César for best first film and best actress.

"Even before I began writing the script," Mr. Provost said, "I knew that Yolande was the one — she was Séraphine. A great coincidence: the man who had restored my house had also worked on hers, so I asked him to put us in touch. Ten minutes later I was in her garden."
The encounter between Mr. Provost and Ms. Moreau, as they each tell it, echoes the relationship between Uhde and Séraphine, without the tragic edge.
"We worked together," he said, "exploring the subtle ties that bound those two. And we became close. Yolande never impersonates, she works from within. She brought a lot to the part. She lost weight so she could climb trees. We concentrated on small gestures, how to carry a chamber pot. She went to see a priest who taught her to sing in Latin, and we went to Senlis together, walked up the steps to Séraphine's home."
Ms. Moreau's own home is a treat to visit: a house in her image, open, with sudden angles and steep staircases. A pot of soup, made with pumpkin from the garden, is on the stove. Wearing a long apron cut just right, her russet curls trailing, she might have stepped out of a period film.
She does her writing in an annex, a vast windowed atelier piled with bric-a-brac: children's shoes, garden tools, seeds, plants, paintings, photos. One photo of a mustachioed man, her husband, looks like a relic from another age. Her gold César statuettes sit on a corner of the mantelpiece by other souvenirs, some bright, some faded, from recent films and what she calls her hippie past.
Talking about her approach to Séraphine, she described a kind of coexistence with the character, "une belle personne."
At the outbreak of World War I the collector and the painter lost touch. He was forced to return to Germany; when he came back to France, he didn't seek her out but assumed she must be dead. "This is the shadowy part of their story," Ms. Moreau said. "There was an attraction, a kind of love, between these two people from such different worlds — Uhde was homosexual, Séraphine was mystic, solitary. As an adolescent I was mystic and painted too. So my voyage to meet her brought back past emotions."
Ms. Moreau too was at a lull in her career the day Mr. Provost entered her life. "After 'When the Sea Rises' I didn't want to see anybody. I get that way. Martin walked into my house at the right moment. We'll work together again, and now that we know each other it will go faster. He's like me. He too needs his vegetable garden."
When Uhde returned to France from the war he exhibited some of Séraphine's paintings in Paris, next to Henri Rousseau's. She made money — she bought dresses, a grand house — and was promised a show devoted to her work.
"She got rid of that money fast," Ms. Moreau explained, "but when Uhde had to abandon the exhibit," because of financial woes, "she fell apart. We chose not to focus on the hysterical side of madness, just her suffering."
When Séraphine was interned, Uhde went to visit and left instructions for her comfort: a room of her own with a door leading out to the countryside. But he did not return, and she never painted again. "That was her choice," Ms. Moreau said, "she remained free, true to herself."

http://www.nytimes.com/2009/05/31/movies/31dupo.html?ref=design

'STAR TREK: THE EXHIBITION'
The U.S.S. Enterprise, in Strange New World of Museum

By EDWARD ROTHSTEIN

PHILADELPHIA — It is best to approach "Star Trek: The Exhibition" at the Franklin Institute here with phasers set to stun. And to avoid any quantum entanglement, make sure that if you visit the show before it closes on the stardate equivalent to Sept. 20, your transporter is in working order. Otherwise, there is just no telling the confusion that might result.

You might think, for example, that most starships of the 23rd and 24th centuries pretty much looked like the U.S.S. Enterprise in 2245 (Starfleet Registry NCC-1701; commanding officer, Capt. James T. Kirk). Or you might surmise, from the strange costumes in the opening gallery, that most biped alien life forms of that period had a funky taste in fashion, perhaps reacting against the ho-hum uniforms worn by Starfleet.
You might even suspect from the details of the Danish postmodern-nightclub-style Enterprise-D bridge (where you can sit in the seat in which Capt. Jean-Luc Picard directed his Galaxy-class ship), that seat belts weren't needed under impulse or warp travel (perhaps because of the "inertial dampers"?) and that the control lights for the "plasma induction analysis" were just for show, so advanced was the technology.
And you might believe that the Sick Bay, transported here from Deck 12 of the Enterprise, was so sophisticated a medical facility that it did not need much more than the rudimentary models of the Tricorder, the Hypospray and the Osmosis Module displayed here.
You might, in other words, start to mistake this as an exhibition of real objects, even though on some the labels read not "prop" but "replica of a prop." And while the show's Teacher's Guide promises "your students will learn about an alien time portal, known as the Guardian of Forever," the careful reader of the display text will suspect that perhaps that portal, the bloody Dominion War of 2374-75 (or thereabouts) and the NX-74205 (an experimental starship designed "to help meet the threat of a Borg invasion") are all purely imaginary.
That is, of course, just what they are, like the 700-some hours of television shows and 11 feature films that began in 1966 with Gene Roddenberry's original series. In fact, the latest "Star Trek" movie, which has grossed more than $280 million internationally since its release this month and has inspired the Franklin to mount this exhibition while screening the film in its Imax theater, leaves open a wormhole as wide as a starship to expand the franchise. Since the movie circles back to the beginning of the saga while offering the promise of alternate histories, the entire epic might well be retold in coming years as if from the perspective of a parallel universe.
In the meantime this show — with "Star Trek" costumes, replicas of props and models of a Borg, a Cardassian and other aliens, as well as the opportunity to sit in the original Kirk's command seat (yes, his too) — must provide that parallel universe for visiting Trekkies. (Or Trekkers, as they prefer to be called.) But it pays tribute to fantasy with fantasy: it imagines that in spreading out these artifacts over 12,500 square feet, it is creating something more than a promotional space for the franchise. The Franklin tries to edge a little closer to its mission as a science museum by punctuating the show with explanatory panels that give some glimpse into (a) the real history of space exploration and (b) the science behind the fiction. The problem is that when you are in the midst of comparing different models of starships or matter/anti-matter drives, and imagining time travel or warp speed, it's a bit jarring to suddenly see a description of the Sputnik program, or read about President John F. Kennedy's message to Congress in 1961 about sending a man to the moon.

The primitive history of the American space program almost turns comical in contrast. At the same time, the "Star Trek" universe's imagining of this fantastical future can itself seem quaint. Current hand-held electronics are far more impressive than the Starfleet wrist communicators on display.
As for the science behind the series, the occasional text panel is unavoidably dispiriting, pointing out, for example, the nature of the distances being cavalierly played with. (Our Sun is about 25,000 light years from the center of our galaxy, which means that it would take 25 millenniums for a light beam to traverse it.) Or recounting the obstacles to be overcome before a transporter could be built, turning matter into energy, beaming it to a distant place and transforming it back into matter.
What would this exhibition have been like had it been more serious about its sense of play? More true to itself than to the trademarked Starfleet Command? One textual note here cites a fine book written almost 15 years ago by the physicist Lawrence M. Krauss, "The Physics of Star Trek." By patiently and clearly explaining principles of, say, Newton's laws of motion and Einstein's general theory of relativity, Mr. Krauss outlines just where the shows have misunderstood the science, and where they have made plausible use of it. As Scotty often says, "Ya canna change the laws of physics, Cap'n."
A science museum's exhibition about "Star Trek" might have done something similar to Mr. Krauss's book: discussed inertia, perhaps, and the way the series tries to work around it, or examined what was involved in "warp" speed and the bending of space, or traced just how much imagination was used in constructing the "Star Trek" universe. That might have helped explain, too, why so many scientists have found inspiration in the galactic adventures.
Or the exhibition might have done what its Teacher's Guide does for older students, and touched on some of the social themes raised by the series: the nature of exploration, the character of parasites, the idea of cultural diversity. With such contexts, even the props would have become more interesting.
The reason for the popularity of "Star Trek," after all, is not in its objects, but in boldly going where science-fiction writers have often gone before: creating thought experiments in which humanity is the subject.
In its early years the series's narrative drive came from the passions of the mid-1960s. It tapped into the utopian dreams of nascent space travel, along with utopian passions of countercultural liberalism. Like a war novel, it has a multi-ethnic troop bound together by a task, only here the mission is a celebration of cultural relativism and tolerant exploration. The Federation refuses to impose its values on alien races. There is a spirit of American exceptionalism on the bridge of the Enterprise, where a community of immigrant individuality takes shape, spreading the gospel of liberal understanding.
But there are flaws in that proposition, the crew keeps discovering. There are cultures that seek the destruction of others, desires that disrupt harmonious ambitions, powers that render virtue powerless. So at the very height of the counterculture, the original series both championed, and dissented from, that movement's peaceful, anti-militaristic vision. Kirk, after all, is an iconoclastic military leader, the Enterprise is often in combat, and best intentions are often stymied by the need to fight. Kirk and Mr. Spock are themselves opposing archetypes, doomed to conflict and difference.
Both poles forge an uneasy coexistence, sometimes leaving behind a message that verges on pap, sometimes suggesting something more uncertain. In the latest movie the young Kirk is seen as a rebel without a cause who learns something about the discipline of command.
As for the exhibition, it is a short-lived life form, perhaps a creation of the aliens known as Ferengi, who, whatever they did, were in it mainly for the dough.
"Star Trek: The Exhibition" continues through Sept. 20 at the Franklin Institute, 222 North 20th Street, Philadelphia; (215) 448-1200, fi.edu.

http://www.nytimes.com/2009/05/30/arts/design/30star.html?ref=design

CAMILO JOSÉ VERGARA
Harlem in Time-Lapse Photography

By HOLLAND COTTER

From the time he arrived in the United States from Chile as a college student in 1965, the photographer Camilo José Vergara has been haunting, and haunted by, American cities.

He lives in New York but has spent the better part of the past four decades in Baltimore, Chicago, Detroit and Los Angeles, urban centers with big, poor, largely segregated minority neighborhoods. He has also frequented smaller, fallen-apart industrial cities like Camden, N.J., and Gary, Ind., places he calls "permanent ghettos."

By his own estimate he has returned to Gary more than a hundred times.
On each visit he has done the same thing: take pictures, mostly of buildings, often the same ones, recording over decades their abandonment, disintegration, demolition and replacement by cheaper structures, or parking lots, or by nothing at all
.
This vigilance has produced several books, among them two great, generative visual essays in architectural anthropology, "The New American Ghetto" (1995) and "American Ruins" (1999), and exhibitions like "Harlem, 1970-2009: Photographs by Camilo José Vergara" now at the New-York Historical Society.

His self-created job as documenter is demanding. It can require the fearlessness of a reporter in a war zone and the solicitous detachment of a doctor doing rounds, though Mr. Vergara doesn't claim these qualities. He has said in interviews that he goes where he goes and does what he does because he needs to.
Focusing on images of constant material change distracts him from anxieties, transports him back to the decaying, now disappeared world of his childhood, and connects him empathetically to an American culture from which he otherwise feels removed. Far from being a brash photographic adventurer, he is more like a ghost haunting ghosts.

The ghosts are unusually vivacious in the 100 pictures of Harlem at the New-York Historical Society. Mr. Vergara first visited that neighborhood soon after he arrived in New York in 1968, at the age of 24. Urban poverty and ill-conceived urban renewal had already done irreparable damage. New York was jittery with change. He started taking pictures.
At the time he was exploring a genre broadly known as street photography. (Helen Levitt was an artist he particularly admired. An exhibition of her work at Laurence Miller Gallery is reviewed on Page 29.) And the earliest pictures in the historical society exhibition are shots of people going about their lives on Harlem sidewalks: black children playing with white Barbies on a stoop, a nervous wedding party gathered in front of a church.
Although tied down by a Midtown desk job, Mr. Vergara returned regularly to Harlem on his lunch hours, establishing a repeat-visit pattern that would lead to time-lapse architectural sequences stretching over years.
In 1977 he photographed the exotic-looking exterior of a nightclub-bar called the Purple Manor at 65 East 125th Street, the wide facade, with sets of double doors, painted a very 1970s lavender; the windows, fitted with decorative paper borders, had a jazzy hourglass shape. The club's clientele was reputed to move in upper levels of the drug trade.
By 1980 much had changed. In a picture Mr. Vergara took that year, the bar is gone and its premises divided into two small storefronts painted different colors: the one on the left baby blue, the one on the right fire-engine red. Over several years the storefronts also took on different functions, each of which Mr. Vergara photographed.
In 1980 the left-hand storefront was a fish-and-chips shop, a year later a discount variety store. After an initial lag in activity, the storefront on the right began selling women's clothes before turning into a smoke shop, an identity it retained for some years, even as its neighbor morphed from furniture store to unisex boutique to beauty salon, with superficial alterations at each change.
Both stores hit hard times in the recession-plagued 1990s. The facades are marked up, the sidewalk cluttered. Then in 2004 the two stores were reunited to accommodate a Sleepy's mattress showroom. But within a few years that franchise moved on. In 2008 the space that had been the Purple Manor 30 years earlier was plate-glass-fronted, accessible to the disabled, and for rent.
Mr. Vergara takes us through all these dramatic shifts in function, fashion and fortune with an attitude of studied neutrality. He shoots storefronts always straight on, from the same distance, in unmoody light. The results are urban photography as archaeological field work. Over the span of eight images we see many changes, but we aren't asked to feel good or bad about them. We're meant to think: Look what life does.

By contrast an unmistakably elegiac current flows through Mr. Vergara's single pictures of Harlem architecture. The Renaissance Ballroom and Casino on West 137th Street, built in the 1920s as a showcase for performers like Count Basie and Duke Ellington, is now a moldering pile. A 19th-century fire watchtower in Marcus Garvey Park, the only surviving example of its kind, looks rickety and vulnerable.

A group of buildings on Madison Avenue near 127th Street that Mr. Vergara shot in 1982 is, we learn from his terse wall label, long gone. "There is now an empty lot in this space."
And yet, however ambivalently, an upbeat note comes through. Harlem is, after all, an economic success story. Old town houses, once derelict, are being preserved. Tenements abandoned in the 1990s have been rehabilitated. Churches are flourishing. Storefronts have paying occupants.

That the occupants may be McDonald's and Kentucky Fried Chicken, and that portions of 125th Street are now corporate-brand shopping malls, may not be unalloyed good news. But the neighborhood around them suggests a degree of material security that its equivalents in Camden, Detroit and Gary can, at this point, not even dream of.

The show's true source of warmth, though, lies in the unusually high number — for Mr. Vergara — of pictures of people, of a kind that bring him full circle to the street photographer he was 40 years ago. He made some wonderful portraits back then: one of a Bolivian Indian in traditional clothes in East Harlem in 1970 is in the show. And he's making some beauties now, as in his 2008 picture of the street

evangelist Pierre Gaspar, known as the Hallelujah Man, and a 2009 shot of a man and child walking past billboard-size portraits of Malcolm X and Barack Obama on West 125th Street.
But in portraits, as in architectural pictures, time marches on. A man wearing overalls poses for the camera in what looks like a densely planted sunlit field. The year is 1990. From a wall label we learn that the man's name was Eddie; that he was originally from Selma, Ala.; and that he farmed an empty lot on Frederick Douglass Boulevard between 118th and 119th Streets. We further learn that today, almost two decades later, a luxury apartment occupies the lot and "a Starbucks has opened on the exact spot where Eddie stands."
In "American Ruins" Mr. Vergara lists works of art in various mediums that have influenced him deeply. He mentions the photographs of Levitt, Eugène Atget and Walker Evans. From literature he cites the death-obsessed novels of Dostoyevsky and the apparition-filled stories of that connoisseur of decay, Edgar Allan Poe.

Miles Davis, Mahler and the British composer John Dowland, who wrote his sad songs of longing from exile in France, are on the list. Among artists, he singles out Piranesi, the Dutch landscapist Jacob van Ruisdael, and Claude Monet, particularly Monet's images of Rouen Cathedral with its facade disintegrating into light.

The reason for Mr. Vergara's attraction to Ruisdael — painter of crumbling towers, castles and cemeteries — seems obvious. And he specifically likens Piranesi's vast, hollow, exitless prisons to the bombed-out American cities in which he has spent so many years. He makes no direct connection between Monet's spectral cathedral — is it falling down or coming together? — and the facades morphing, dying and resurrecting in the Harlem photographs, but I think he could.

"Harlem, 1970-2009: Photographs by Camilo José Vergara" is at the New-York Historical Society, 170 Central Park West, through July 12. "Storefront Churches: Photographs by Camilo José Vergara" opens at the National Building Museum in Washington on June 20.

http://www.nytimes.com/2009/05/29/arts/design/29verg.html?ref=design

YANG FUDONG
From an Ancient Bamboo Grove to Modern China

By KEN JOHNSON

The celebrated filmmaker Yang Fudong, who was born in 1971 and lives in Shanghai, is having a New York moment. His best-known work, a beautiful but tryingly long, slow and portentous series of movies called "Seven Intellectuals in a Bamboo Forest" (2003-7), is on view in its five-hour entirety for the first time in a United States museum (at the Asia Society).

Meanwhile, Marian Goodman Gallery is presenting Mr. Yang's "East of Que Village" (2007), a kind of gritty, anthropological study shown as six simultaneously running videos. Seen together, these exhibitions afford a supremely stylish and at times frustratingly narrow glimpse into the collective soul of modern China.

The two projects are similar in some ways. Both are in black and white and proceed with no regard for linear narrative. In terms of subject matter, however, they are worlds apart.

In its snail's pace, emotional muteness and velvety grain, "Seven Intellectuals," which was featured at the 2007 Venice Biennale, calls to mind early films by Jim Jarmusch, whom Mr. Yang has credited as an inspiration. Mr. Yang is often a striking image maker, but he has none of Mr. Jarmusch's zany humor and storytelling imagination. He has also been influenced by the French New Wave.

But his movies, which tend to be wordless, are more pictorial than cinematic. Trained as a painter and photographer, he creates sequences of images that are like perfectly composed Modernist photographs. Often the imagery plays on classical Chinese paintings as well.

Inspired by a story about some third-century Taoists who retreat from the corruption of urban life and government service to a bamboo grove for conversation, singing and drinking, "Seven Intellectuals" tracks the dreamlike meanderings of a group of morose, well-dressed, fashion-model-pretty young people (five men and two women). We first encounter them reclining in the nude on a rocky outcrop on Yellow Mountain in Anhui Province. Then we follow them to a claustrophobic city apartment, where romantic and sexual complications ensue, and then to a beach where they process dried fish and wander over oceanside rocks carrying suitcases.

The last and longest segment has them in a big city, where Mr. Yang's disjunctive imagery becomes increasingly surrealistic. Though usually dressed to resemble mid-20th-century French philosophers, Mr. Yang's seven intellectuals look more like graduate students than serious thinkers, and they seem to be without solid foundations of selfhood.

In Part 3, as if to atone for their rootless self-absorption, they take up mountainside rice farming. Barefoot and in peasant clothes, they churn flooded paddies with a rudimentary, ox-drawn plow; build dikes of mud with hoes and pitchforks; and plant seedlings. Like Marie Antoinette and her fellow mock-shepherds, and like American hippies who escaped to rustic communes in the 1960s, these intellectuals indulge in the fantasy of a more wholesome lifestyle and greater intimacy with nature. Of course, it doesn't last; that kind of life is too hard. Eventually they descend from their high-minded privations to the moral confusion of city life.

Going from the earlier project to the documentary video "East of Que Village," it looks as if Mr. Yang were doing Social Realist penance for his prior infatuation with privileged youth. Running concurrently on six high-definition flat screens in a dark room, each 20-minute video shows shifting views of a remote village in a region surrounding Beijing. In the desolate landscape outside the village, scrawny dogs forage for food and get into snarling fights. In town we see people doing routine activities. At one point they enjoy an outdoor performance of screechy folk music and a communal parade.

The video suite is not overtly message-driven. Mr. Yang's minimalist style works as a gaze of all-over, noncommittal attentiveness. By showing six channels simultaneously, he creates an enveloping experience, which is enhanced by the sounds of barking and growling, blaring music and other ambient noises.

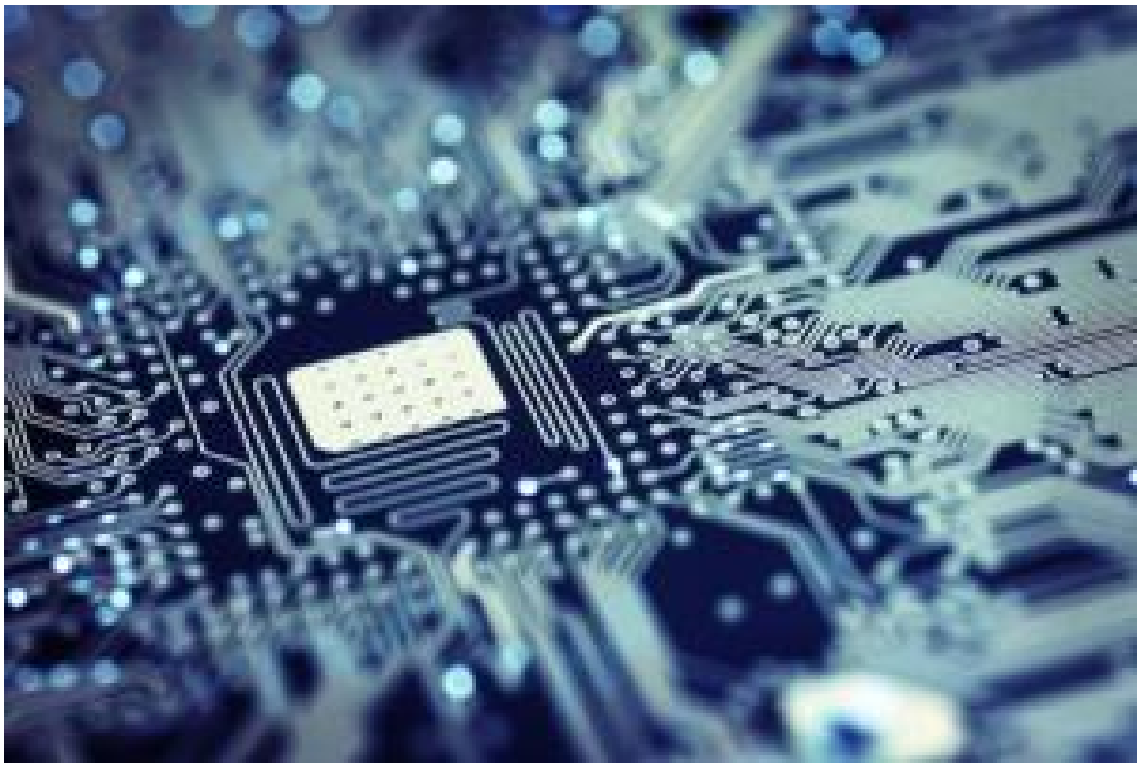
In their reticence, Mr. Yang's films border on pure and nearly static formalism. (He makes "Last Year at Marienbad" seem like an action film.) Nevertheless, they are richly allusive. You can read "East of Que Village" as an allegory of life on the fine line between civilization and savagery. The title, by the way, refers to the direction of the only road leading to the outside world.

Viewed against a backdrop of recent Chinese history — the decline of Maoism, the rise of capitalism, the accelerated importation of Western art and culture — both films exude a mournful ennui that is the opposite of go-go modernity. Welcome to China. Here are the educated classes who aspire to the intellectual and material rewards of modern, global culture, but risk losing their traditional sources of identity and spiritual energy. And there are worlds where life is unforgiving, and death is always near at hand. The future seems bleak.

"Seven Intellectuals in a Bamboo Forest" is on view through Sept. 13 at the Asia Society, 725 Park Avenue, at 70th Street; (212) 288-6400, asiasociety.org. "East of Que Village" continues through June 20 at the Marian Goodman Gallery, 24 West 57th Street, Manhattan; (212) 977-7160, mariangoodman.com.

http://www.nytimes.com/2009/05/29/arts/design/29yang.html?ref=design

Scientists Engineer Cellular Circuits That Count Events



Researchers have designed cells that can count and "remember" cellular events, using simple circuits that mimic those found on computer chips (such as the one shown above). (Credit: iStockphoto)

ScienceDaily (May 31, 2009) — MIT and Boston University engineers have designed cells that can count and "remember" cellular events, using simple circuits in which a series of genes are activated in a specific order.

Such circuits, which mimic those found on computer chips, could be used to count the number of times a cell divides, or to study a sequence of developmental stages. They could also serve as biosensors that count exposures to different toxins.

The team developed two types of cellular counters, both described in the May 29 issue of *Science*. Though the cellular circuits resemble computer circuits, the researchers are not trying to create tiny living computers.

"I don't think computational circuits in biology will ever match what we can do with a computer," said Timothy Lu, a graduate student in the Harvard-MIT Division of Health Sciences and Technology (HST) and one of two lead authors of the paper.

Performing very elaborate computing inside cells would be extremely difficult because living cells are much harder to control than silicon chips. Instead, the researchers are focusing on designing small circuit components to accomplish specific tasks.

"Our goal is to build simple design tools that perform some aspect of cellular function," said Lu.

Ari Friedland, a graduate student at Boston University, is also a lead author of the *Science* paper. Other authors are Xiao Wang, postdoctoral associate at BU; David Shi, BU undergraduate; George Church,

faculty member at Harvard Medical School and HST; and James Collins, professor of biomedical engineering at BU.

Learning to count

To demonstrate their concept, the team built circuits that count up to three cellular events, but in theory, the counters could go much higher.

The first counter, dubbed the RTC (Riboregulated Transcriptional Cascade) Counter, consists of a series of genes, each of which produces a protein that activates the next gene in the sequence.

With the first stimulus — for example, an influx of sugar into the cell — the cell produces the first protein in the sequence, an RNA polymerase (an enzyme that controls transcription of another gene). During the second influx, the first RNA polymerase initiates production of the second protein, a different RNA polymerase.

The number of steps in the sequence is, in theory, limited only by the number of distinct bacterial RNA polymerases. "Our goal is to use a library of these genes to create larger and larger cascades," said Lu.

The counter's timescale is minutes or hours, making it suitable for keeping track of cell divisions. Such a counter would be potentially useful in studies of aging.

The RTC Counter can be "reset" to start counting the same series over again, but it has no way to "remember" what it has counted. The team's second counter, called the DIC (DNA Invertase Cascade) Counter, can encode digital memory, storing a series of "bits" of information.

The process relies on an enzyme known as invertase, which chops out a specific section of double-stranded DNA, flips it over and re-inserts it, altering the sequence in a predictable way.

The DIC Counter consists of a series of DNA sequences. Each sequence includes a gene for a different invertase enzyme. When the first activation occurs, the first invertase gene is transcribed and assembled. It then binds the DNA and flips it over, ending its own transcription and setting up the gene for the second invertase to be transcribed next.

When the second stimulus is received, the cycle repeats: The second invertase is produced, then flips the DNA, setting up the third invertase gene for transcription. The output of the system can be determined when an output gene, such as the gene for green fluorescent protein, is inserted into the cascade and is produced after a certain number of inputs or by sequencing the cell's DNA.

This circuit could in theory go up to 100 steps (the number of different invertases that have been identified). Because it tracks a specific sequence of stimuli, such a counter could be useful for studying the unfolding of events that occur during embryonic development, said Lu.

Other potential applications include programming cells to act as environmental sensors for pollutants such as arsenic. Engineers would also be able to specify the length of time an input needs to be present to be counted, and the length of time that can fall between two inputs so they are counted as two events instead of one.

They could also design the cells to die after a certain number of cell divisions or night-day cycles.

"There's a lot of concern about engineered organisms — if you put them in the environment, what will happen?" said Collins, who is also a Howard Hughes Medical Institute investigator. These counters "could serve as a programmed expiration date for engineered organisms."

The research was funded by the National Institute of Health Director's Pioneer Award Program, the National Science Foundation FIBR program, and the Howard Hughes Medical Institute.

Journal reference:

1. Ari E. Friedland, Timothy K. Lu, Xiao Wang, David Shi, George Church, and James J. Collins. **Synthetic Gene Networks That Count**. *Science*, 2009; 324 (5931): 1199 DOI: 10.1126/science.1172005

Adapted from materials provided by Massachusetts Institute of Technology.

http://www.sciencedaily.com/releases/2009/05/090528142823.htm

Ancient Volcanic Eruptions Caused Global Mass Extinction

Researchers believe they have uncovered evidence of a giant volcanic eruption that led to global mass extinction 260 million years ago. (Credit: iStockphoto/James Steidl)

ScienceDaily (May 30, 2009) — A previously unknown giant volcanic eruption that led to global mass extinction 260 million years ago has been uncovered by scientists at the University of Leeds.

The eruption in the Emeishan province of south-west China unleashed around half a million cubic kilometres of lava, covering an area 5 times the size of Wales, and wiping out marine life around the world.

Unusually, scientists were able to pinpoint the exact timing of the eruption and directly link it to a mass extinction event in the study published in *Science*. This is because the eruptions occurred in a shallow sea – meaning that the lava appears today as a distinctive layer of igneous rock sandwiched between layers of sedimentary rock containing easily datable fossilised marine life.

The layer of fossilised rock directly after the eruption shows mass extinction of different life forms, clearly linking the onset of the eruptions with a major environmental catastrophe.

The global effect of the eruption is also due to the proximity of the volcano to a shallow sea. The collision of fast flowing lava with shallow sea water caused a violent explosion at the start of the eruptions – throwing huge quantities of sulphur dioxide into the stratosphere.

"When fast flowing, low viscosity magma meets shallow sea it's like throwing water into a chip pan – there's spectacular explosion producing gigantic clouds of steam," explains Professor Paul Wignall, a palaeontologist at the University of Leeds, and the lead author of the paper.

The injection of sulphur dioxide into the atmosphere would have lead to massive cloud formation spreading around the world - cooling the planet and ultimately resulting in a torrent of acid rain. Scientists estimate from the fossil record that the environmental disaster happened at the start of the eruption.

"The abrupt extinction of marine life we can clearly see in the fossil record firmly links giant volcanic eruptions with global environmental catastrophe, a correlation that has often been controversial," adds Professor Wignall.

Previous studies have linked increased carbon dioxide produced by volcanic eruptions with mass extinctions. However, because of the very long term warming effect that occurs with increased atmospheric carbon dioxide (as we see with current climate change) the causal link between global environmental changes and volcanic eruptions has been hard to confirm.

This work was done in collaboration with the Chinese University of Geosciences in Wuhan and funded by a grant from the Natural Environment Research Council, UK.

Journal reference:

1. Paul B. Wignall, Yadong Sun, David P. G. Bond, Gareth Izon, Robert J. Newton, Stéphanie Védrine, Mike Widdowson, Jason R. Ali, Xulong Lai, Haishui Jiang, Helen Cope, and Simon H. Bottrell. **Precise coincidence of explosive volcanism, mass extinction and carbon isotope fluctuations in the Middle Permian of China**. *Science*, 2009; DOI: 10.1126/science.1171956

Adapted from materials provided by University of Leeds.

http://www.sciencedaily.com/releases/2009/05/090528142827.htm

Child diabetes cases 'to double'

The number of under-fives in Europe with type 1 diabetes is set to double between 2005 and 2020, say experts.

The researchers, from Ireland and Hungary, warn cases in older children will also rise substantially.

Writing in The Lancet, they say genetics alone cannot account for the rapid rise, and suggest lifestyle factors are likely to play a role.

The study is based on 29,311 cases of type 1 diabetes recorded in 20 European countries between 1989 and 2003.

" **A lot more research is needed before we can come to any concrete conclusions about the causes of this rise in type 1 diabetes in younger children** "
Dr Iain Frame Diabetes UK

Type 1 diabetes is caused by insulin deficiency, and must be treated with regular injections of the hormone.

In the general population it accounts for only 10% of total diabetes cases, but is much more common than the type 2 version in children.

The researchers, from Queen's University, Belfast, and Pecs University, Hungary, found the overall incidence of type 1 diabetes rose by 3.9% per year.

However, among the under-fives it was 5.4% per year, and in the five to nine age group it was 4.3% per year.

They calculated that, on present trends, 24,400 new cases will be diagnosed in children under 15 in 2020, including 7,142 cases in the under-fives.

The total number of cases of type 1 diabetes among European children under 15 is predicted to rise from 93,584 in 2005 to 159,767 in 2020 - a 70% increase.

Among the under-fives, the total number of cases is predicted to double, from 9,955 in 2005 to 20,113 in 2020.

In the UK, where type 1 diabetes appears to be more common than elsewhere in Europe, the predicted rises are bigger still.

The researchers predict the total number of cases in the under-15s will rise by nearly 80% from 18,622 in 2005 to 33,289 in 2020.

And among the under-fives, they expect to see a 123% rise, from 1,975 in 2005 to 4,402 in 2020.

Lifestyle factors

The researchers say the increase in type 1 diabetes has been so rapid that it cannot be blamed on genetic factors alone.

DIABETES

 Type 1: Beta cells of the pancreas no longer make the hormone insulin because the body's immune system has attacked and destroyed them. Treatment includes taking insulin and possibly another injectable medicine
 Type 2: Usually develops later in life. Often linked to lifestyle factors, such as obesity. Occurs when the pancreas does not produce enough insulin to meet the body's needs or the insulin is not used effectively by the body's cells. Usually treated by diet and exercise.

They also point out that the highest increases have been seen in Eastern Europe, where lifestyle habits are changing more rapidly than in richer Western European nations.

Researcher Dr Chris Patterson said: "The children of older mums are at slightly increased risk of type 1 diabetes as are children born by Caesarean section and children with rapid weight gain early in life, while breast-fed children are at slightly decreased risk.

"Infections and viruses may also play a role. But currently none of these risk factors can be said to be responsible for the increase, the cause of which remains largely unknown."

The researchers warn that it is likely that hospitals will see more patients with severe diabetes complications presenting at a younger age.

These can include the potentially life-threatening condition ketoacidosis, in which the acidity of the blood is raised by the unregulated breakdown of fats and proteins by the liver.

Not only do young children with type 1 diabetes tend to be diagnosed late, and so have a higher risk of complications, they potentially face a lifetime of problems - bad news for them, and for the health care systems who must look after them.

Writing in the journal, the researchers said: "In the absence of any effective means to prevent type 1 diabetes, European countries need to ensure appropriate planning of services and that resources are in place to provide high-quality care for the increased numbers of children who will be diagnosed with diabetes in future years."

Dr Iain Frame, director of research at the charity Diabetes UK, described the research as "worrying".

"Many people live full and healthy lives, however, the longer the person has diabetes the higher the risk of complications such as heart disease, kidney failure and blindness.

"However, a lot more research is needed before we can come to any concrete conclusions about the causes of this rise in type 1 diabetes in younger children."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8068941.stm

Published: 2009/05/27 23:34:44 GMT

Routine aspirin benefits queried

Low-dose aspirin should not routinely be used to prevent heart attacks and strokes, contrary to official guidance, say UK researchers.

Analysis of data from over 100,000 clinical trial participants found the risk of harm largely cancelled out the benefits of taking the drug.

Only those who have already had a heart attack or stroke should be advised to take a daily aspirin, they found.

The Lancet study should help clarify a "confusing" issue, GPs said.

The NHS drugs watchdog, the National Institute for health and Clinical Excellence (NICE), has not made a ruling in this area.

But experts in the UK, US and Europe recommend aspirin for people who have not already had a heart attack or stroke, but are at high risk of cardiovascular disease because of factors such as age, blood pressure and cholesterol level.

" **We don't have good evidence that, for healthy people, the benefits of long-term aspirin exceed the risks by an appropriate margin** "
Professor Colin Baigent, study leader

This strategy, known as primary prevention, is based on the result of studies looking at predicted risks and benefits in this population.

But the latest research provides clearer evidence because it is based on data from individuals, the researchers said.

They looked at heart attacks and strokes and major bleeds - a potential side effect of aspirin - in six primary prevention trials, involving 95,000 people at low to average risk and 16 trials involving 17,000 people at high risk - because they had already had a heart attack or stroke.

Use of aspirin in the lower-risk group was found to reduce non-fatal heart attacks by around a fifth, with no difference in the risk of stroke or deaths from vascular causes.

But it also increased the risk of internal bleeding by around a third.

Balance

However, in those patients who had already had a heart attack or stroke and were at risk of having another, the benefits clearly outweighed the chance of adverse events, the researchers said.

Study leader Professor Colin Baigent from the Clinical Trial Service Unit at the University of Oxford, UK, said drug safety was vital when making recommendations that affected tens of millions of healthy people.

"We don't have good evidence that, for healthy people, the benefits of long-term aspirin exceed the risks by an appropriate margin."

He added: "I think the guideline groups will find it useful to have the data analysed in that way."

Professor Steve Field, chair of the Royal College of GPs, said the issue had been confusing for GPs and patients.

"There is no definitive guidance and it makes it bewildering when you have a series of papers which then hint it would be beneficial to take aspirin."

He added that many patients would buy aspirin over the counter - either on the advice of their GP or under their own steam - because it was cheap.

"This important study does suggest people shouldn't take aspirin unless indicated by disease."

Ellen Mason, senior cardiac nurse at the British Heart Foundation said: "It is better for doctors to weigh up the benefit and risk of prescribing aspirin on an individual basis, rather than develop a blanket guideline suggesting everyone at risk of heart disease is routinely given aspirin."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8072215.stm

Published: 2009/05/28 23:11:43 GMT

Malaria parasites 'resist drugs'

International scientists say they have found the first evidence of resistance to the world's most effective drug for treating malaria.

They say the trend in western Cambodia has to be urgently contained because full-blown resistance would be a global health catastrophe.

Drugs are taking longer to clear blood of malaria parasites than before.

This is an early warning sign of emerging resistance to a disease which kills a million people every year.

Until now the most effective drug cleared all malaria parasites from the blood within two or three days but in recent trials this took up to four or five days.

The BBC's Jill McGivering, reporting from Cambodia, says it is unclear why the region has become a nursery for the resistance - but the local public health system is weak, and the use of anti-malaria drugs is not properly controlled.

Drug defence

The artemesinin family of drugs is the world's front-line defence against the most prevalent and deadly form of malaria.

Two teams of scientists, working on separate clinical trials, have reported seeing the disturbing evidence that the drugs are becoming much less effective.

There is particular concern because previous generations of malaria drugs have been undermined by resistance which started in this way, in this part of the world, our correspondent reports.

The World Health Organization warned in 2006 there was a possibility the malaria parasite could develop a resistance to artemesinin drugs, and that there was particular concern about a decreased sensitivity to the drug being seen in South East Asia.

It urged drug firms to stop selling artemesinin on its own in order to prevent resistance building up.

Early results from two studies by US and UK teams have both revealed the early stages of resistance.

Between a third and a half of patients in the US study saw delayed clearance of the malaria parasite.

In the UK study, patients in the Cambodia arm of the trial took almost twice as long to clear the parasite as a comparison group in Thailand.

Professor Nick Day, director of the Mahidol-Oxford Tropical Medicine Research Unit which is carrying out the UK study, said: "Twice in the past, South East Asia has made a gift, unwittingly, of drug resistant parasites to the rest of the world, in particular to Africa," he said.

"That's the problem. We've had chloroquine and SP (sulfadoxine pyrimethamine) resistance, both of which have caused major loss of life in Africa," he said in reference to earlier generation anti-malarial drugs.

"If the same thing happens again, the spread of a resistant parasite from Asia to Africa, that will have devastating consequences for malaria control," he said.

Prof Brian Greenwood, Professor of Tropical Medicine at the London School of Hygiene and Tropical Medicine, described the findings as a matter for concern, even though treatment still worked if a full course of artemisinin combination therapy (ACT) was taken.

"There is currently no need for panic but it would be serious if these partially resistant parasites reached Africa where great gains in malaria control are currently being made using ACTs and insecticide-treated bed nets," he said.

Health systems

Cambodia has long been a laboratory for malaria investigators and a nursery of anti-malaria drug resistance.

Alongside a weak public health system and poorly-controlled drug use, there are many fake drugs, produced by international criminals.

These fakes often contain a small amount of the real drug to fool tests, which can also help to fuel resistance.

Those working to control malaria are calling for urgent action to contain this emerging resistance.

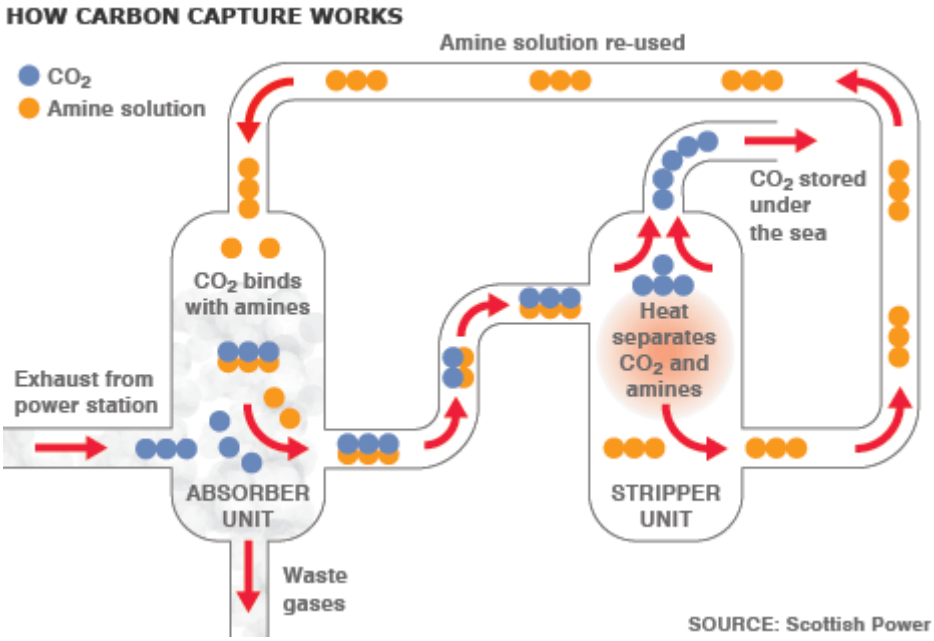
If it strengthens and spreads, they warn, many millions of lives will be at risk. About half the world's population faces exposure to the disease.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/asia-pacific/8073118.stm

Published: 2009/05/29 03:36:25 GMT

Carbon capture technology tested

New carbon capture technology is being tested for the first time in the UK on a working coal-fired power station.



A 30-tonne test unit will process 1,000 cubic metres of exhaust gas per hour from Longannet power station in Fife.

Carbon dioxide will be removed using chemicals and turned into a liquid, ready for storage underground.

Energy company ScottishPower wants to test technology which could lead to a full scale carbon capture plant becoming operational by 2014.

The UK government recently gave the go-ahead for a new generation of coal-fired power stations provided they were able to limit their CO2 emissions.

The scientists have focussed on the post-combustion method of carbon capture and storage (CCS) which aims to trap greenhouse emissions after fossil fuels have been burnt.

The plant, developed by Aker Clean Carbon, will enable them to assess the effectiveness of chemicals, known as amines, at removing CO2.

Researchers from the University of Edinburgh will join the project, testing three different types of amine solution over the next three months.

" **We believe that the UK can lead the world with CCS technology, creating new skills, jobs and opportunities for growth** "
Ignacio Galan Chairman, Iberdrola

ScottishPower chief executive Nick Horler said: "This is the first time that CCS technology has been switched on and working at an operational coal-fired power station in the UK.

"It's a major step forward in delivering the reality of carbon-free fossil fuel electricity generation."

ScottishPower's parent company Iberdrola said the UK would be its global centre of excellence for CCS development, bringing together academics, industry experts and engineers.

A professorship of CCS will be based at Edinburgh University, but other academic institutions will also be involved including Imperial College, London.

Iberdrola Chairman Ignacio Galan said: "We believe that the UK can lead the world with CCS technology, creating new skills, jobs and opportunities for growth.

"There is the potential to create an industry on the same scale as North Sea Oil, and we will invest in Scotland and the UK to help to realise this potential."

The Longannet power station opened in 1969 and is the second largest in the UK.

The station chimney is 183m tall, the second highest free-standing structure in Scotland.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/scotland/edinburgh_and_east/8072583.stm

Published: 2009/05/29 08:51:30 GMT

Beavers return after 400-year gap

A total of 11 beavers have been released into the wild in Argyll as part of a reintroduction programme.

Four more may join the Scottish Beaver Trial being run in Knapdale Forest.

The beavers have been brought to Scotland from Norway and their release marks a return to the UK after a 400-year absence.

The release will be studied to determine whether the trial should be extended and beavers reintroduced across Scotland.

The Scottish Beaver Trial (SBT) is being carried out by the Scottish Wildlife Trust and the Royal Zoological Society of Scotland.

Project manager Simon Jones said the release of the beaver families on Friday "went extremely well".

"They were placed into purpose-built artificial lodges at carefully selected points around the trial site," he said.

"They will now gradually gnaw their way out of the lodge at a pace that is comfortable for them before exploring their new surroundings."

Mr Jones said that following the release, the "real work" of the trial could now begin.

He added: "First and foremost, this is a scientific study of how the beavers cope naturally in the Scottish environment and what effect they have upon it.

"We will be closely tracking the beavers' activities and collecting data over the next five years to help inform the independent scientific monitoring.

'Recklessly irresponsible'

"This will help the Scottish Government in making any final decisions on the future of beavers in Knapdale Forest or elsewhere in Scotland."

Not everyone, however, is in favour of the reintroduction scheme.

Last year, the Association of Salmon Fishery Boards said it would be "recklessly irresponsible" to approve new schemes before looking at the impact on fish.

Concerns were also raised by Alan Kettlewhite, a biologist with Argyll Fisheries Trust, ahead of Friday's beaver release.

" **These charismatic creatures are not only likely to create interest in Scotland from further afield but crucially can play a key role in providing good habitat for a wide range of wetland species** "
Roseanna Cunningham Environment Minister

"Potentially they can alter the habitats of fish, restricting access to spawning grounds," he said.

"I think the concerns are based on studies in other countries where sometimes dam-building can prevent fish access to their spawning grounds, particularly in dry years where you don't get much rain in the autumn time."

But Allan Bantick, chair of the Scottish Beaver Trial, believes the programme is a step forward in "rebuilding the natural biodiversity of Scotland".

"Our critics worry that beavers might pose a risk to migratory fish numbers, including salmon," he said.

"This has not been found to be the case anywhere else in Europe.

"However, the notion cannot be tested with this trial because there is no Atlantic salmon present in the trial site.

'Historic day'

"Our beavers will be released within a designated trial area, which should be large enough to sustain the natural expansion of their population over the next five years."

Scotland's Environment Minister Roseanna Cunningham visited the trial site in Argyll on Friday morning.

She said the release marked "a historic day for conservation".

"These charismatic creatures are not only likely to create interest in Scotland from further afield but crucially can play a key role in providing good habitat for a wide range of wetland species," she said.

"And while a great deal of research has already gone into the reintroduction, this work is far from over.

"Observations and data collection over the next five years will play a crucial role in assessing the long-term future for beavers in the Scottish landscape."

Darren Dobson, from the Carinbaan Hotel near the release site, said he was delighted at the prospect of beavers, and hopes they will prove to be a major tourist attraction.

He said: "Generally speaking it's all positive. I haven't met anyone myself who is negative to the idea.

"It's going to bring more tourists - and this is just one more thing to add to what this area's got."

Scottish Natural Heritage (SNH) will monitor the relationship between beavers and woodland, water plants, river habitat, water levels, otters, dragonflies, damselflies and freshwater fish.

Monitoring programme

The beavers themselves will also be under close scrutiny, using tracking data.

SNH will co-ordinate the scientific monitoring work with a range of independent bodies, including Oxford University Wildlife Conservation Research Unit and the Argyll Fisheries Trust.

It is contributing £275,000 to the cost of monitoring the trial.

It is claimed the trial will be a major contribution to Scotland's Species Action Framework, which identifies 32 species, including European beaver, as the focus of new management action.

The beavers released on Friday were captured in the Telemark region of Norway in September last year.

They were flown to the UK in November and spent six months in quarantine.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/scotland/glasgow_and_west/8072443.stm

Published: 2009/05/29 10:01:51 GMT

To Protect an Ancient City, China Moves to Raze It

By MICHAEL WINES

KASHGAR, China — A thousand years ago, the northern and southern branches of the Silk Road converged at this oasis town near the western edge of the Taklamakan Desert. Traders from Delhi and Samarkand, wearied by frigid treks through the world's most daunting mountain ranges, unloaded their pack horses here and sold saffron and lutes along the city's cramped streets. Chinese traders, their camels laden with silk and porcelain, did the same.

The traders are now joined by tourists exploring the donkey-cart alleys and mud-and-straw buildings once window-shopped, then sacked, by Tamerlane and Genghis Khan.
Now, Kashgar is about to be sacked again.

Nine hundred families already have been moved from Kashgar's Old City, "the best-preserved example of a traditional Islamic city to be found anywhere in central Asia," as the architect and historian George Michell wrote in the 2008 book "Kashgar: Oasis City on China's Old Silk Road."
Over the next few years, city officials say, they will demolish at least 85 percent of this warren of picturesque, if run-down homes and shops. Many of its 13,000 families, Muslims from a Turkic ethnic group called the Uighurs (pronounced WEE-gurs), will be moved.
In its place will rise a new Old City, a mix of midrise apartments, plazas, alleys widened into avenues and reproductions of ancient Islamic architecture "to preserve the Uighur culture," Kashgar's vice mayor, Xu Jianrong, said in a phone interview.
Demolition is deemed an urgent necessity because an earthquake could strike at any time, collapsing centuries-old buildings and killing thousands. "The entire Kashgar area is in a special area in danger of earthquakes," Mr. Xu said. "I ask you: What country's government would not protect its citizens from the dangers of natural disaster?"
Critics fret about a different disaster.
"From a cultural and historical perspective, this plan of theirs is stupid," said Wu Lili, the managing director of the Beijing Cultural Protection Center, a nongovernmental group devoted to historic preservation. "From the perspective of the locals, it's cruel."
Urban reconstruction during China's long boom has razed many old city centers, including most of the ancient alleyways and courtyard homes of the capital, Beijing.
Kashgar, though, is not a typical Chinese city. Chinese security officials consider it a breeding ground for a small but resilient movement of Uighur separatists who Beijing claims have ties to international jihadis. So redevelopment of this ancient center of Islamic culture comes with a tinge of forced conformity.

Chinese officials have offered somewhat befuddling explanations for their plans. Mr. Xu calls Kashgar "a prime example of rich cultural history and at the same time a major tourism city in China." Yet the demolition plan would reduce to rubble Kashgar's principal tourist attraction, a magnet for many of the million-plus people who visit each year.
China supports an international plan to designate major Silk Road landmarks as United Nations World Heritage sites — a powerful draw for tourists, and a powerful incentive for governments to preserve historical areas.
But Kashgar is missing from China's list of proposed sites. One foreign official who refused to be identified for fear of damaging relations with Beijing said the Old City project had unusually strong backing high in the government.
The project, said to cost $440 million, began abruptly this year, soon after China's central government said it would spend $584 billion on public works to combat the global financial crisis.
It would complete a piecemeal dismantling of old Kashgar that began decades ago. The city wall, a 25-foot-thick earthen berm nearly 35 feet high, has largely been torn down. In the 1980s, the city paved the surrounding moat to create a ring highway. Then it opened a main street through the old town center.
Still, much of the Old City remains as it was and has always been. From atop 40 vest-pocket mosques, muezzins still cast calls to prayer down the narrow lanes: no loudspeakers here. Hundreds of artisans still hammer copper pots, carve wood, hone scimitars and hawk everything from fresh-baked flatbread to dried toads to Islamic prayer hats.

And tens of thousands of Uighurs still live here behind hand-carved poplar doors, many in tumbledown rentals, others in two-story homes that vault over the alleys and open on courtyards filled with roses and cloth banners.

The city says the Uighur residents have been consulted at every step of planning. Residents mostly say they are summoned to meetings at which eviction timetables and compensation sums are announced. Although the city offers the displaced residents the opportunity to build new homes on the sites of their old ones, some also complain that the proposed compensation does not pay for the cost of rebuilding.
"My family built this house 500 years ago," said a beefy 56-year-old man with a white crew cut, who called himself Hajji, as his wife served tea inside their two-story Old City house. "It was made of mud. It's been improved over the years, but there has been no change to the rooms."

In Uighur style, the home has few furnishings. Tapestries hang from the walls, and carpets cover the floors and raised areas used for sleeping and entertaining. The winter room has a pot-bellied coal stove; the garage has been converted into a shop from which the family sells sweets and trinkets. Nine rooms downstairs, and seven up, the home has sprawled over the centuries into a mansion by Kashgar standards. But Hajji and his wife lost their life's savings caring for a sick child, and the city's payment to demolish their home will not cover rebuilding it. Their option is to move to a distant apartment, which will force them to close their shop, their only source of income.

"The house belongs to us," said Hajji's wife, who refused to give her name. "In this kind of house, many, many generations can live, one by one. But if we move to an apartment, every 50 or 70 years, that apartment is torn down again.

"This is the biggest problem in our lives. How can our children inherit an apartment?"
Building inspectors have deemed most of the oldest homes unsafe, including all mud-and-straw structures, the earliest form of construction. They will be leveled and, in many cases, rebuilt in an earthquake-resistant Uighur style, the city promises.

But three of the Old City's seven sectors are judged unfit for Uighur architecture and will be rebuilt with decidedly generic apartment buildings. Two thousand other homes will be razed to build public plazas and schools. Poor residents, who live in the smallest homes, already are being permanently moved to boxy, concrete public housing on Kashgar's outskirts.

What will remain of old Kashgar is unclear. Mr. Xu said that "important buildings and areas of the Old City have already been included in the country's special preservation list" and would not be disturbed.

No archaeologists monitor the razings, he said, because the government already knows everything about old Kashgar.

Kashgar officials do have good reason to worry about earthquakes. Last October, a 6.8 magnitude quake struck barely 100 miles away. In 1902, an 8.0-magnitude quake, one of the 20th century's biggest, killed 667 residents
.
Some residents say they also prefer a more modern environment. The thousand-year-old design that gives the Old City its charm often precludes basics like garbage pickup, sewers and fire hydrants.
In Mr. Xu's view, demolition will give the Uighurs a better life and spare them from disaster in one fell swoop.

All that said, there is a certain aura of forcible eviction about the demolition, an urgency that fear of earthquakes does not completely explain. The city is offering cash bonuses to residents who move out early — about $30 for those who vacate within 20 days; $15 if they move in a month. Homes are razed as soon as they become empty, giving some alleys a gap-tooth look.
On Kashgar television, a nightly 15-minute infomercial hawks the project like ginsu knives, mixing dire statistics on seismic activity with scenes of happy Uighurs dancing in front of their new concrete apartments.

"Never has such a great event, such a major event happened to Kashgar," the announcer intones. He boasts that the new buildings "will be difficult to match in the world" and that citizens will "completely experience the care and warmth of the party" toward the Uighur ethnic minority.
The infomercial also notes that Communist Party officials from Kashgar to Beijing are so edgy over the prospect of an earthquake "that it is disturbing their rest."

http://www.nytimes.com/2009/05/28/world/asia/28kashgar.html?em=&pagewanted=all

Loves Me, Loves Me Not (Do the Math)

By Steven Strogatz

"In the spring," wrote Tennyson, "a young man's fancy lightly turns to thoughts of love." And so in keeping with the spirit of the season, this week's column looks at love affairs — mathematically. The analysis is offered tongue in cheek, but it does touch on a serious point: that the laws of nature are written as differential equations. It also helps explain why, in the words of another poet, "the course of true love never did run smooth."

To illustrate the approach, suppose Romeo is in love with Juliet, but in our version of the story, Juliet is a fickle lover. The more Romeo loves her, the more she wants to run away and hide. But when he takes the hint and backs off, she begins to find him strangely attractive. He, on the other hand, tends to echo her: he warms up when she loves him and cools down when she hates him. What happens to our star-crossed lovers? How does their love ebb and flow over time? That's where the math comes in. By writing equations that summarize how Romeo and Juliet respond to each other's affections and then solving those equations with calculus, we can predict the course of their affair. The resulting forecast for this couple is, tragically, a never-ending cycle of love and hate. At least they manage to achieve simultaneous love a quarter of the time.

The model can be made more realistic in various ways. For instance, Romeo might react to his own feelings as well as to Juliet's. He might be the type of guy who is so worried about throwing himself at her that he slows himself down as his love for her grows. Or he might be the other type, one who loves feeling in love so much that he loves her all the more for it.

Add to those possibilities the two ways Romeo could react to Juliet's affections — either increasing or decreasing his own — and you see that there are four personality types, each corresponding to a different romantic style. My students and those in Peter Christopher's class at Worcester Polytechnic Institute have suggested such descriptive names as Hermit and Malevolent Misanthrope for the particular kind of Romeo who damps out his own love and also recoils from Juliet's. Whereas the sort of Romeo who gets pumped by his own ardor but turned off by Juliet's has been called a Narcissistic Nerd, Better Latent Than Never, and a Flirting Fink. (Feel free to post your own suggested names for these two types and the other two possibilities.) Although these examples are whimsical, the equations that arise in them are of the far-reaching kind known as differential equations. They represent the most powerful tool humanity has ever created for making sense of the material world. Sir Isaac Newton used them to solve the ancient mystery of planetary motion. In so doing, he unified the heavens and the earth, showing that the same laws of motion applied to both.

In the 300 years since Newton, mankind has come to realize that the laws of physics are always expressed in the language of differential equations. This is true for the equations governing the flow of heat, air and water; for the laws of electricity and magnetism; even for the unfamiliar and often counterintuitive atomic realm where quantum mechanics reigns.

In all cases, the business of theoretical physics boils down to finding the right differential equations and solving them. When Newton discovered this key to the secrets of the universe, he felt it was so precious that he published it only as an anagram in Latin. Loosely translated, it reads: "It is useful to solve differential equations."

The silly idea that love affairs might progress in a similar way occurred to me when I was in love for the first time, trying to understand my girlfriend's baffling behavior. It was a summer romance at the end of my sophomore year in college. I was a lot like the first Romeo above, and she was even more like the first Juliet. The cycling of our relationship was driving me crazy until I realized that we were both acting mechanically, following simple rules of push and pull. But by the end of the summer my equations started

to break down, and I was even more mystified than ever. As it turned out, the explanation was simple. There was an important variable that I'd left out of the equations — her old boyfriend wanted her back.

In mathematics we call this a three-body problem. It's notoriously intractable, especially in the astronomical context where it first arose. After Newton solved the differential equations for the two-body problem (thus explaining why the planets move in elliptical orbits around the sun), he turned his attention to the three-body problem for the sun, earth and moon. He couldn't solve it, and neither could anyone else. It later turned out that the three-body problem contains the seeds of chaos, rendering its behavior unpredictable in the long run.

Newton knew nothing about chaotic dynamics, but he did tell his friend Edmund Halley that the three-body problem had "made his head ache, and kept him awake so often, that he would think of it no more."

I'm with you there, Sir Isaac.

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NOTES:

For models of love affairs based on differential equations, see Section 5.3 in Strogatz, S. H. (1994) "Nonlinear Dynamics and Chaos." Perseus, Cambridge, MA.

For Newton's anagram, see page vii in Arnol'd, V. I. (1988) "Geometrical Methods in the Theory of Ordinary Differential Equations." Springer, New York.

Chaos in the three-body problem is discussed in Peterson, I. (1993) "Newton's Clock: Chaos in the Solar System." W.H. Freeman, San Francisco.

For the quote about how the three-body problem made Newton's head ache, see page 158 in Volume II of Brewster, D. (1855) "Memoirs of the Life, Writings, and Discoveries of Sir Isaac Newton." Thomas Constable and Company, Edinburgh.

For readers who are curious about the math used here:
In the first story above, Romeo's behavior was modeled by the differential equation dR/dt = aJ. This equation describes how Romeo's love (represented by R) changes in the next instant (represented by dt). The amount of change (dR) is just a multiple (a) of Juliet's current love (J) for him. This equation idealizes what we already know – that Romeo's love goes up when Juliet loves him – by assuming something much stronger. It says that Romeo's love increases in direct linear proportion to how much Juliet loves him. This assumption of linearity is not emotionally realistic, but it makes the subsequent analysis much easier. Juliet's behavior, on the other hand, was modeled by the equation dJ/dt = -bR. The negative sign in front of the constant b reflects her tendency to cool off when Romeo is hot for her. Given these equations and an assumption about how the lovers felt about each other initially (R and J at time t = 0), one can use calculus to inch R and J forward, instant by instant. In this way, we can figure out how much Romeo and Juliet love (or hate) each other at any future time. For this elementary model, the equations should be familiar to students of math and physics: Romeo and Juliet behave like simple harmonic oscillators.

http://judson.blogs.nytimes.com/2009/05/26/guest-column-loves-me-loves-me-not-do-the-math/

Animals can tell right from wrong

Animals possess a sense of morality that allows them to tell the difference between right and wrong, according to a controversial new book.

By Richard Gray, Science Correspondent
Last Updated: 5:40PM BST 24 May 2009

Research suggests that it's not just humans who have a moral compass Photo: GETTY

Scientists studying animal behaviour believe they have growing evidence that species ranging from mice to primates are governed by moral codes of conduct in the same way as humans.

Until recently, humans were thought to be the only species to experience complex emotions and have a sense of morality.

But Prof Marc Bekoff, an ecologist at University of Colorado, Boulder, believes that morals are "hard-wired" into the brains of all mammals and provide the "social glue" that allow often aggressive and competitive animals to live together in groups.

He has compiled evidence from around the world that shows how different species of animals appear to have an innate sense of fairness, display empathy and help other animals that are in distress.

His conclusions will provide ammunition for animal welfare groups pushing to have animals treated more humanely, but some experts are sceptical about the extent to which animals can experience complex emotions and social responsibility.

Prof Bekoff, who presents his case in a new book Wild Justice, said: "The belief that humans have morality and animals don't is a long-standing assumption, but there is a growing amount of evidence that is showing us that this simply cannot be the case.

"Just as in humans, the moral nuances of a particular culture or group will be different from another, but they are certainly there. Moral codes are species specific, so they can be difficult to compare with each other or with humans."

Prof Bekoff believes morals developed in animals to help regulate behaviour in social groups of animals such as wolves and primates.

He claims that these rules help to control fighting within the group and encourage co-operative behaviour.

Recent neurology work has also revealed that distantly related mammals such as whales and dolphins have the same structures in their brains that are thought to be responsible for empathy in humans.

Other findings have also suggested that some animals may even be capable of showing empathy with the suffering of other species.

Prof Bekoff, who co-wrote the book with moral philosopher Jessica Pierce, also from the University of Colorado, added: "There are cases of dolphins helping humans to escape from sharks and elephants that have helped antelope escape from enclosures.

"While it is difficult to know for certain that there is cross species empathy, it is hard to argue against it."

His ideas have met with some controversy in the scientific community, but many admit it is difficult to argue that animals do not share many of the psychological qualities previously only attributed to humans.

Professor Frans de Waal, a primate behaviourist at Emory University, Atlanta, Georgia, said: "I don't believe animals are moral in the sense we humans are – with well developed and reasoned sense of right and wrong – rather that human morality incorporates a set of psychological tendencies and capacities such as empathy, reciprocity, a desire for co-operation and harmony that are older than our species.

"Human morality was not formed from scratch, but grew out of our primate psychology. Primate psychology has ancient roots, and I agree that other animals show many of the same tendencies and have an intense sociality."

WOLVES

Wolves live in tight-knit social groups that are regulated by strict rules. If a pack grows too large, members are not able to bond closely enough and the pack disintegrates. Wolves also demonstrate fairness.

During play, dominant wolves will "handicap" themselves by engaging in roll reversal with lower ranking wolves, showing submission and allowing them to bite, provided it is not too hard.

Prof Bekoff argues that without a moral code governing their actions, this kind of behaviour would not be possible. If an animal bites too hard, it will initiate a "play bow" to ask forgiveness before play resumes.

COYOTES

In other members of the dog family, play is controlled by similar rules. Among coyotes, cubs which bite too hard are ostracised by the rest of the group and often end up having to leave entirely.

"We looked at the mortality of these young animals who disperse from the group and they have four to five times higher mortality," said Bekoff.

Experiments with domestic dogs, where one animal was given a treat and another denied, have shown that they posses a sense of fairness as they shared their treats.

ELEPHANTS

Elephants are intensely sociable and emotional animals. Research by Iain Douglas Hamilton, from the department of zoology at Oxford University, suggests elephants experience compassion and has found evidence of elephants helping injured or ill members of their herd.

In one case, a Matriarch known as Eleanor fell ill and a female in the herd gently tried to help Eleanor back to her feet, staying with her before she died.

In 2003, a herd of 11 elephants rescued antelope who were being held inside an enclosure in KwaZula-Natal, South Africa.

The matriarch unfastened all of the metal latches holding the gates closed and swung the entrance open allowing the antelope to escape.

This is thought to be a rare example of animals showing empathy for members of another species – a trait previously thought to be the exclusive preserve of mankind.

DIANA MONKEYS

A laboratory experiment trained Diana monkeys to insert a token into a slot to obtain food.

A male who had grown to be adept at the task was found to be helping the oldest female who had not been able to learn how to insert the token.

On three occasion the male monkey picked up tokens she dropped and inserted them into the slot and allowed her to have the food.

As there was no benefit for the male monkey, Prof Bekoff argues that this is a clear example of an animal's actions being driven by some internal moral compass.

CHIMPANZEES

Known to be among the most cognitively advanced of the great apes and our closest cousin, it is perhaps not surprising that scientists should suggest they live by moral codes.

A chimpanzee known as Knuckles – from the Centre for Great Apes in Florida – is the only known captive chimpanzee to suffer from cerebral palsy, which leaves him physically and mentally handicapped.

Scientists have found that other chimpanzees in his group treat him differently and he is rarely subjected to intimidating displays of aggression from older males.

Chimpanzees also demonstrate a sense of justice and those who deviate from the code of conduct of a group are set upon by other members as punishment.

RODENTS

Experiments with rats have shown that they will not take food if they know their actions will cause pain to another rat. In lab tests, rats were given food which then caused a second group of rats to receive an electric shock.

The rats with the food stopped eating rather than see another rat receive a shock. Similarly, mice react more strongly to pain when they have seen another mouse in pain.

Recent research from Switzerland also showed that rats will help a rat, to which it is not related, to obtain food if they themselves have benefited from the charity of others. This reciprocity was thought to be restricted to primates.

BATS

Vampire bats need to drink blood every night but it is common for some not to find any food. Those who are successful in foraging for blood will share their meal with bats who are not successful.

They are more likely to share with bats who had previously shared with them. Prof Bekoff believes this reciprocity is a result of a sense of affiliation that binds groups of animals together.

Some studies have shown that animals experience hormonal changes that lead them to "crave" social interaction.

Biologists have also observed a female Rodrigues fruit-eating bat in Gainesville, Florida, helping another female to give birth by showing the pregnant female the correct birthing position – with head up and feed down.

WHALES

Whales have been found to have spindle cells in their brains. These very large and specialised cells were thought to be restricted to humans and other great apes and appear to play a role in empathy and understanding the feelings of others.

Humpback whales, fin whales, killer whales and sperm whales have all been found to have spindle cells in the same areas of their brains.

They also have three times as many spindle cells compared to humans and are thought to be older in evolutionary terms.

This finding has suggested that complex emotional judgements such as empathy may have evolved considerably earlier in history than previously thought and could be widespread in the animal kingdom.

http://www.telegraph.co.uk/earth/wildlife/5373379/Animals-can-tell-right-from-wrong.html

God Is Back: How the Global Rise of Faith Is Changing the World

John Gray

Published 21 May 2009

Contrary to what evangelical rationalists preach, it is perfectly possible both to be modern and to believe in God. But there is no reason to assume that the American religious model will prevail

Faith in the future

"Religion is proving perfectly compatible with modernity in all its forms, high and low." This conclusion by John Micklethwait, editor of the *Economist*, and Adrian Wooldridge, the magazine's Washington bureau chief, seems calculated to enrage secular rationalists of all stripes.

Whether Marxian or Millian, socialist or liberal, secular rationalists have held one tenet in common: religion belongs to the infancy of the species; the more modern a society becomes, the less room there is for religious belief and practice. Never questioned, this is what lies behind the hot-gospel sermons of evangelical atheists: if you want to be modern, say goodbye to God.

At bottom, the assertion that religion is destined to die out is a confession of faith. No amount of evidence will persuade secular believers that they are on the wrong side of history, but one of the achievements of *God Is Back* is to show how implausible, if not ridiculous, their view of history actually is.

The notion that modernity and religion are at odds is a generalisation from the experience of some parts of Europe. Europe is now largely post-Christian and the majority no longer follows any conventional creed, but things are otherwise in much of the rest of the world, and notably so in the US, which, during most of its history, has been intensely religious and self-consciously modern.

European Enlightenment thinkers have tended to see the US as the exception that proves the rule – an unexplained lag in a universal trend towards secularisation.

Against this view, Micklethwait and Wooldridge show that modernisation and an increase in religiosity go together in much of the world. Some of the most powerful sections of the book feature narratives of religious communities in improbable places – prosperous, highly educated Chinese, among them scientists and academics, coming together in contemporary Shanghai to read and discuss the Christian Bible, for example.

If there is any trend that can be discerned in the parts of the world that are most rapidly modernising, it is that secular belief systems are in decline and the old faiths are being reborn.

Micklethwait and Wooldridge aim to do more than show that modernity and religion are compatible, however.

Arguing that "the great forces of modernity – technology and democracy, choice and freedom – are all strengthening religion rather than undermining it", they go on to claim that one version of modernity is spreading nearly everywhere. "The world is generally moving in the American direction, where religion and modernity happily coexist," they write. At this point the authors – one Catholic, the other atheist, we are told – emerge as missionaries for the American Way, and the argument becomes distinctly implausible.

It is one thing to argue that the model of universal secularisation is mistaken, and to show – as the authors do very effectively – that the decline of religion in Europe is not going to be repeated worldwide. It is another thing altogether to suggest that an American kind of religiosity is spreading nearly everywhere.

One problem is the conception of religion the authors deploy.

Nearly always, religion for them means monotheism – more specifically, Christianity and Islam. Polytheistic and non-theistic religions such as Hinduism and Buddhism are allowed a few pages, but only in order to argue that "American methods can work" even for them.

Another is their assumption that modernity is a Good Thing. Like so many western commentators, the authors berate the Muslim world, supposedly stuck in medieval torpor, for its failure to modernise. One had hoped that it was now understood that Lenin, Stalin and Hitler were not throwbacks to the Middle Ages. In their different ways, all three were radically modern – just like al-Qaeda today. If a certain type of pluralism appears only in modern times, the same is true of totalitarianism. There are many ways of being modern, some of them far from benign.

A larger problem is the authors' Americocentric world-view. It might be argued that this does not matter, as the book is plainly directed chiefly at American readers. Yet it does matter if the authors aim to say something useful about the way the world is actually moving.

A part of their argument is the claim that religions have done well by adopting modern corporate practices.

Religion has become a competitive business, they point out, with faith entrepreneurs actively creating and serving their customer base. They describe a Hindu temple in Bangalore that "uses every modern method to entice and service believers", including "a website that is as user-friendly as that of any American mega-church".

No doubt these are valid observations, but the authors use them to argue for "American-style pastorpreneurship" as a universal model. They acknowledge that although the American way of religion is spreading faster than the European, "that does not mean it will conquer every corner of the world".

They are nonetheless insistent that the American model is better adapted than any other to the modern world.

Here Micklethwait and Wooldridge repeat the canonical fallacy of American theorists of globalisation such as Thomas Friedman. It is true that some American business methods have been widely adopted. That does not mean humankind is embracing an American model of capitalism, or of religion.

Hypermodern Japan has many new religions, some of them very obviously organised as businesses, but it remains a country still largely untouched by individualism. Hinduism is now practised worldwide, but in India its revival has been linked with nationalism rather than pluralism. The same is true of the revival of Orthodoxy in Russia, and the resurgence of Confucianism that is under way in China.

Religion is advancing in many parts of the world, but it is no more likely that a single dominant model of religious practice will emerge from this process than that a single version of capitalism has emerged from globalisation.

Modernity can coexist with religion in many ways, none of which is going to be adopted universally. The authors promote a US-style secular constitution as a global panacea and shake their heads sternly at Britain's archaic religious establishment, not pausing to ask whether it may have played a part in protecting us from the fundamentalism that has poisoned the American political process.

More generally, they assume that ideas which emerged from within western Christian traditions can be applied anywhere. But as energy and power flows eastwards, the secular ideologies that developed from Christianity are likely to dwindle in influence.Rightly, Micklethwait and Wooldridge note that the grand secular belief systems of the past two centuries continued Christian ways of thinking: "Marx found it impossible not to think in terms of grand eschatologies . . . He employed numerous religious tropes – communists are latter-day gnostics, communism is heaven on earth, the revolution is the Last Judgement, workers are saved and capitalism is damned."

In other words, God never really went away, for secular political projects were continuations of Christianity by other means. But if Marxism is a post-Christian creed that is now obsolete, why should liberalism – in its militant, proselytising form – be any different? In fact, it has been in decline for some time, a process that began with the fall of communism.The Soviet collapse was hailed as a triumph for the west. But communism is a prototypical western ideology, and there was never any prospect that Russia – a country which has always straddled Europe and Asia – would convert to neoliberalism, another western confection. It was naive to expect that post-communist Russia would embrace a western model of government and the economy in the 1990s, and it is even more misguided to look forward to the Americanisation of religion at the present time.

If it is true that faith is now a branch of business, religion may opt to follow the money – a journey that no longer leads in the direction of the United States. While there will be no universal pattern, the rediscovery of Confucianism is probably a better clue to the way the world will look a few decades from now than the proliferation of mega-churches.*God Is Back* may not show that the American way of religion is uniquely well suited to the modern condition. Where this urgently relevant book succeeds triumphantly is in demolishing the myth of an emerging secular civilisation.

Evangelising rationalists will continue to deny the fact, but religion – in all its varieties – is shaping the future, much as it shaped the past.*John Gray's latest book is "Gray's Anatomy: Selected Writings" (Allen Lane, £20). He will be in conversation with John Micklethwait on 1 June at the London School of Economics, London WC2*

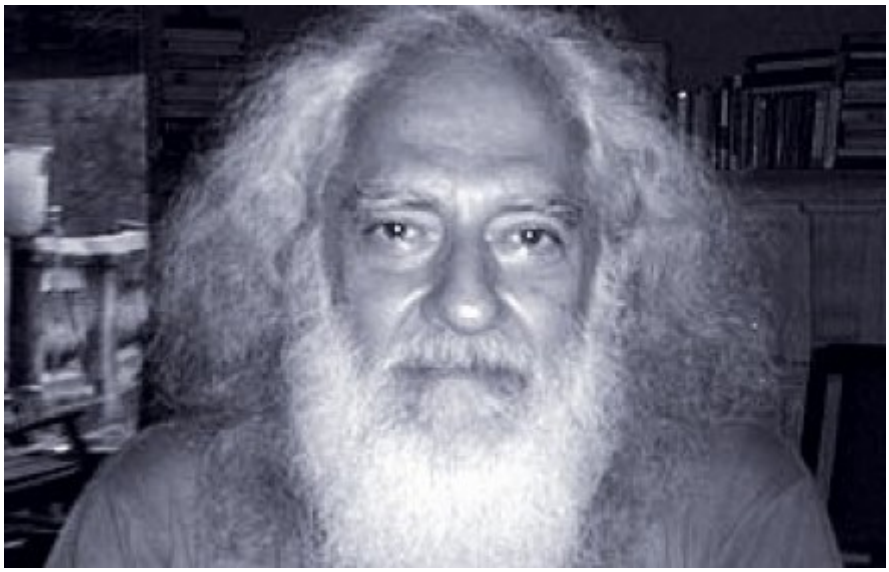
God Is Back: How the Global Rise of Faith Is Changing the World
John Micklethwait and Adrian Wooldridge
Allen Lane, 405pp, £25

http://www.newstatesman.com/books/2009/05/religion-american-modern-world

Poetic injustice
Salil Tripathi

Published 28 May 2009

Observations on poetry's poisonous side



The election for the post of professor of poetry at Oxford University began as a contest, turned into a tragedy, and is now a farce.

The professor's role is to give three lectures a year for five years. This time round, the election became a salacious saga when decades-old allegations of sexual misdemeanour surfaced against the leading candidate – the Nobel laureate Derek Walcott. Voters were reminded that Walcott had made inappropriate advances towards a female student at Harvard in the 1980s and had given her a low grade when she said no, only to give her a pass after she protested.

This, the campaign whispered, made him unworthy.

Walcott, who likes literary slugfests – he has called the other Caribbean Nobel laureate "V S Nightfall", and last year wrote a forgettable poem criticising him – withdrew from the race. Ruth Padel, who had become the front-runner, decried the smears, while the third candidate, the Indian poet Arvind Krishna Mehrotra, maintained a quiet dignity.

With the votes in, Padel won, defeating Mehrotra 297-129. But then, over the May bank holiday weekend, newspapers revealed that Padel had pointed journalists to a book called *The Lecherous Professor*, which detailed allegations against Walcott. Padel said she had acted out of concern for female students and regretted sending the emails, and that she would not take up the post. This raised an interesting dilemma: can you resign from a post you have not yet assumed?

Poets can ponder the right word for it – but what next? Some have suggested fresh elections. Clive James has thrown his hat into the ring, and other names, such as Michael Longley and Margaret Atwood, are being floated. Anyone but Mehrotra, apparently.

But Mehrotra ran a clean campaign: he had neither made unwelcome advances in the past nor acted in an underhand manner lately. He is also an excellent poet. "From this distance," he says, "from any distance,

it all seems very unfortunate." Even though he was a late entrant, he polled nearly a third of the valid votes, or "the largest number of votes by a long margin received by an outsider candidate", as the novelist Amit Chaudhuri, who campaigned for Mehrotra, puts it.

Oxford is notoriously insular; some who opposed Walcott said that his living in the West Indies was a problem. Chaudhuri says the aim has always been to bring English-language poetry outside of Anglo-American literary tradition into the English frame. Mehrotra does exactly that.

When I asked him what his lectures would be about, he told me: "I would speak about the 2,500-year-old Indian poetic tradition, starting with the poets of the Gathasaptasati, then going on to the bhakti poets, like Kabir, who didn't tire of pouring scorn on Hindu priests and Muslim mullahs alike, much as we do; and ending with lectures on contemporaries such as A K Ramanujan, Arun Kolatkar, Eunice de Souza and Adil Jussawalla."

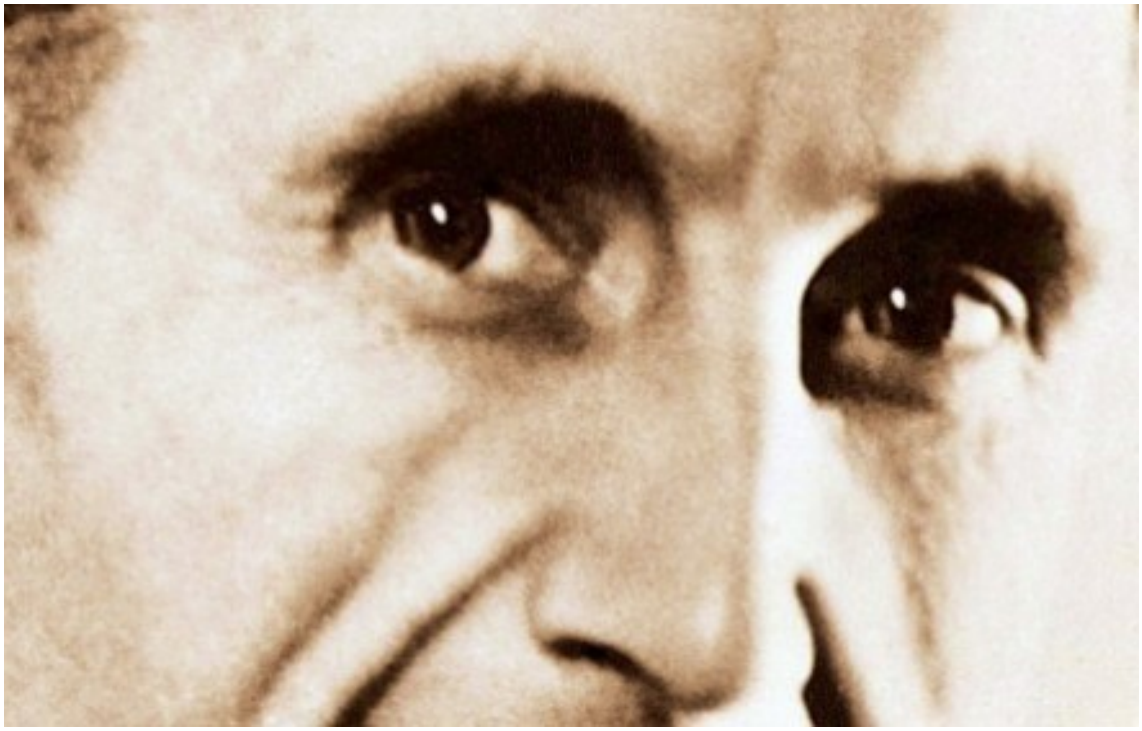
That's the kind of rich scholarship an ancient university needs. The last man standing would lend the post grace, which, at the moment, is in somewhat short supply.

http://www.newstatesman.com/poetry/2009/06/mehrotra-poetry-walcott-poetic

Eternal vigilance
Keith Gessen

Published 28 May 2009

Throughout the 1940s, George Orwell was formulating the ideas about language and politics that found their ultimate expression in *Nineteen Eighty-Four*. His essays from this period are a plain-spoken pleasure, despite their contradictions



By 1940, George Orwell had behind him four conventional "social" novels and, more significantly, three books of documentary reportage, each one better than the last, culminating in his classic account of the Spanish Civil War, *Homage to Catalonia*.

Gradually in the others but culminating in *Homage*, Orwell perfected his signature "plain" style, which so resembles someone speaking honestly and without pretence directly to you, and he had more or less settled on his political opinions: "Every line of serious work that I have written since 1936 has been written, directly or indirectly, against totalitarianism and for democratic socialism, as I understand it." So he said in 1946.

But while this may have been settled, there were other matters Orwell was still working out in his mind. The subjects of the essays Orwell wrote in the 1940s are almost all, in one way or another, things Orwell doesn't like. The essays are incessantly self-contradicting. First, Orwell declares that no great novel could now be written from a Catholic (or communist) perspective; later he allows that a novel could be written from such a perspective, in a pinch; and then, in his essay on Graham Greene, he comes very near to suggesting that only Catholics can now write novels.

In his essay on T S Eliot, he writes that it is "fashionable to say that in verse only the words count and 'meaning' is irrelevant, but in fact every poem contains a prose-meaning, and when the poem is any good it is a meaning which the poet urgently wishes to express. All art is to some extent propaganda." Several years later, in "The Prevention of Literature", in arguing for the idea that poetry might survive

totalitarianism while prose would not, he writes that "what the poet is saying – that is, what his poem 'means' if translated into prose – is relatively unimportant even to himself".

What is particularly frustrating about these contradictions is that at each successive moment Orwell presents them in his great style, his wonderful sharp-edged plain-spoken style, which makes you feel that there is no way on earth you could possibly disagree with him, unless you're part of the pansy left, or a sandal-wearer and fruit-juice drinker, or maybe just a crank.

In a way I'm exaggerating, because the rightness of Orwell on a number of topics has been an albatross around his neck for 60 years. In truth, Orwell was wrong about all sorts of things, not least the inner logic of totalitarianism: he thought a mature totalitarian system would so deform its citizenry that they would not be able to overthrow it. This was the nightmare vision of *Nineteen Eighty-Four*. In fact, as it turned out in Russia, even the ruling elite was not willing to maintain mature totalitarianism after Stalin's death.

Other totalitarian regimes have repeated the pattern. Orwell was wrong and Orwell contradicted himself. He was more insightful about the distant dangers of communist thought-control, in the Soviet Union, than the more pressing thought-control of western consumerism. Nor did he see the sexual revolution coming, not by a long shot; one wonders what the too-frequent taunter of the "pansy left" would have made of the fact that the gay movement was one of the most successful, because most militant, of the post-1960s liberation struggles.

But there is a deeper logic in Orwell's essays, beneath the contradictions and inevitable oversights. The crisis that he was writing himself through in the 1940s was the crisis of the war and, even more confusingly, the postwar. It involved a kind of projection into the future of certain tendencies latent in the present. Orwell worries about the potential Sovietisation of Europe, but also the infection by totalitarian thinking of life outside the Soviet sphere – not just specific threats to specific freedoms, but to deeper structures of feeling. As the philologist Syme says to Winston Smith in *Nineteen Eighty-Four*: "Don't you see that the whole aim of Newspeak is to narrow the range of thought? . . . Every year fewer and fewer words, and the range of consciousness is smaller."

If Orwell was wrong in some sense about the long-term development of totalitarianism, he was right about its deepest intellectual intentions, about the rot it wished to create at the centre of thinking itself. And he was right that this rot could spread.

One solution would be to cordon off literature from life and politics entirely: this was, in some sense, the solution adopted by the writers of the previous generation – Eliot, James Joyce, D H Lawrence, Ezra Pound – whom Orwell calls the writers of the 1920s and we now call the high modernists. And yet he did not want to make a special plea for literature; in fact, of all the writers of his time, Orwell was constitutionally the least capable of making this separation. His own writing and politics were the fruit of his specific experience – of imperialism in Burma, of the conditions in the English coal mines, of the war in Spain. He insists on several occasions that "all art is propaganda" – the expression of a particular world-view. In Dickens's case, for example, this is the world-view of a classic 19th-century bourgeois liberal, a world-view Orwell admires even as he sees its limitations.

For the Orwell of the early essays, the case of Henry Miller is the tough one. Because while Dickens's politics are in the end congenial enough, Miller's quietism is less so. "I first met Miller at the end of 1936, when I was passing through Paris on my way to Spain," writes Orwell. "What most intrigued me about him was to find that he felt no interest in the Spanish war whatever. He merely told me in forcible terms that to go to Spain at that moment was the act of an idiot." Orwell nonetheless went to Spain, and fought there. He was a writer who felt it was vital to let politics animate his work; Miller was the opposite.

And yet Orwell contrasts Miller favourably to W H Auden, who at this time in the poem "Spain" was miming the thoughts of the good party man about the "necessary murder". Miller is so far removed from this sort of sentiment, so profound is his individualism and his conviction, that Orwell comes close to

endorsing it: "Seemingly there is nothing left but quietism robbing reality of its terrors by simply submitting to it. Get inside the whale – or rather, admit that you are inside the whale (for you are, of course)." Except Orwell doesn't really mean this. He may be inside the whale but he does not intend to stop disturbing its digestion, he does not intend to be any more quietistic.

What he admired above all in Miller was his willingness to go against the grain of the time. While all art is propaganda, it needn't necessarily propagandise something correct. The important thing is that the writer himself believe it.

But there are certain things that you simply can't believe. "No one ever wrote a great novel in praise of the Inquisition," he asserts. Is that true? At almost the exact same moment, Jean-Paul Sartre (a writer who, Orwell thought, incorrectly, was "full of air") was writing in *What Is Literature?*: "Nobody can suppose for a moment that it is possible to write a good novel in praise of anti-Semitism." Is that true? It seems to have been a problem that leftist writers of the 1940s were going to face by sheer bluff assertion.

For Orwell the number of beliefs hostile to literary production seemed to expand and expand. Eliot's "Four Quartets" is labelled "Pétainist" – a fairly strong term to hurl at a long experimental poem that doesn't even rhyme. And Salvador Dalí, in "Benefit of Clergy", is a "rat".

As the war goes on, then ends, Orwell's sense of peril grows sharper, and he looks at literature in a different way. He comes to think that no matter who wins, the world will find itself split again into armed camps, each of them threatening the others, none of them truly free – and literature will simply not survive. This is the landscape of *Nineteen Eighty-Four* and it is also the landscape of his later essays – "The Prevention of Literature", "Politics and the English Language", "Writers and Leviathan".

There is even, momentarily, a kind of hallucination, in the curious short piece "Confessions of a Book Reviewer", where some of Orwell's old interest in the starving writer crops up, now mixed with the wintry gloominess of his later years: "In a cold but stuffy bed- sitting room littered with cigarette ends and half-empty cups of tea, a man in a moth-eaten dressing gown sits at a rickety table, trying to find room for his typewriter among the piles of dusty papers that surround it . . . He is a man of 35, but looks 50. He is bald, has varicose veins and wears spectacles, or would wear them if only his pair were not chronically lost."

Who is this but Winston Smith, the failed hero of *Nineteen Eighty-Four*, figured as a book reviewer? Or who, conversely, is Winston Smith, but a book reviewer figured as the prisoner of a futuristic totalitarian regime?

With great doggedness, Orwell keeps delving into the question of literature's position in society, and what might be done to keep it alive in a time of total politics. In "Writers and Leviathan", dated 1948, he argues that writers must ultimately separate themselves from their political work. It's a depressing essay and it ends – one wonders whether Orwell was aware of this – with an echo of the line of Auden's he so reviled: the writer capable of separating himself from his political activity will be the one who "stands aside, records the things that are done and admits their necessity, but refuses to be deceived as to their true nature".

Orwell was always a realist who knew that politics was a dirty business –
but he was never quite such a realist as here. The realm of freedom had finally shrunk to a small, small point, and it had to be defended. As Winston Smith says in *Nineteen Eighty-Four*, "Nothing was your own except the few cubic centimetres inside your skull."

It is hard not to wonder whether the pessimism of this conclusion was partly a response to the art (or propaganda) Orwell was himself creating in those years. He had published *Animal Farm* in 1945; weakened by the tuberculosis that would kill him, he was writing *Nineteen Eighty-Four* in 1947-48. After the reception of *Animal Farm*, and with the direction *Nineteen Eighty-Four* was taking, it must have been

clear to him on some level that the world was going to use these books in a certain way. And it did use them that way.

The socialist critique of Orwell's late work seems essentially correct – they were not only anti-Stalinist but anti-revolutionary, and were read as such by millions of ordinary people (a fact that Orwell, who was always curious to know what ordinary people thought, would have had to respect). Out of "necessity" he had chosen a position, and a way of stating that position, that would be used for years to come to bludgeon the anti-war, anti-imperialist left.

That he had chosen honestly what seemed to him the least bad of a set of bad political options did not make them, in the long view of history, any better.

But what a wonderful writer he had become! That voice – once you've heard it, how do you get it out of your head? It feels like the truth, even when it's not telling the truth. It is clear and sharp but unhurried; Orwell is not afraid to be boring, which means that he is never boring.

His voice as a writer had been formed before Spain, but Spain gave him a jolt – not the fighting nor his injury (a sniper had shot him through the throat in 1937), though these had their effects, but the calculated campaign of deception he saw in the press when he got back, waged by people who knew better. "Early in life I had noticed that no event is ever correctly reported in a newspaper," Orwell recalled, "but in Spain, for the first time, I saw newspaper reports which did not bear any relation to the facts, not even the relationship which is implied in an ordinary lie. I saw great battles reported where there had been no fighting, and complete silence where hundreds of men had been killed . . . This kind of thing is frightening to me, because it often gives me the feeling that the very concept of objective truth is fading out of the world. After all, the chances are that those lies, or at any rate similar lies, will pass into history."

This insight reverberates through Orwell's work for the rest of his life. The answer to lies is to tell the truth. But how? How do you even know what the truth is, and how do you create a style in which to tell it? Orwell's answer is laid out in "Politics and the English Language": You avoid ready phrases, you purge your language of dead metaphors, you do not claim to know what you do not know. Far from being a relaxed prose (which is how it seems), Orwell's is a supremely vigilant one.

It is interesting that Orwell did not go to university. He went to Eton, but loafed around there and, afterwards, went off to Burma as a police officer. University is where you sometimes get loaded up with fancy terms whose meaning you're not quite sure of. Orwell was an intellectual and a highbrow who thought Joyce, Eliot and Lawrence were the greatest writers of his age, but he never uses fancy terms.

You could say that Orwell was not essentially a literary critic, or that he was the only kind of literary critic worth reading. He was most interested in the way that literature intersects with life, with the world, with groups of actual people. Some of his more enjoyable essays deal with things that a lot of people read and consume – postcards, detective fiction, "good bad books" (and poetry) – simply because a lot of people consume them.

Postwar intellectuals would celebrate (or bemoan) the "rise of mass culture". Orwell never saw it as a novel phenomenon. He was one of the first critics to take popular culture seriously because he believed it had always been around and simply wanted attention. These essays are part of a deeply democratic commitment to culture in general and reading in particular.

His reading of writers who were more traditionally "literary" is shot through with the same commitment. Orwell had read a great deal, and his favourite writers were by many standards difficult writers, but he refused to appeal to the occult mechanisms of literary theory. "One's real reaction to a book, when one has a reaction at all, is usually 'I like this book' or 'I don't like it,' and what follows is a rationalisation.

But 'I like this book' is not, I think, a non-literary reaction." And the "rationalisation", he saw, was going to involve your background, your expectations, the historical period you're living through.

If we compare Orwell to his near-contemporary Edmund Wilson, who was in many senses a more sensitive critic, we see Orwell's peculiar strength. At almost the exact same moment as Orwell, in early 1940, Wilson published a psychobiographical essay on Dickens in which he traced much of Dickens's later development to his brush with poverty as a young man.

Orwell's treatment is much more sociological and political, and in a way less dramatic than Wilson's. Yet at one point Orwell encapsulates Wilson's argument with a remarkable concision: "Dickens had grown up near enough to poverty to be terrified of it, and in spite of his generosity of mind, he is not free from the special prejudices of the shabby-genteel." This is stark, and fair, and that "terrified" is unforgettable.

You can tie yourself in knots – many leftist intellectuals have done this over the years – trying to prove that Orwell's style is a façade, an invention, a mask he put on when he changed his name from Eric Blair to "George Orwell"; that by seeming to tell the whole story in plain and honest terms, it actually makes it more difficult to see, it obfuscates, the part of the story that's necessarily left out; that ultimately it rubber-stamps the status quo.

In some sense, intellectually, all this is true enough; you can spend a day, a week, a semester proving it. There really are things in the world that Orwell's style would never be able to capture. But there are very few such things.Orwell did not want to become a saint, but he became a saint anyway. For most of his career a struggling writer, eking out a living reviewing books at an astonishing rate, he was gradually acknowledged, especially after the appearance of *Homage to Catalonia* in 1938, to be a great practitioner of English prose. With the publication of *Animal Farm* – a book turned down by several of England's pre-eminent houses because they did not want to offend Britain's ally the Soviet Union – Orwell became a household name.

Then his influence grew and grew, so that shortly after his death he was already a phenomenon. "In the Britain of the 1950s," the great cultural critic Raymond Williams once lamented, "along every road that you moved, the figure of Orwell seemed to be waiting. If you tried to develop a new kind of popular cultural analysis, there was Orwell; if you wanted to report on work or ordinary life, there was Orwell; if you engaged in any kind of socialist argument, there was an enormously inflated statue of Orwell warning you to go back." In a way the incredible posthumous success of Orwell has seemed one of the more peculiar episodes in the cultural life of the west. He was not, as Lionel Trilling once pointed out, a genius; he was not mysterious; he had served in Burma, washed dishes in a Parisian hotel, and fought for a few months in Spain, but this hardly added up to a life of adventure; for the most part he lived in London and reviewed books. So odd, in fact, has the success of Orwell seemed to some that there is even a book, *George Orwell: the Politics of Literary Reputation*, devoted to getting to the bottom of it.

When you return to his essays of the 1940s, the mystery evaporates. You would probably not be able to write this way now, even if you learned the craft: the voice would seem put-on, after Orwell. But there is nothing put-on about it here, and it seems to speak, despite the specificity of the issues discussed, directly to the present. In Orwell's clear, strong voice we hear a warning. Because we, too, live in a time when truth is disappearing from the world, and doing so in just the way Orwell worried it would: through language. We move through the world by naming things in it, and we explain the world through sentences and stories. The lesson of these essays is clear: Look around you.

Describe what you see as an ordinary observer – for you are one, you know – would see them. Take things seriously. And tell the truth. Tell the truth.

Keith Gessen is a novelist and critic

http://www.newstatesman.com/books/2009/06/orwell-essays-64257-spain

Perspectives: Elsbeth Juda, photographer, on a life in pictures

Published 21 May 2009

My photographic career began relatively late, after I came to London as refugee from the Nazis.

I was born in 1911 in Darmstadt, Germany, where my father taught philosophy, and the house was full of books – but there were relatively few pictures.

I had spread my wings as a young woman by moving to Paris when I was 18, but I was married and living back in Germany when, one evening in 1933, my husband, Hans, was eating in a cafe near the newspaper where he worked. One of the other customers was an SS man who got up to leave without paying the bill.

A waitress who tried to challenge him was brushed aside. Hans stood up for her and the situation turned very ugly. There was a brief fight, which ended in Hans being given a summons to appear before a magistrate for insulting a member of the SS.

Having dinner at the house of a friend, who was high up in the interior ministry, Hans showed him the summons. As soon as he saw it he told us to stop eating, to leave that very moment, and to get out of the country. We went straight home, packed a suitcase and left for England.

Finding work as a married woman (in those days married women were supposed to stay at home) was difficult. Being a foreigner didn't help, either. Eventually I became a "darkroom boy" and got my lucky break when the company I worked for was given the commission to do a fashion shoot for a clothing catalogue.

The usual photographer was late returning from his holidays, so I was asked to stand in for him. The shoot was a success and I was called in to the manager's office and promoted to photographer.

Hans and I had many artistic friends, and I loved working with artists. One was Henry Moore, whom I photographed while he was at work on his sculpture *King and Queen*, to mark the 1953 coronation. His studio was like an industrial workshop.

A cosier environment – physically, though not emotionally – was Chartwell, the country house where I went to photograph Graham Sutherland, who was visiting Winston Churchill after being commissioned by parliament to paint his portrait. This was a disaster: Churchill hated the finished product and Lady Churchill later had it destroyed.

My photographs showed Graham at work, but also included some studies I took of Churchill, which Graham used to work from when he wasn't actually with his subject. They got off to a bad start when Graham turned up with a tiny notepad in which to make early sketches. Churchill was irritated: "Young man, you do not have the right kit!" And it went downhill from there.

I have always been interested in politics as well as the arts.

Because of my age, I have seen a huge amount of political change. As a child I was taken by my father to the main public square in Darmstadt to hear the news of the Kaiser's abdication. Father was pleased: he was a liberal who believed in democracy. He died in 1929, so was spared seeing the Republic usurped by the Nazis.

I have had exhibitions in Germany since the war and still have German friends, but England has been my home for over three quarters of a century.

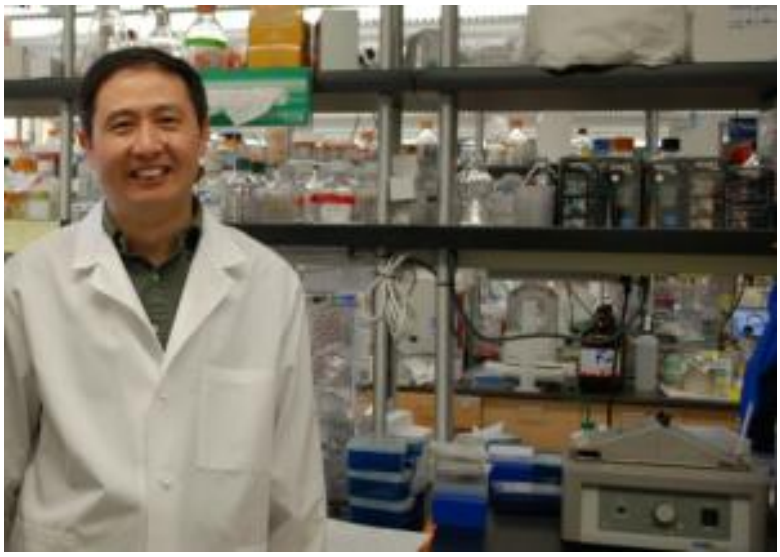
Hans fell in love with England the moment he saw the cliffs of Dover. When he died, I stopped taking photographs and made collages and paintings instead. But as we enter a new age of austerity, I have enjoyed revisiting the exhibition photographs I took in the original Austerity Britain, sixty years ago.

As told to by Paul Ibell

"Elsbeth Juda: Photographs 1940-1965" is at L'Équipement des Arts, 19 New Quebec Street, London W1, 11am-7pm daily, until 7 June

http://www.newstatesman.com/art/2009/05/hans-germany-churchill

Dental Researchers ID New Target In Fight Against Osteoporosis, Periodontitis



Dr. Cun-Yu Wang in the Laboratory of Molecular Signaling in the diivision of oral biology and medicine at the UCLA School of Dentistry. (Credit: Image courtesy of University of California - Los Angeles)

ScienceDaily (May 30, 2009) — Osteoporosis and periodontitis are common diseases whose sufferers must cope with weakness, injury and reduced function as they lose bone more quickly than it is formed. While the mechanism of bone destruction in these diseases is understood, scientists have had less information about how bone formation is impaired.

Now, researchers at the UCLA School of Dentistry, working with scientists at the University of Michigan and the University of California, San Diego, have identified a potential new focus of treatments for osteoporosis, periodontitis and similar diseases.

In a paper published May 17 in the online edition of the journal *Nature Medicine*, Cun-Yu Wang, who holds UCLA's No-Hee Park Endowed Chair in the dental school's division of oral biology and medicine, and colleagues suggest that inhibiting nuclear factor-κB (NF-κB), a master protein that controls genes associated with inflammation and immunity, can prevent disabling bone loss by maintaining bone formation.

The findings could offer new hope to millions who struggle with osteoporosis and periodontitis each year. The National Institutes of Health estimates that in the United States alone, more than 10 million people have osteoporosis, and many more have low bone mass, putting them at risk for the disease, as well as for broken bones. According to the American Academy of Periodontology, mild to moderate periodontitis affects a majority of adults, with between 5 and 20 percent of the population suffering from a more severe stage of the disease.

The NF-κB protein, a culprit in inflammatory and immune disorders, plays a major role in both osteoporosis and periodontitis, disrupting the healthy balance of bone destruction and formation. It is this balance that Wang and his fellow scientists seek to restore, and perhaps even improve upon, by finding new ways to promote net bone accumulation.

"Most studies focus on the part that NF-κB plays in the regulation of osteoclasts — bone-resorbing cells. For the past five years, we looked closely at the effect of NF-κB on osteoblasts — bone-forming cells," said Wang, the study's principal investigator and a member of UCLA's Jonsson Comprehensive Cancer Center. "We knew that NF-κB promoted resorption. What we discovered in our in vitro and in vivo

studies is that this protein also inhibits new bone formation, giving us a fuller picture of its role in inflammation and immune responses."

"This landmark paper by Dr. Wang and his colleagues is not only top-notch molecular science, but it also holds promise for clinicians trying to provide the most enlightened treatment of women with postmenopausal osteoporosis," said John Adams, a UCLA professor of orthopedic surgery. "The paper shows how the molecular manipulation of a previously unsuspected pro-inflammatory pathway in the bone-forming cell, the osteoblast, can regulate the capacity of that cell to make new bone."

Many currently available treatments work to prevent further bone loss but are not able to increase bone mass. Wang's research results support the idea that a new drug that prevents the action of NF-κB in cells may represent a major therapeutic advance.

"Although it has been known for some time that inflammation inhibits bone formation, the groundbreaking work by Dr. Wang and his colleagues elucidates the critical role of NF-κB in the mechanism that underlies this phenomenon," said Philip Stashenko, a professor at the Harvard School of Dental Medicine and president and CEO of the Forsyth Institute, an oral health treatment and research organization. "Many drugs that block NF-κB are in development, and these findings suggest that new treatments to preserve bone in periodontitis, osteoporosis and related bone diseases are imminent."

As a next step, Wang and his research team are planning to test small molecules that inhibit the specific bone-resorption and bone-inhibition actions of NF-κB in osteoporosis and periodontitis.

The study was supported by grants from the National Institute of Dental and Craniofacial Research and the National Institute of Diabetes and Digestive and Kidney Diseases.

Journal reference:

1. Chang et al. **Inhibition of osteoblastic bone formation by nuclear factor-κB**. *Nature Medicine*, 2009; DOI: 10.1038/nm.1954

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

http://www.sciencedaily.com/releases/2009/05/090519093943.htm

Ghost Remains After Black Hole Eruption

This is a composite image showing a small region of the Chandra Deep Field North. The diffuse blue object near the center of the image is believed to be a cosmic "ghost" generated by a huge eruption from a supermassive black hole in a distant galaxy. This X-ray ghost, a.k.a. HDF 130, remains after powerful radio waves from particles traveling away from the black hole at almost the speed of light, have died off. As the electrons radiate away their energy they produce X-rays by interacting with the pervasive sea of photons remaining from the Big Bang - the cosmic background radiation. (Credit: X-ray (NASA/CXC/IoA/A.Fabian et al.); Optical (SDSS), Radio (STFC/JBO/MERLIN))

ScienceDaily (May 29, 2009) — NASA's Chandra X-ray Observatory has found a cosmic "ghost" lurking around a distant supermassive black hole. This is the first detection of such a high-energy apparition, and scientists think it is evidence of a huge eruption produced by the black hole.

This discovery presents astronomers with a valuable opportunity to observe phenomena that occurred when the Universe was very young. The X-ray ghost, so-called because a diffuse X-ray source has remained after other radiation from the outburst has died away, is in the Chandra Deep Field-North, one of the deepest X-ray images ever taken. The source, a.k.a. HDF 130, is over 10 billion light years away and existed at a time 3 billion years after the Big Bang, when galaxies and black holes were forming at a high rate.

"We'd seen this fuzzy object a few years ago, but didn't realize until now that we were seeing a ghost", said Andy Fabian of the Cambridge University in the United Kingdom. "It's not out there to haunt us, rather it's telling us something - in this case what was happening in this galaxy billions of year ago."

Fabian and colleagues think the X-ray glow from HDF 130 is evidence for a powerful outburst from its central black hole in the form of jets of energetic particles traveling at almost the speed of light. When the eruption was ongoing, it produced prodigious amounts of radio and X-radiation, but after several million years, the radio signal faded from view as the electrons radiated away their energy.

However, less energetic electrons can still produce X-rays by interacting with the pervasive sea of photons remaining from the Big Bang - the cosmic background radiation. Collisions between these electrons and the background photons can impart enough energy to the photons to boost them into the X-ray energy band. This process produces an extended X-ray source that lasts for another 30 million years or so.

"This ghost tells us about the black hole's eruption long after it has died," said co-author Scott Chapman, also of Cambridge University. "This means we don't have to catch the black holes in the act to witness the big impact they have."

This is the first X-ray ghost ever seen after the demise of radio-bright jets. Astronomers have observed extensive X-ray emission with a similar origin, but only from galaxies with radio emission on large scales, signifying continued eruptions. In HDF 130, only a point source is detected in radio images, coinciding with the massive elliptical galaxy seen in its optical image. This radio source indicates the presence of a growing supermassive black hole.

"This result hints that the X-ray sky should be littered with such ghosts," said co-author Caitlin Casey, also of Cambridge, "especially if black hole eruptions are as common as we think they are in the early Universe."

The power contained in the black hole eruption was likely to be considerable, equivalent to about a billion supernovas. The energy is dumped into the surroundings and transports and heats the gas.

"Even after the ghost disappears, most of the energy from the black hole's eruption remains", said Fabian. "Because they're so powerful, these eruptions can have profound effects lasting for billions of years."

The details of Chandra's data of HDF 130 helped secure its true nature. For example, in X-rays, HDF 130 has a cigar-like shape that extends for some 2.2 million light years. The linear shape of the X-ray source is consistent with the shape of radio jets and not with that of a galaxy cluster, which is expected to be circular. The energy distribution of the X-rays is also consistent with the interpretation of an X-ray ghost.

NASA's Marshall Space Flight Center in Huntsville, Ala., manages the Chandra program for NASA's Science Mission Directorate in Washington. The Smithsonian Astrophysical Observatory controls Chandra's science and flight operations from Cambridge, Mass.

Adapted from materials provided by Chandra X-ray Center.

http://www.sciencedaily.com/releases/2009/05/090528110642.htm

Portrait of the Artist as a Young Data-Entry Supervisor

It's time for an ambitious new literature of the office

By Alain de Botton | May 31, 2009

Without quite grasping the extent of our debt, we rely on writers to help explain the world to us. It's they who give us a feel for what it's like to fall in love, who give us words for describing the landscape around us, and who help us interpret the dynamics of our families. Such is their power that we can name whole slices of experience with adjectives built of their names. We speak of encountering, sometimes in the most unlikely settings, dynamics most succinctly described as "Proustian," "Austenesque," and "Kafkan." Writers are our map-makers.

However, many contemporary writers are notably silent about a key area of our lives: our work. If a proverbial alien landed on earth and tried to figure out what human beings did with their time simply on the evidence of the literature sections of a typical bookstore, he or she would come away thinking that we devote ourselves almost exclusively to leading complex relationships, squabbling with our parents, and occasionally murdering people. What is too often missing is what we really get up to outside of catching up on sleep, which is going to work at the office, store, or factory.

It used to be a central ambition of novelists to capture the experience of working life. From Balzac to Zola, Dickens to Kafka, they evoked the dynamism and the beauty, the horror and the tedium of the workplace. Their books covered the same territory as is today featured at copious length in the financial pages of newspapers or in the breathless commentaries of the 24-hour newscasters, but their interest was not primarily financial. The goal was to convey the human side of commerce, where money is only one actor in a complex drama about our ambitions and reversals.

Yet today's writers seem to be losing their nerve. There has been an unfortunate inward turn. Attention, brilliant though it might be, too often falls merely on the domestic and the natural. Consider some of the great Booker Prize-winning fiction writers of the last two decades: Anne Enright, John Banville, Yann

Martel, Peter Carey, Kazuo Ishiguro - fine writers and deserving winners, yet all of them writing to one side of the working realm. The territory of the novel seems inevitably to be defined by the domestic subject matter tackled by Pulitzer Prize-winning writers like Anne Tyler or Michael Cunningham. When a new writer like Joshua Ferris does finally devote a novel to tracking the antics inside a corporation, the critical reaction is peculiar and telling: he attracts renown and praise for his courage in tackling the fresh and entirely unexpected subject matter of going to the office.

Beyond the page, work remains at the center of our identities. It is hard to have a conversation with a stranger for more than a few minutes before needing to ask, "What do you do?" - for herein lie clues not only to monetary status, but more broadly to one's entire outlook and character. The literary silence is puzzling and regrettable, for it denies us the chance collectively to honor the excitement of work as well as to reconcile ourselves (through laughter and tragedy) to its inequities.

The reasons for this neglect are not to hard to guess at. Firstly, there is a problem of experience. Young writers are always advised to write of what they know about, and such is the specialized and dedicated nature of the modern economy that it can be very hard to know of anything besides what it's like to be a writer. Our authors know about casual jobs taken while waiting for a manuscript to be looked at in New York, but they are less familiar with a 40-year-long view down the tunnel of a career.

To compound the issue, it's become extraordinarily challenging to get into businesses in order to write about them. Most now employ squadrons of PR staff, who let in only handpicked financial journalists and assiduously reject suspect poets or novelists who might cause trouble. When writing my latest book exploring workplaces with a novelistic eye, I had 20 rejections for every one acceptance. I was asked if I might sign non-disclosure forms and later send my text in to be checked by in-house lawyers (I politely refused).

But there is perhaps an even greater, and more regrettable reason for the curious non-appearance of the working world in art, namely the belief that work simply isn't an interesting subject. The workplace is thought to be merely a place for degrading and banal labor out of which no one could spin anything of value other than (at best) a satirical or nihilistic commentary. This is connected to the fact that much modern work has become white-collar work, almost totally without obvious heroism or romanticism. Farming, fighting, building - these are rich in anecdotes and color, they are the stuff of children's tales. Less so website optimization and telephone customer management. It is hard to turn the latter into stories. We cannot easily "see" the interest. But that is not to say it doesn't exist - no less than that it was hard for readers to see the interest of an ordinary afternoon in London until Virginia Woolf pointed it out for them, or to note the manifold richness of the act of going to sleep until Proust started to write.

If much of life's value rests in work, and if novelists are concerned with forging a literature of meaning rather than romance or aesthetic gestures, then they should turn their eyes to material quite unlike what we imagine stories could be weaved from. It would be literature alive to new varieties of sensory deprivation, melancholy, boredom, passion, eroticism, vindictiveness, charity, triviality, and seriousness. It would be a literature, in other words, that properly wrestled with our modern condition, helping us to understand and properly inhabit it.

This new genre would not only invigorate literature, it would more broadly enrich our lives, for the result of the literary silence has been a form of alienation from the working process - and in turn from the whole material realm. We may know the sliver of the working world that we ourselves occupy, but the wider picture grows obscure. Two centuries ago, our forebears would have known the precise history and source of almost every one of the limited number of things they ate and owned. They would have been familiar with the pig, the carpenter, the weaver, the loom, and the dairy maid.

The range of items available for purchase may have grown exponentially since then, but our understanding of their genesis has grown ever more unclear. We are now as imaginatively disconnected from the production and distribution of our goods as we are practically in reach of them, a process of alienation that has stripped us of opportunities for wonder, gratitude, and guilt. There is a whole manmade

landscape that has a richness we simply miss. Behind a modern bag of frozen corn is a wealth of human stories every bit as rich and surprising as the more easily graspable labor behind an ear of corn.

In an essay entitled "The Poet," published in 1844, Ralph Waldo Emerson lamented the narrow definition of interest subscribed to by his peers, who tended to reserve the term poetry exclusively for the bucolic landscapes and unspoilt pastoral scenes celebrated in the works of well-known, usually European, artists and poets of the past. Emerson, however, saw himself as a citizen of a new commercial nation, observing with interest the proliferation of railways, warehouses, canals, and factories, and wished to make room for the possibility of alternative artistic subjects. He contrasted the nostalgic devotees of old-fashioned poetry with those whom he judged to be true contemporary poetic spirits. The former camp, he averred, "see the factory-village and the railway, and fancy that the beauty of the landscape is broken up by these, for they are not yet consecrated in their reading. But the true poet sees them fall within the great order of nature not less than the beehive or the spider's geometrical web. Nature adopts them very fast into her vital circles, and the gliding train of cars she loves like her own."

In certain arts, Emerson's point has been thoroughly explored: think of the stunning photographs of water towers by the Bechers, or the factories of Andreas Gursky. But the literary world is still waiting for its equivalents.Readers who look for their curiosity to be sated aren't offered the same kind of engagement. Hence how ignorant most of us are, surrounded by machines and processes of which we have only the loosest grasp; we who know nothing about gantry cranes and iron-ore bulk carriers and amortization, who register the economy only as a set of numbers, who think - even now - that it is only about money.

Naturally, non-work themes are eternal and essential. Shakespeare wrote mainly about relationships and murders. Jane Austen cleaved closely to the domestic. Yet at a time when recession is reminding us how badly we rely on work, it should be artists who teach us to discern its pleasures and sorrows. We need an art that could function for our times a little like those 18th-century cityscapes that show us people at work from the quayside to the temple, the parliament to the counting house, panoramas like those of Canaletto in which, within a single giant frame, one can witness dockworkers unloading crates, merchants bargaining in the main square, bakers before their ovens, women sewing at their windows, and councils of ministers assembled in a palace - inclusive scenes that serve to remind us of the place that work accords each of us within the human hive.

We need an art that can proclaim the intelligence, peculiarity, beauty, and horror of the workplace and, not least, its extraordinary claim to be able to provide us, alongside love, with the principal source of life's meaning.

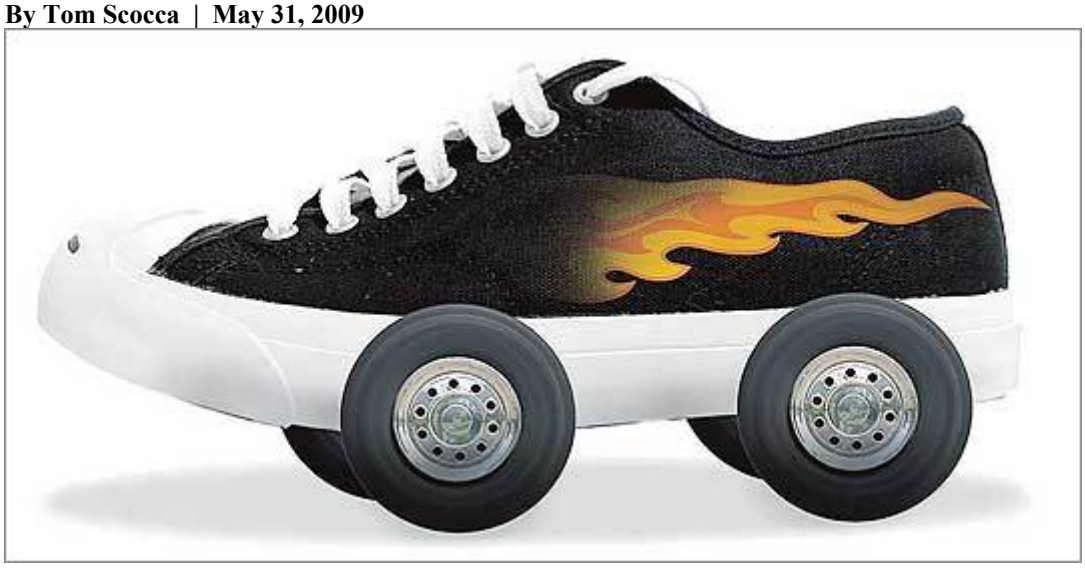
Alain de Botton's new book is "The Pleasures and Sorrows of Work," published by Pantheon Books. He is giving a lecture at the Institute of Contemporary Art on Sunday, June 7, at 2:30 p.m. (www.icaboston.org). ■

http://www.boston.com/bostonglobe/ideas/articles/2009/05/31/its_time_for_an_ambitious_new_literature_of_the_workplace/

The downward spiral of progress

Why companies keep ruining your favorite products

By Tom Scocca | May 31, 2009



FOR MORE THAN a decade, starting nearly 20 years ago, I believed that I would never need to think about buying sneakers again. When I needed new sneakers, I simply went to a suitable shoe store and found a pair of Jack Purcell sneakers, size 12, a clean white replica of the dirty and fraying shoes I'd worn into the store.

The badminton champion Jack Purcell had designed them in the 1930s: plain canvas, long rows of metal eyelets, a white rubber cap toe, a flat blue sole, and a correspondingly flat canvas insole. The shoe had survived through whole epochs of modern shoe design, secure in its atavistic simplicity, like a horseshoe crab. It was handsome and comfortable.

Then, a few years ago, the shoes were gone. In their place was something that almost looked like them - cap toe, eyelets, canvas - but, in the words of the manufacturer Converse, had been "reinvented with a ½-inch thick comfort insole, lightly padded tongue and upper sockliner....along with a redesigned outsole for added comfort."

Whose comfort? There were already plenty of sneakers out there with padded soles and tongues; if I'd wanted them, I would have bought them. In the name of making the shoes better, they had made them into something else. The Jack Purcell sneaker had been improved out of existence.

There are plenty of criticisms of American consumer capitalism and its guiding ideology, the notion that the Invisible Hand of the Market is as all-capable as the hand of God used to be (back when God was what people worshipped), only more helpful and efficient. It's not hard to spot cases where the market is inadequate to answer moral or ethical questions, such as how to pay to fix an 83-year-old retiree's broken hip.

But consumer capitalism is also a disappointment at the thing it's supposed to be good at: the ordinary buying and using of stuff. It's especially frustrating when the market decides to improve something that customers didn't want improved. If the consumer marketplace allows useful, effective products to disappear, then what is it good for? Or who is it good for? Not the person who's buying.

On June 12, after one last round of delays, the last analog television signals in America are due to be cut off. People who were happy watching old-fashioned television with rabbit ears - the most frugal, least

demanding television customers in America - will have either bought a digital converter kit or they will see their pictures go dark.

The government's TV-transition website assures the analog-TV holdouts that "digital broadcasting allows stations to offer improved picture and sound quality." This is debatable: where you might watch a weak analog signal on a snowy screen, a digital signal would go blank or curdle into unwatchable, unmoving pixel-chunks. And because digital signals take longer to digest, it will become impossible to flip instantly from channel to channel - a maddening lag I first encountered on digital cable, after my provider insisted on upgrading me. But digital is officially better, so everyone gets digital.

This sort of ruination-through-improvement has a rich history. The most notorious example was the introduction of New Coke, when Coca-Cola announced it was replacing its ubiquitous, wildly popular flagship beverage - an avatar of American capitalist culture around the world - with a new version that people would like better. No one wanted New Coke, and it was quickly withdrawn, to be remembered as a humiliating failure.

What's mostly forgotten, though, is that old-fashioned Coca-Cola never came back. What replaced New Coke was a drink called Coca-Cola Classic - made, like New Coke, with cheaper and more cloying high-fructose corn syrup in place of cane sugar. Now, people who care enough to want the actual, white-sugar taste of Coke end up hunting for foreign bottlings or hoarding the corn-free Passover version.

Things like New Coke, digital TV, and the smaller, easier-to-handle daily newspaper are all changes meant to make things easier or more profitable for the producer, which are presented to the consumer as improvements. As Facebook grows from a social-networking site to a data-mining site for marketers, the home page becomes a gabble of personality quizzes taken by people you haven't seen since high school. The bait-and-switch is crude and obvious.

More insidious are the disimprovements through which the producer genuinely believes it's making its product more attractive. Why, one day in the '90s, did a capering anthropomorphic paper clip start jumping out at you when you tried to write a letter in Microsoft Word? Why did a particular brand of toilet paper - and in short order, nearly every brand of toilet paper - turn crumbly and linty in the name of "extra softness"? Why does the first Star Wars movie now teem with swarms of excess spaceships, computer-pasted onto the original scenes?

It's not that everything old is inherently better. A piezoelectric starter on your stove beats a pilot light. I don't miss rotary phones, carbon paper, cloth diapers, or dial-up modems. I would rather send you a text message than talk to you on the phone (although that's partly because the lack of an old-fashioned analog feedback loop makes cellphones annoying to talk on).

When a product gets disimproved, the company behind it is trying to give you more - but not you, personally, exactly. Someone else, some other person, who still must be wooed. The satisfied customer, his or her needs having already been accounted for, can be dispensed with; it's the dissatisfied customer, who still wants to buy things, who makes the system run. The moment you're comfortable enough to stop thinking about your choice is the moment your choice is most likely to be yanked away from you.

This is the source of the auto-industry truism that any small, lean car will inevitably evolve, model year after model year, into a bloatmobile. The people who didn't buy it in the first place would prefer something a little bigger, a little more like a regular car. The Ford Thunderbird, a little two-seater in 1955, acquired over the next 20 years a full set of seats, four feet of length, and nearly a ton of extra weight. The Scion xB, an American-market version of Japan's popular box-shaped economy wagons, just bulked up and dropped below 30 mpg - the better to attract people who prefer SUVs to Japanese economy cars.

So it was that when I went to replace my old MacBook, the smallest and most portable model, I learned that the new smallest model was an inch bigger. Apple wanted to give people a wider screen, the sales clerk said. That there were already wider models didn't matter.

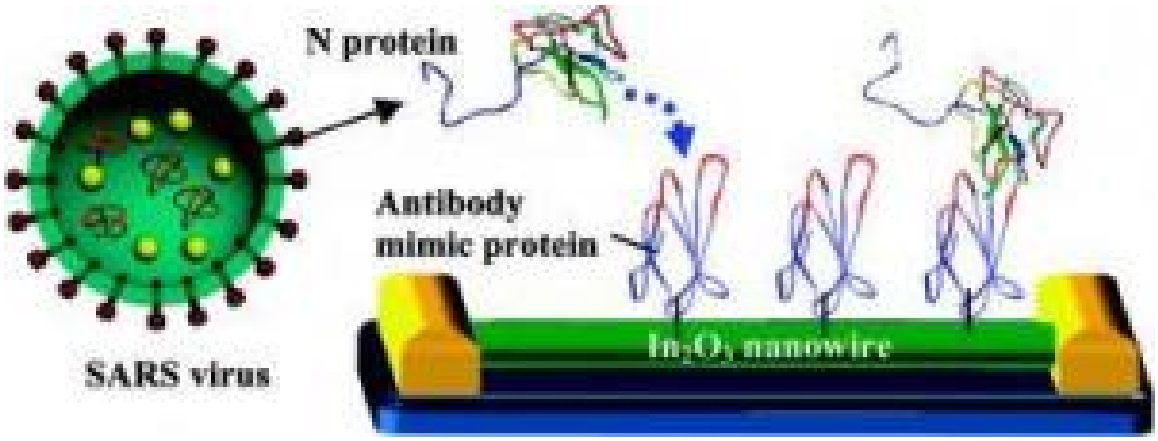
Sometimes the market really will correct itself, as the economists promise, reversing a disimprovement, or even coming up with an improvement. No-boil lasagna noodles, with their weird parchment-y texture, seemed to have driven all the real lasagna noodles off the shelves a few years ago; now the normal product has made a comeback. If you pay a little extra when buying a Windows computer, they'll strip out the Vista operating system and let you have a plain, older version. Soft-drink makers are formulating specialty products with sugar instead of corn syrup.

But mostly, unwanted progress is here to stay. The market can't be trusted to keep supplying you with what you like, because the goal of the market is not to have sold things but to be selling more things, tomorrow. It's not about the loyal customer, but the one whose loyalty still needs to be negotiated - on new terms, if need be. The loyalty of the old customers is strictly one-way. The ideal customer is someone who doesn't want the product.

Tom Scocca is working on a new book, "Beijing Welcomes You," from Riverhead Books. ■

http://www.boston.com/bostonglobe/ideas/articles/2009/05/31/the_downward_spiral_of_progress/

Quicker, Cheaper SARS Virus Detector -- One Easily Customizable For Other Targets



Antibody mimic protein is tailored to attach to nanowire base at one end, leaving biologically active area open for detection. (Credit: University of Southern California)

ScienceDaily (June 1, 2009) — Members of a USC-led research team say they've made a big improvement in a new breed of electronic detectors for viruses and other biological materials — one that may be a valuable addition to the battle against epidemics.

It consists of a piece of synthetic antibody attached to a nanowire that's attached to an electrical base, immersed in liquid.

If the protein the antibody binds to is present in the liquid, it will bind to these antibodies, immediately creating a sharply measurable jump in current through the nanowire.

The basic principle of nanotube and nanowire biosensors for protein detection was first demonstrated in 2001, but the new design by a team headed by Zhongwu Chou and Mark Thompson of the University of Southern California uses two new elements.

First, it takes advantage of bioengineered synthetic antibodies, much, much smaller versions of the natural substances that are designed to bind with a specific protein and only that protein.

Second, it uses indium oxide (In2O3) nanowires instead of silicon and other materials previously tried. Metal oxides, according to a new study published in *ACS Nano*, do not, unlike silicon, develop "an insulating native oxide layer that can reduce sensitivity."

The result, according to the paper, is a device that can detect its target molecules with a sensitivity as great as the best alternative modes, do so more rapidly and without use of chemical reagents.

It is also potentially considerably cheaper than alternatives.

"We believe," the authors write, "that nanowire bisensor devices functionalized with engineered proteins … can have important applications ranging from disease diagnosis to homeland security."

Additionally, the system can be useful in basis research, in helping to establish certain important parameters for two-part biological systems like the antibody/target protein pair.

The protein the prototype system detects is the SARS (severe acute respiratory syndrome) virus n-protein, which infected more than 8,000 people in 2002-2003, killing nearly 10 percent of them.

Commercial systems using enzyme-linked immunosorbent assay (ELISA) now exist to test for SARS, but the new system has advantages in time, cost and portability.

The first step was the creation, by Richard Roberts and Mark Thompson, chemists, and their team of the synthetic antibody, including both the active area, design to interact with the protein and, at the other end, a chemical "hook" that would bind it to nanowire at this point and only this point. "This … strategy allows every bound [detector molecule] to retain full activity, a clear advantage over antibodies, which [in earlier biosensor designs] are often bound to nanowire surface via amine containing residues randomly distributed over the antibody surface."

The Zhou lab, which has specialized in nanowire and nanotube technology for years, performed the complex set of procedures to synthesize the wires, attachingIn tests, the group performed if anything better than predictions, showing a standard and low level of activity when no SARS protein was present, leaping quickly to a higher level when the protein was introduced, in response patterns that varied consistently according to concentration of the SARS protein. Devices complete except for the detector molecule showed no response at all.

The response was complete in less than ten minutes, compared to hours needed for results from ELISA tests - which are basically present/not present tests with relatively little quantitative elements.Next steps are to enable detection in more complex environment, such as Serum and whole blood, by integrating the nanobiosensor with micro systems such as microfluidics chips and micro filters.

The USC team believes their new system has potential to be cheaper and more portable than either.

In addition to Zhou (from the Viterbi School's Ming Hsieh Department of Electrical Engineering) and Thompson (of the USC College Department of Chemistry), the team included Fumiaki Ishikawa, Hsaio-Kang Chang, Po-Ching Chen from Electrical Engineering; Marco Curreli, Rui Zhang, Richard W. Roberts and C. Anders Olson from Chemistry, Richard J. Cote of the Keck School of Medicine at USC Department of Pathology, and Hsiang-I Liao and Ren Sun of the UCLA Department of Medical Pharmacology.

The Whittier Foundation and the National Institutes of Health funded the research.

Journal reference:

1. Fumiaki N. Ishikawa, Hsiao-Kang Chang, Marco Curreli, Hsiang-I Liao, C. Anders Olson, Po-Chiang Chen, Rui Zhang, Richard W. Roberts, Ren Sun, Richard J. Cote, Mark E. Thompson and Chongwu Zhou. **Label-Free, Electrical Detection of the SARS Virus N-Protein with Nanowire Biosensors Utilizing Antibody Mimics as Capture Probes**. *ACS Nano*, 2009; 3 (5): 1219 DOI: 10.1021/nn900086c

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

http://www.sciencedaily.com/releases/2009/05/090529093152.htm

Chicken Meat: Organic Acids, Plant Extracts And Irradiation Combine To Beat The Bacteria

A mixture of some organic acids and some extracts from plants turns out to be enough to greatly reduce pathogenic bacteria on chicken breast meat. Add some irradiation to the mix and it makes a lethal combination against the bacteria. (Credit: iStockphoto)

ScienceDaily (June 1, 2009) — A mixture of some organic acids and some extracts from plants turns out to be enough to greatly reduce pathogenic bacteria on chicken breast meat. Add some irradiation to the mix and it makes a lethal combination against the bacteria.

Food Safety Consortium researchers at the University of Arkansas System's Division of Agriculture found that they could greatly reduce *E. coli O157:H7*, *Listeria monocytogenes* and *Salmonella Typhimurium* in the chicken breast meat by infusing combinations of organic acids – acetic, citric, lactic, malic and tartaric – into the meat. The experiments were also performed with extracts from green tea and grape seeds in combination with the acids.

Three of the organic acids – malic, citric and tartaric – were most effective against *S. Typhimurium* and *E. coli O157:H7*, more than against *L. monocytogenes*. With irradiation factored in, the results were significant against all the pathogens.

"We want to determine the least amount of plant extracts that we can use and the least amount of irradiation dosage to get the best inhibitory effect," said Navam Hettiarachchy, a UA food science professor who supervised the project.

Previous research by Hettiarachchy's research team showed that extracts from grape seed and green tea reduced *L. monocytogenes* to undetectable levels when applied in combination with nisin, a bacteriocin recognized as a safe food preservative.

The researchers are also using the plant extracts to serve as antioxidants, which minimizes lipid oxidation. Lipid oxidation is a process that causes meat quality to deteriorate by adversely affecting characteristics such as flavor, color and texture.

Hettiarachchy said the research team has examined the effects of irradiation on the chicken's color and texture and found no significant change.

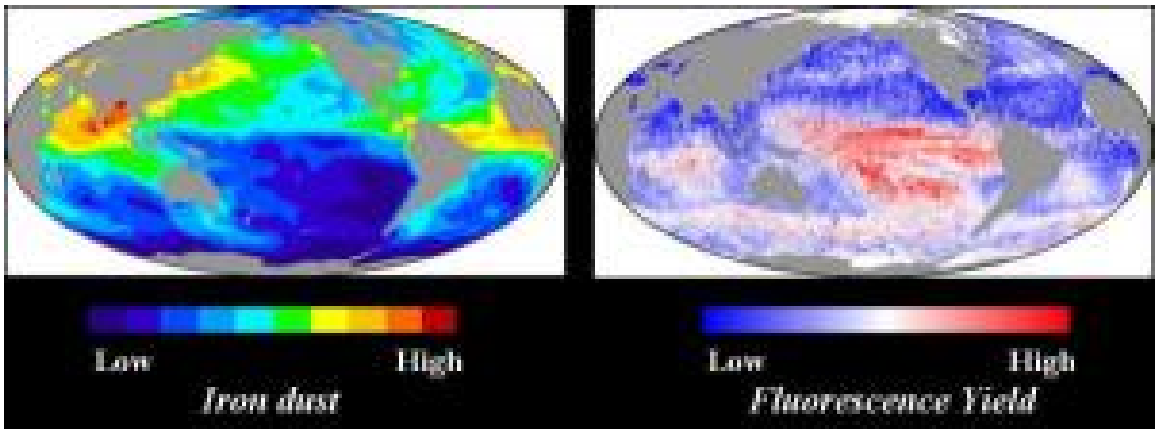
The research is continuing, but Hettiarachchy said a poultry company has already expressed interest in the project's findings. Irradiation, however, has not yet been applied widely in the United States as many companies have worried about potential resistance among consumers.

Hettiarachcy suggested that labels on irradiated products could have a brief explanation of irradiation to educate consumers.

"I am hopeful that with time the public will become aware of irradiation processing so that they accept irradiation in processing poultry and meat products for safety against pathogens," Hettiarachchy said. "A new education component is very important and may be the key for acceptance for irradiated food products by the consumer."

Adapted from materials provided by University of Arkansas, Food Safety Consortium, via Newswise.
http://www.sciencedaily.com/releases/2009/05/090527175333.htm

Satellite Detects Red Glow To Map Global Ocean Plant Health



A digital image showing how the input of iron into marine ecosystems can affect phytoplankton growth in the oceans. (Credit: Image courtesy of Oregon State University)

ScienceDaily (June 1, 2009) — Researchers from Oregon State University, NASA and other organizations said today that they have succeeded for the first time in measuring the physiology of marine phytoplankton through satellite measurements of its fluorescence – an accomplishment that had been elusive for years.

With this new tool and the continued use of the MODIS Aqua satellite, scientists will now be able to gain a reasonably accurate picture of the ocean's health and productivity about every week, all over the planet.

Data such as this will be critically important in evaluating the effect on oceans of global warming, climate change, desertification and other changes, the researchers said. It will also be a key to determining which areas of the ocean are limited in their productivity by iron deficiency – as this study just showed the Indian Ocean was.

"Until now we've really struggled to make this technology work and give us the information we need," said Michael Behrenfeld, an OSU professor of botany. "The fluorescence measurements allow us to see from outer space the faint red glow of tiny marine plants, all over the world, and tell whether or not they are healthy. That's pretty cool."

Ocean phytoplankton are single-celled organisms that are responsible for half of the photosynthetic productivity on Earth. They fuel nearly all marine ocean ecosystems and are the base of the marine food chain.

Measurements of phytoplankton are an important way to understand the broader health and productivity of the ocean, researchers say. Some of the measurements available prior to this, such as phytoplankton biomass or their carbon-to-chlorophyll ratio, provided part of the picture, but were often only available for tiny portions of the ocean at a time.

To grow, however, these phytoplankton absorb energy from the sun, and then allow some of that energy to escape as red light that is called fluorescence. The new measurements of fluorescence, literally the dim glow that these plants put off, will help complete the understanding of ocean health on a much broader and more frequent basis.

Some surprises are already in.

It was known, for instance, that parts of the equatorial Pacific Ocean, some regions around Antarctica and parts of the sub-Artic Pacific Ocean below Alaska were limited in production by the poor availability of iron. The newest data, however, show that parts of the northern Indian Ocean during the summer are also iron limited – a phenomenon that had been suggested by some ocean and climate models, but never before confirmed.

"Iron is often brought to the oceans by dust coming off terrestrial regions, and is a necessary nutrient that often limits the potential for marine phytoplankton growth," said Allen Milligan, an OSU assistant professor of botany and co-author of this study, which is being published in the journal *Biogeosciences*.

"If forces such as global warming, circulation changes or the growth of deserts change the amount of dust entering the oceans, it will have an impact on marine productivity," Milligan said. "Now we'll be able to track those changes, some of which are seasonal and some of which may happen over much longer periods of time. And we'll also be able to better assess and improve the climate models that have to consider these phenomena."

Funding for this research was provided by the Ocean Biology and Biogeochemistry Program of NASA, which announced the findings in a news conference. Other collaborators were from the University of Maine/Orono, University of California/Santa Barbara, University of Southern Mississippi, the NASA Goddard Space Flight Center, Woods Hole Oceanographic Institution, Cornell University, and the University of California/Irvine.

In continued studies, researchers at OSU hope to reproduce the marine environment that these phytoplankton cells live in, learn more about their basic biology and better understand why and how they can be seen from space. Further research may also explore how the oceans might respond to iron enrichment.

Journal reference:

1. Behrenfeld et al. **Satellite-detected fluorescence reveals global physiology of ocean phytoplankton**. *Biogeosciences*, 2009; [link]

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

http://www.sciencedaily.com/releases/2009/05/090528135242.htm

First Complete X-ray View Of A Galaxy Cluster

The massive radio galaxy PKS 0745-191, for which the cluster is named, appears at the center of this Hubble Space Telescope image. (Credit: NASA/STScI/Fabian, et al.)

ScienceDaily (May 31, 2009) — The joint Japan-U.S. Suzaku mission is providing new insight into how assemblages of thousands of galaxies pull themselves together. For the first time, Suzaku has detected X-ray-emitting gas at a cluster's outskirts, where a billion-year plunge to the center begins.

"These Suzaku observations are exciting because we can finally see how these structures, the largest bound objects in the universe, grow even more massive," said Matt George, the study's lead author at the University of California, Berkeley.

The team trained Suzaku's X-ray telescopes on the cluster PKS 0745-191, which lies 1.3 billion light-years away in the southern constellation Puppis. Between May 11 and 14, 2007, Suzaku acquired five images of the million-degree gas that permeates the cluster.

By looking at a cluster in X-rays, astronomers can measure the temperature and density of the gas, which provides clues about the gas pressure and total mass of the cluster. Astronomers expect that the gas in the inner part of a galaxy cluster has settled into a "relaxed" state in equilibrium with the cluster's gravity. This means that the hottest, densest gas lies near the cluster's center, and temperatures and densities steadily decline at greater distances.

In the cluster's outer regions, though, the gas is no longer in an orderly state because matter is still falling inward. "Clusters are the most massive, relaxed objects in the universe, and they are continuing to form now," said team member Andy Fabian at the Cambridge Institute of Astronomy in the UK. The distance where order turns to chaos is referred to as the cluster's "virial radius."

For the first time, this study shows the X-ray emission and gas density and temperature out to -- and even beyond -- the virial radius, where the cluster continues to form. "It gives us the first complete X-ray view of a cluster of galaxies," Fabian said.

In PKS 0745-191, the gas temperature peaks at 164 million degrees Fahrenheit (91 million C) about 1.1 million light-years from the cluster's center. Then, the temperature declines smoothly with distance, dropping to 45 million F (25 million C) more than 5.6 million light-years from the center. The findings appear in the May 11 issue of Monthly Notices of the Royal Astronomical Society.

To discern the cluster's outermost X-ray emission requires detectors with exceptionally low background noise. Suzaku's advanced X-ray detectors, coupled with a low-altitude orbit, give the observatory much lower background noise than other X-ray satellites. The low orbit means that Suzaku is largely protected by Earth's magnetic field, which deflects energetic particles from the sun and beyond.

"With more Suzaku observations in the outskirts of other galaxy clusters, we'll get a better picture of how these massive structures evolve," added George.

Suzaku ("red bird of the south") was launched on July 10, 2005. The observatory was developed at the Japanese Institute of Space and Astronautical Science (ISAS), which is part of the Japan Aerospace Exploration Agency (JAXA), in collaboration with NASA and other Japanese and U.S. institutions.

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

http://www.sciencedaily.com/releases/2009/05/090528120655.htm

Why Can We Talk? 'Humanized' Mice Speak Volumes About Evolutionary Past

Mice still can't make phone calls. But new research shows that mice carrying a "humanized version" of a gene believed to influence speech and language reveals important new insights into our evolutionary past. (Credit: iStockphoto/Emilia Stasiak)

ScienceDaily (May 31, 2009) — Mice carrying a "humanized version" of a gene believed to influence speech and language may not actually talk, but they nonetheless do have a lot to say about our evolutionary past, according to a report in the May 29th issue of the journal *Cell*, a Cell Press publication.

"In the last decade or so, we've come to realize that the mouse is really similar to humans," said Wolfgang Enard of the Max-Planck Institute for Evolutionary Anthropology. "The genes are essentially the same and they also work similarly." Because of that, scientists have learned a tremendous amount about the biology of human diseases by studying mice.

"With this study, we get the first glimpse that mice can be used to study not only disease, but also our own history."

Enard said his team is generally interested in the genomic differences that set humans apart from their primate relatives. One important difference between humans and chimpanzees they have studied are two amino acid substitutions in FOXP2. Those changes became fixed after the human lineage split from chimpanzees and earlier studies have yielded evidence that the gene underwent positive selection. That evolutionary change is thought to reflect selection for some important aspects of speech and language.

"Changes in FOXP2 occurred over the course of human evolution and are the best candidates for genetic changes that might explain why we can speak," Enard said. "The challenge is to study it functionally."

For obvious reasons, the genetic studies needed to sort that out can't be completed in humans or chimpanzees, he said. In the new study, the researchers introduced those substitutions into the FOXP2 gene of mice. They note that the mouse version of the gene is essentially identical to that of chimps, making it a reasonable model for the ancestral human version.

Mice with the human FOXP2 show changes in brain circuits that have previously been linked to human speech, the new research shows. Intriguingly enough, the genetically altered mouse pups also have

qualitative differences in ultrasonic vocalizations they use when placed outside the comfort of their mothers' nests. But, Enard says, not enough is known about mouse communication to read too much yet into what exactly those changes might mean.

Although FoxP2 is active in many other tissues of the body, the altered version did not appear to have other effects on the mice, which appeared to be generally healthy.

Those differences offer a window into the evolution of speech and language capacity in the human brain. They said it will now be important to further explore the mechanistic basis of the gene's effects and their possible relationship to characteristics that differ between humans and apes.

"Currently, one can only speculate about the role these effects may have played during human evolution," they wrote. "However, since patients that carry one nonfunctional FOXP2 allele show impairments in the timing and sequencing of orofacial movements, one possibility is that the amino acid substitutions in FOXP2 contributed to an increased fine-tuning of motor control necessary for articulation, i.e., the unique human capacity to learn and coordinate the muscle movements in lungs, larynx, tongue and lips that are necessary for speech. We are confident that concerted studies of mice, humans and other primates will eventually clarify if this is the case."

Journal reference:

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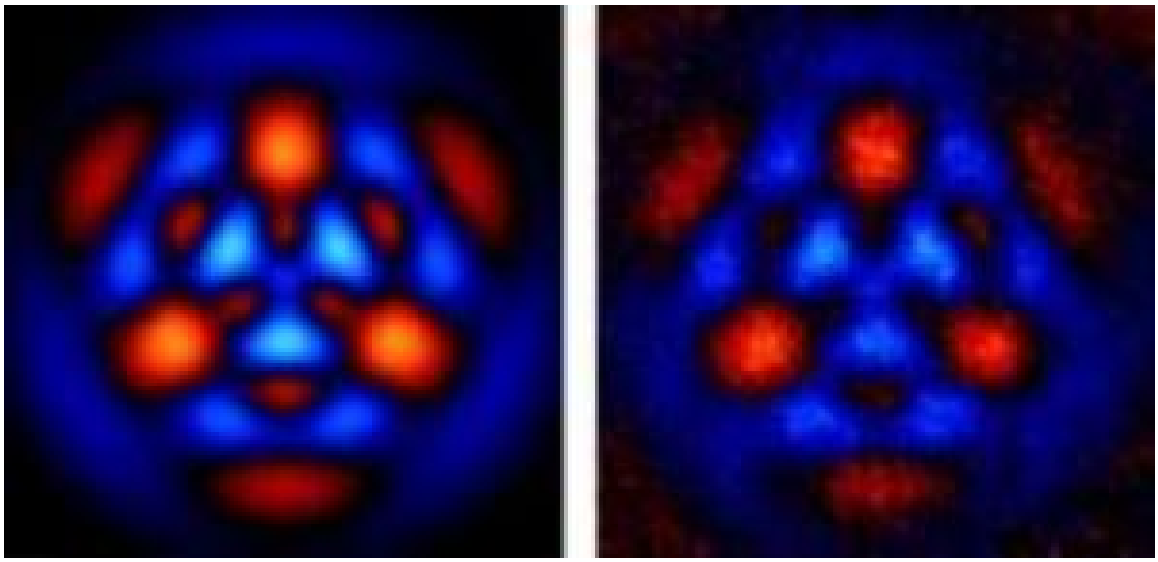
Adapted from materials provided by Cell Press, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090528120643.htm

Breakthrough In Quantum Control Of Light: Implications For Banking, Drug Design, And More



This image represents a quantum state with zero, three and six photons simultaneously. The theory is on left and the experiment is on the right. (Credit: UCSB)

ScienceDaily (May 31, 2009) — Researchers at UC Santa Barbara have recently demonstrated a breakthrough in the quantum control of photons, the energy quanta of light. This is a significant result in quantum computation, and could eventually have implications in banking, drug design, and other applications.

In a paper published in the journal *Nature*, UCSB physics researchers Max Hofheinz, John Martinis, and Andrew Cleland document how they used a superconducting electronic circuit known as a Josephson phase qubit to prepare highly unusual quantum states using microwave-frequency photons. The breakthrough is the result of four years of work in the laboratories of Cleland and Martinis.

The project is funded by the federal agency called the Intelligence Advanced Research Projects Activity, or IARPA. The government is particularly interested in quantum computing because of the way banking and other important communications are currently encrypted. Using large numbers, with hundreds of digits, encryption codes are changed daily and would take years of traditional computing to break. Quantum computing could potentially break those codes quickly, destroying current encryption schemes.

In the experiments, the photons were stored in a microwave cavity, a "light trap" in which the light bounces back and forth as if between two mirrors. In earlier work, these researchers showed they could create and store photons, one at a time, with up to 15 photons stored at one time in the light trap. The research shows that they can create states in which the light trap simultaneously has different numbers of photons stored in it. For example, it can simultaneously have zero, three, and six photons at the same time. Measuring the quantum state by counting how many photons are stored forces the trap to "decide" how many there are; but prior to counting, the light trap exists in a quantum superposition, with all three outcomes possible.

Explaining the paradoxical simultaneity of quantum states, Cleland said that it's like having your cake and eating it — at the same time.

"These superposition states are a fundamental concept in quantum mechanics, but this is the first time they have been controllably created with light," Cleland said. Martinis added, "This experiment can be thought of as a quantum digital-to-analog converter." As digital-to-analog converters are key components

in classical communication devices (for example, producing the sound waveforms in cell phones), this experiment might enable more advanced communication protocols for the transmission of quantum information.

First author Hofheinz designed and performed the measurements. He is a postdoctoral researcher from Germany who has been working at UCSB for the last two years on this project. The devices used to perform the experiment were made by Haohua Wang, a postdoctoral researcher from China, who is second author on the Nature publication.

The scientists said their research is leading to the construction of a quantum computer, which will have applications in information encryption and in solving or simulating problems that are not amenable to solution using standard computers.

Journal reference:

1. Max Hofheinz, H. Wang, M. Ansmann, Radoslaw C. Bialczak, Erik Lucero, M. Neeley, A. D. O'Connell, D. Sank, J. Wenner, John M. Martinis & A. N. Cleland. **Synthesizing arbitrary quantum states in a superconducting resonator**. *Nature*, 2009; 459 (7246): 546 DOI: 10.1038/nature08005

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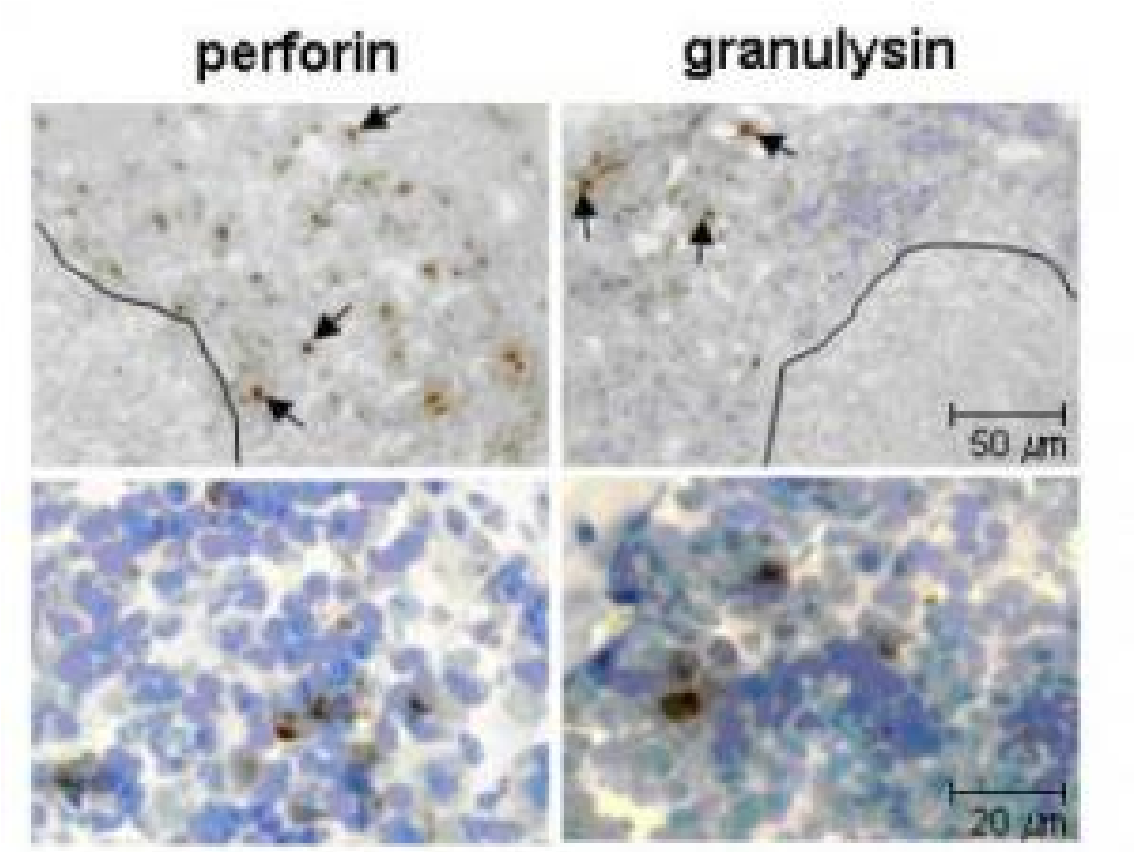
http://www.sciencedaily.com/releases/2009/05/090529093155.htm

TB -- Hiding In Plain Sight



Low levels of the anti-TB effector molecules perforin and granulysin in the granulomas (sold line) of a human TB-infected lymph node. Note the granular and polarized expression of the cytolytic effector molecules in cells located outside the lesions. (Credit: Rahman et al, 2009)

ScienceDaily (May 31, 2009) — Current research suggests that Mycobacterium tuberculosis can evade the immune response.

More than two million people worldwide die from tuberculosis infection every year. Due in part to inappropriate antibiotic usage, there are a rising number (0.5 million in 2007) of cases of multidrug-resistant (MDR-TB) and extensively drug-resistant (XDR-TB) tuberculosis. New therapies are needed to treat these dangerous infections.

Immune responses to tuberculosis rarely result in complete eradication of the infection. Instead, TB-infected immune cells promote the generation of chronic inflammation and the formation of granulomas, which are areas where the bacteria are contained but not destroyed. A group led by Dr. Susanna Grundstrom Brighenti at the Karolinska Institutet in Stockholm, Sweden therefore examined the immune response in patients infected with tuberculosis.

This is the first study describing the immunoregulatory mechanism associated with the development of clinical disease at the site of infection in human TB. They found that while the immune cells responsible for killing the tuberculosis bacteria surrounded the granuloma, these cells had low levels of the molecules necessary to kill the TB. Instead, granulomas had high numbers of regulatory immune cells. These regulatory cells suppress the immune response, resulting in the survival of the tuberculosis bacteria and perhaps contributing to persistent long-term infection.

This study by Rahman et al "provide[s] evidence that the adaptive immune response in establishment of clinical TB [is] skewed towards a suppressive or regulatory phenotype that may inhibit proper immune activation and down-regulate the host response at the local site of infection. Compartmentalization of the immune response in human TB could be part of the reason why infection is never completely eradicated but instead develops into a chronic disease." In future studies, Dr. Grundstrom Brighenti and colleagues plan to "pursue new strategies developed to enhance cell-mediated immune responses that are known to provide protective immunity in patients with TB. Such an approach may involve targeting of certain subpopulations of immune cells with anti-inflammatory or immunoregulatory properties."

This work was supported by grants from the Swedish Society for Medical Research (SSMF), the Swedish Foundation for Strategic Research (SSF), Sida/SAREC, the Swedish Research Council (VR), the Swedish Heart and Lung Foundation (HLF) and the National Board of Health and Wealth fare.

Journal reference:

1. Rahman et al. **Compartmentalization of Immune Responses in Human Tuberculosis. Few CD8 Effector T Cells but Elevated Levels of FoxP3 Regulatory T Cells in the Granulomatous Lesions**. *American Journal Of Pathology*, 2009; DOI: 10.2353/ajpath.2009.080941

Adapted from materials provided by American Journal of Pathology, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090522081205.htm

'Charm' Offensive Could Pinpoint Ways To Change People's Social Habits

ScienceDaily (May 31, 2009) — People like to believe their actions are driven by their own free will and are not unduly affected by other people. Research, though, shows the way we act is often subconsciously influenced by what we believe to be 'normal' behaviour. Led by Kingston University with Swansea University and University of the West of England (UWE), a new £1.1 million research project is about to take this finding to the next level by investigating whether it is possible to nudge individual behaviour in a socially-desirable direction, simply by telling people what others are doing.

Appropriately dubbed 'Charm', the three-year project is funded by the Engineering and Physical Sciences Research Council and the results could be used to change people habits surrounding such national issues as climate change and obesity. The research will involve 800 people in three case-studies, one relating to electricity consumption, a second to obesity and active lifestyles and the third looking at green activity among online social groups. The studies will use technology such as mobile phones and Facebook to collect and feed back information on what most people do, to see whether this changes individual behaviour.Principal Charm investigator Dr Rettie said social habits were based on assumptions about normal practices such as having a bath every day or washing clothes each week. "It is very difficult to shift people's views on what they see as being normal," Dr Rettie explained. "This is why direct approaches, such as telling them not to keep their house temperature at a constant 22 degrees because it will increase their carbon footprint, fail so often."

Previous projects had shown that telling individuals what neighbours, colleagues, friends – or even people they just perceived as being like them – were doing, affected their own actions, Dr Rettie said. Recent research involved notices in hotel rooms asking guests to help protect the environment by not leaving their towels out for washing every day.

"This approach had only limited impact, but when hotels changed the wording to say '75 per cent of the people who have stayed in this room re-used their towels to help the environment' – there was a marked drop in the number left out for washing," she said. "I think this shows that, ultimately, we all just want to be like other people."The electricity consumption case-study will involve a special sensor gadget attached to participants' electricity supply. As well as telling them about their own electricity usage, the sensors will also tell participants how much power their neighbours are using. "We hope to expand on a similar project that was carried out in the United States," Dr Matthew Studley, a robotics expert from UWE, and one of Charm's co-investigators, said. "The US research revealed that those people who were told they used more electricity than most of their neighbours dropped their consumption, while interestingly, those who were originally using less power than other people in their street, slightly increased their usage."

For the activity lifestyle case-study, a specially-designed application will monitor the daily physical activity of groups of friends, sending feedback to them via their mobile phones. Dr Parisa Eslambolchilar, from Swansea University, leading this part of the research, said: "My area is human-computer interaction and persuasion, so I'll be looking at whether we can use this new technology to convince people to take up a healthier lifestyle."The final case-study will use Facebook to evaluate the effect of feedback on sustainable behaviours among a social network group. "What makes Charm different to previous smaller scale projects is that this study is truly inter-disciplinary, drawing upon research in sociology, social psychology and behavioural economics to really examine people's innate desire to conform to what is normal," Dr Rettie said.

Adapted from materials provided by Kingston University.

http://www.sciencedaily.com/releases/2009/05/090528135408.htm

How Oxidative Stress May Help Prolong Life

Trey Ideker, Ph.D. is a researcher at University of California, San Diego. (Credit: UC San Diego)

ScienceDaily (May 30, 2009) — Oxidative stress has been linked to aging, cancer and other diseases in humans. Paradoxically, researchers have suggested that small exposure to oxidative conditions may actually offer protection from acute doses. Now, scientists at the University of California, San Diego, have discovered the gene responsible for this effect.

Their study, published in *PLoS Genetics* on May 29, explains the underlying mechanism of the process that prevents cellular damage by reactive oxygen species (ROS).

"We may drink pomegranate juice to protect our bodies from so-called 'free radicals' or look at restricting calorie intake to extend our lifespan," said Trey Ideker, PhD, chief of the Division of Genetics in the Department of Medicine at UC San Diego's School of Medicine and professor of bioengineering at the Jacobs School of Engineering. "But our study suggests why humans may actually be able to prolong the aging process by regularly exposing our bodies to minimal amounts of oxidants."

Reactive oxygen species (ROS), ions that form as a natural byproduct of the metabolism of oxygen, play important roles in cell signaling. These very small molecules include oxygen ions, free radicals and peroxides. However, during times of environmental stress (for example, ultraviolet radiation or heat or chemical exposure), ROS levels can increase dramatically. This can result in significant damage to cellular damage to DNA, RNA and proteins – cumulating in an effect called oxidative stress.

One major contributor to oxidative stress is hydrogen peroxide, converted from a type of free radical that leaks from the mitochondria as it produces energy. While the cell has ways to help minimize the damaging effects of hydrogen peroxide by converting it to oxygen and water, this conversion isn't 100 percent successful.

Ideker and first author Ryan Kelley used the rich functional genomics toolbox of yeast to identify pathways involved in the cell's adaption to hydrogen peroxide. Adaption (or hormesis) is an effect where a toxic substance acts like a stimulant in small doses, but is an inhibitor in large doses.

To shed light on the molecular mechanisms of adaptation, Ideker and Kelley designed a way to identify genes involved in adaptation to hydrogen peroxide. They elicited adaptation by pre-treating cells with a mild dose of hydrogen peroxide, followed by a high dose. They observed that the cells undergoing this adaptation protocol exhibited a smaller reduction in viability than cells exposed to only an acute treatment protocol (in which about half of the cells died.)

To figure out which genes might control this adaptation mechanism, Kelley and Ideker ran a series of experiments in which cells were forced to adapt while each gene in the genome was removed, one by one – covering a total of nearly 5,000 genes. By systematically removing genes, they identified a novel factor called Mga2 – and discovered that this transcription factor is essential for adaptation.

"This was a surprise, because Mga2 is found at the control point of a completely different pathway than those which respond to acute exposure of oxidative agents," said Ideker. "This second pathway is only active at lower doses of oxidation."

This finding may explain recent studies suggesting that eating less may, in fact, raise ROS levels – and, in doing so, provide protection from acute doses of oxidants. This is counter to the hypothesis that caloric restriction extends lifespan in some species because it reduces ROS produced as a by-product of the energy regenerated by mitochondria.

"It may be that adaption to oxidative stress is the main factor responsible for the lifespan-expanding effects of caloric restriction," said Ideker. "Our next step is to figure out how Mga2 works to create a separate pathway – to discover the upstream mechanism that senses low doses of oxidation and triggers a protective mechanism downstream." Further efforts to understand this process may have broad implications on models of aging and disease.

This work was supported by a grant from the National Institute of Environmental Health Sciences. Ideker is a David and Lucille Packard Fellow.

Journal reference:

1. Ryan Kelley, Trey Ideker. **Genome-Wide Fitness and Expression Profiling Implicate Mga2 in Adaptation to Hydrogen Peroxide**. *PLoS Genetics*, 2009; 5 (5): e1000488 DOI: 10.1371/journal.pgen.1000488

Adapted from materials provided by University of California - San Diego, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090528203726.htm

Hospitals Save Money with Homeless Outreach

By: David Rosenfeld

Dr. Laura Sadowski knows how homeless people can be treated by hospitals. She's seen the occasional taxicabs from another hospital drop off homeless patients at the door to the nearby teaching hospital where she works.

While never as dramatic as the homeless patient "dumping" by Kaiser Permanente and others in Los Angeles, as an internal medicine physician at Stroger Hospital in Chicago, Sadowski had enough of an idea to know that hospitals in her area could probably do more to help the homeless.

When The Chicago Continuum of Care, a nonprofit advocacy group, asked Sadowski and a group of colleagues to verify the results of a program it started in 2002, the subject was near and dear to her heart.

Their findings, published in the May 6 issue of the *Journal of the American Medical Association*, found that hospitals saved hundreds of thousands of dollars by helping to provide transitional housing and case management services together with local advocacy groups.

The study looked at 600 chronically ill homeless people who attended Stroger and one other Chicago hospital, with 200 of them receiving case management and housing. The group included people living on the street from 30 days to 30 years, in many ways mirroring the 3.5 million Americans (and growing) who face homelessness at some point during the year.

Researchers also selected those with chronic health conditions other than mental health or substance abuse, although participants with these and other conditions were not excluded.

"We wanted, in part, to show whether or not this model works, but we also wanted the literature to broaden and not portray the homeless as severely mentally ill or alcohol dependent or drug abusers because that's just a small portion of the homeless," Sadowski said.

After 18 months, the group of 200 patients with housing — the intervention group — each made at least one trip to the hospital, but overall they reduced their hospitalizations on average by 2.7 days per person per year, which translates into hundreds of thousands of dollars, far more than the costs of providing the services.

"After adjusting for various factors, compared with the usual care group, the intervention group had a relative reduction of 29 percent in hospitalizations, 29 percent in hospital days and 24 percent in emergency department visits," the authors wrote.

"I'm hoping hospitals find our findings provocative," Sadowski told Miller-McCune.com. "Hospitals change procedures just to save a single hospital day a year, our study shows you can save 2.7 hospital days a year, which is a lot of money for hospitals to take care of the homeless."

The Chicago study comes on the heels of another study validating a far more radical homeless housing program in Seattle, part of a larger movement that *Miller-McCune* has hailed as the possible answer to ending homelessness. That Seattle study looked at a program by Seattle's Downtown Emergency Service Center, which provides housing to alcoholics and allows them to continue drinking.

The average cost per person to publicly funded health and criminal justice systems before intervention was $4,066 per year. After six months with housing, the cost fell to $1492, and after 12 months to $958. Professor Mary Larimer at the University of Washington and colleagues published their findings in the March issue of *JAMA*.

"We're trying to inform the public debate on issues related alcohol, tobacco and drugs," said Prabhu Ponkshe, communications director for the Substance Abuse Policy Research Program, which funded the Seattle study through a Robert Wood Johnson grant. "What should we do in terms of evidence-based policies related to these people is of deep interest."

http://www.miller-mccune.com/news/hospitals-save-money-with-homeless-outreach-1237

'Generation Green' Environmentally Oblivious

By: Tom Jacobs

Young people, in the popular imagination, are more environmentally conscious than the rest of us. But a new analysis of 30 years worth of data suggests that if we're waiting for a child to lead us out of the wilderness of environmental degradation, we may be waiting a long time.

Except for a brief blip in the early 1990s, high school seniors expressed decreasing levels of concern about environmental issues between 1976 and 2005, and were less willing to engage in earth-friendly behaviors such as conserving energy. That's the conclusion of a study of trends in adolescent attitudes just published in the journal *Environment and Behavior*.

A research team led by Laura Wray-Lake of The Pennsylvania State University's Department of Human Development and Family Studies examined data from the "Monitoring the Future" study, a sophisticated survey of the beliefs and behaviors of American secondary school students. The scholars mapped trends in a variety of environment-related areas, including conservation-conscious behaviors, feelings of responsibility for the environment and faith in technology.

"We found a precipitous decline in high school seniors' reports of conservation behaviors across the three decades," they report. "These trends clearly indicate that youth in the past two decades were not as willing to endorse conservation behaviors of cutting down on heat, electricity, driving and using bikes or mass transit as were young people in the 1970s."

In a "strikingly similar" pattern, the prediction that Americans will face resource shortages was widely accepted by high school seniors in the late 1970s, but the percentage of adolescents agreeing with that statement dropped steeply during the 1980s and again in the early 1990s.

"Clearly, the average high school student across the past three decades has not viewed himself or herself as the first line of defense in protecting the environment," the scholars conclude. They add that the high

school seniors surveyed "tended to see government, and people in general, as more responsible for environmental problems than they themselves felt."

So much for generation green.

The researchers note that the short-lived shift in behavior and attitudes in the early 1990s followed the heavily publicized 20th anniversary of Earth Day in 1990. Although the data is not yet available, it is conceivable that Al Gore's widely viewed 2006 documentary *An Inconvenient Truth* may have sparked a similar upswing in environmental consciousness among young people.

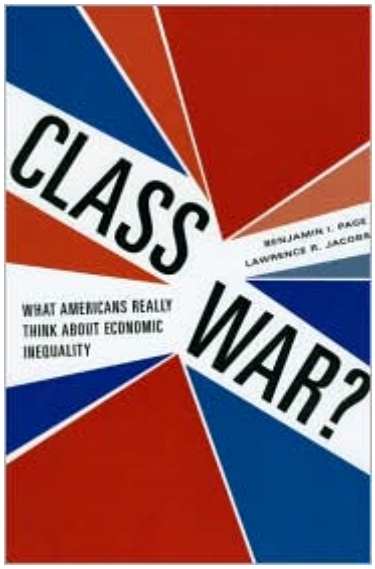
Even if the film is having that effect, the survey suggests the results will be short-lived without a sustained campaign to increase environmental awareness. If climate change scientists are correct, today's high school seniors will almost certainly suffer the effects of global warming, but there is no evidence to date that this message has gotten through to them or that they have responded by taking action.

http://www.miller-mccune.com/news/generation-green-environmentally-oblivious-1238

What If There Was a Class War and Nobody Showed Up?

By: Matt Palmquist

In the midst of a profound financial challenge for the United States, with debates raging over the role that taxes and governmental regulation should play in rehabilitating the economy, a new book by a pair of political scientists asks a timely question: So where's the class war?



While our talking heads and pundits are only too eager to divide Americans into two diametrically opposed camps — either obdurate advocates of unrestrained free markets or unwavering proponents of governmental solutions to economic travails — the evidence, according to this book, is quite the contrary. Indeed, *Class War? What Americans Really Think About Economic Inequality*, uses 70 years of opinion studies and surveys to make the effective argument that Americans agree broadly, rather than disagree sharply, on most fundamental economic questions. There's no class war, the authors assert, because Americans just don't disagree enough to fight.

Although written by a pair of academics with rather lengthy titles — Benjamin I. Page is the Gordon Scott Fulcher Professor of Decision Making in the Department of Political Science at Northwestern University, and Lawrence R. Jacobs is the Walter F. and Joan Mondale Chair, and director of the Center for the Study of Politics and Governance at the Hubert Humphrey Institute at the University of Minnesota — *Class War?* is aimed at a general audience.

This is not a book packed with carefully constructed footnotes and citations intended to settle nuanced scholarly debates. Rather, it is written in a familiar, conversational style with chapters split into short snippets that keep the ideas moving quickly; indeed the authors write that they have "forsaken some of the conventions of academia, in the hope of communicating with general readers who might be put off by scholarly jargon or extensive discussions of academic research."

To that end, *Class War?* succeeds in throwing off the shackles of academic discourse and speaking directly to readers, but its effectiveness nevertheless rests on meticulous analysis of survey data and opinion polling on economic equality. Page and Jacobs even introduce their own study, the "Inequality Survey," in which they asked questions drawn from previous surveys from as far back as the 1930s, allowing them to contextualize their findings in terms of past public attitudes. Using this method, the authors "confirm, update, or (in some cases) refute virtually all the main conclusions of previous researchers."

Their main finding is two-pronged and may seem, at first, to be paradoxical, but as Page and Jacobs write, "Americans are both philosophically conservative and operationally liberal." They term this approach to economic thinking "conservative egalitarianism," a belief system that admires individual self-reliance but accepts public intervention as necessary to help citizens strive for the American Dream on an ostensibly level playing field.

"The idea of government-guaranteed food, clothing, and shelter has been favored by large majorities of Americans since at least 1964, and is embraced across lines of class, race, and party," the authors write. "... An important reason for the lack of class war is widespread agreement across social and economic classes in favor of targeted government programs that foster the American Dream and provide a measure of economic security."

But, of course, examples of economic inequality abound in the United States, and some of the strongest sections of Class War? use real-world examples — from San Jose, Calif., to Richmond, Va. — to drive home the authors' point that "down on the street, differences in income and what it means can become obvious.

"Inequality is not an abstract notion raised by outside troublemakers. Americans see inequality because they live it." According to a Pew Research study in 2007, 63 percent of Americans say the country is "losing ground" on the gap between the rich and the poor. But recognizing a problem and taking to the streets are two wildly different ideas to most Americans, and as the authors write: "The majorities who favor reducing inequality are not scary mobs of landless seventeenth-century peasants with pitchforks."

Indeed, talking honestly about income inequality without fear of setting off inter-class warfare is a necessary first step for policy-makers, the authors insist. And rather than pretending the problem doesn't exist out of an irrational fear of cataclysmic citizen-on-citizen violence, Page and Jacobs argue that the public needs more information about - and involvement in - the income inequality issue; "or, to put it more simply," they write, "getting ordinary Americans involved, getting them organized, and making a ruckus."

Income inequality, they stress, is not a Republican or Democratic issue, but an American problem. Time and again, public opinion polls and surveys have shown that across economic, geographical and ideological lines, most Americans support a higher minimum wage, improved public schools, better access to universal health care -and the use of taxes to fund these types of programs. At the same time, the average American remains deeply skeptical about the government's capacity to address these problems, and believes in the individual's ability to chart his or her own course toward the American Dream.

But rather than a battlefield, Page and Jacobs assert these ideas represent some common ground. It's up to politicians, pundits and policy-makers to see this "conservative egalitarianism" for the opportunity it represents; if not, the authors warn, the income inequality gap will only grow larger.

http://www.miller-mccune.com/business_economics/class-war-nobody-showed-up-1245

Battling AIDS In Its Worst-Hit Demographic

By: Ryan Blitstein

The U.S. AIDS epidemic disproportionately affects African Americans — of the 1 million-plus HIV positive Americans, nearly half are black. And every year, about 25,000 African Americans become infected. The crisis is the focus of most of the articles in the June edition of the *American Journal of Public Health*.

Miller-McCune.com spoke with one of the issue's guest co-editors, Donna Hubbard McCree of the HIV/AIDS prevention division at the Centers for Disease Control and Prevention, about the nature of the problem and some research aimed at addressing it.

Miller-McCune.com: Health disparities between racial groups exist across a range of diseases. Why is tackling HIV/AIDS different?

Donna Hubbard McCree: There are common causes for other disparities, such as the lack of access to care and poverty. But HIV is different because we're talking about a sexually transmitted disease. It's different because of how HIV is transmitted and acquired. Culture has a role in how people look at themselves as being at risk, and how they seek care in terms of disclosure. If you read the literature, particularly about some of the factors affecting HIV in African Americans, you see issues around stigma, things like homophobia and racism. With most other health disparities, stigma is not an issue.

The advances in treatment have also made it more of a chronic disease. We have to deal with treatment in terms of not just the individual who might be affected but also mothers or those of childbearing age.

M-M: In an editorial in this issue, you mentioned the CDC's first-of-its-kind collaborative research consultation on the topic in late 2007. As a leader of the event, what did you learn, and how is CDC applying it to research?

DHM: It was unique in that it was the first time we really brought researchers in. The consultations we've had in the past have brought in members of the African-American community, which is important. This time we were looking at a need to bring everybody to the table.

At the consultation, we found that it made sense to look more at the structural and contextual causes of HIV among African Americans and a focus on prevention research around those initiatives, maybe to look at a shift in the paradigm. That's something we're already doing — it's a shift from looking at individuals to looking more at groups and communities, where you can have broader effects.

M-M: Within the black community, HIV rates are extremely high among African-American men who have sex with men (MSM), but don't identify as gay or bisexual. What are the most promising prevention strategies among that group?

DHM: If you look at the data, African-American men who have sex with men make up the largest proportion of the U.S. population affected by HIV. But black women are second. Given those statistics, we have to look at the African-American community as a whole. You have to look more at the contextual factors, those that affect not just HIV but other diseases and disparities.

M-M: Is CDC funding parallel interventions targeted specifically toward that group?

DHM: We're doing that, too. D-up/Defend Yourself is one project. It's a community-level intervention based on previous work with other groups and adapted for black men who have sex with men.

We go into a community, find people who are popular or opinion leaders and train those individuals around HIV prevention behavior. Then we send them out to become agents of change within their communities. These men are recruited from settings where you can target men for an intervention study, like nightclubs. Those individuals who were trained went out and educated others. The whole premise is about what you can do to not only defend yourself but to defend your community. The activities are developed around skills-building and prevention.

We've also funded projects that looked at the use of different methodologies to identify men who have sex with men and women. We used respondent-driven sampling, a technique for finding hidden populations, as a strategy to locate them. We used the results of that method to design funding opportunities to develop interventions for bisexually active men who have sex with men and women. We funded three sites to conduct studies, and we're just beginning to design the studies.

We have a huge six-site study we call the Latino/African-American MSM project. The project researchers have already had preliminary evidence of interventions with effectiveness, and we're now funding rigorous evaluations of them.

M-M: One *AJPH* study led by Lisa W. Kimbrough uses a social network strategy that seems similar to D-up.

DHM: With D-up, it's about recruiting people in social networks to promote healthy sexual behavior. Kimbrough is talking about a mechanism for bringing individuals within a social network in for HIV testing. In traditional counseling, if someone tests positive, they'd bring in their sex or needle-sharing partner, as those people would be at risk. With a social network approach, you're not just asking people to bring in their partners, but also to bring in their friends. The point is to get within the network of people, assuming that whole network may be at high risk. We're funding evaluations of the traditional HIV counseling approach against the social networking approach to see which one is most effective.

M-M: Another paper proposes that interventions among African-American men and women should be very different. Is that a worthwhile strategy?

DHM: Yes, and I think they really did a great job of laying out the reasons why. There are so many differences based on the gender and sexual roles. For example, looking at the protection mechanism of the use of the male condom, which women have to negotiate. And there are different reasons, based on the gender of the individual, why it might be difficult to engage in those acts, so I definitely believe interventions need to be specific. There's also the gender dynamics of intimate partner violence, and economic reasons, different reasons why women and men may be having sex. This requires us to develop interventions differently.

M-M: Is there more government money than before to conduct interventions like that?

DHM: We're in a time of flat federal funding, and the majority of the money is going into treatment. As a nation, we're interested more in treatment than prevention. About 4 percent of the national HIV budget goes to prevention (with CDC providing about $750 million of that figure). That's a small amount, but we use those dollars to affect those who are most affected by the epidemic.

http://www.miller-mccune.com/health/aids-african-american-1235

The Deadly Toll of Abortion by Amateurs

By DENISE GRADY

BEREGA, Tanzania — A handwritten ledger at the hospital tells a grim story. For the month of January, 17 of the 31 minor surgical procedures here were done to repair the results of "incomplete abortions." A few may have been miscarriages, but most were botched operations by untrained, clumsy hands.

Abortion is illegal in Tanzania (except to save the mother's life or health), so women and girls turn to amateurs, who may dose them with herbs or other concoctions, pummel their bellies or insert objects vaginally. Infections, bleeding and punctures of the uterus or bowel can result, and can be fatal. Doctors treating women after these bungled attempts sometimes have no choice but to remove the uterus.

Pregnancy and childbirth are among the greatest dangers that women face in Africa, which has the world's highest rates of maternal mortality — at least 100 times those in developed countries. Abortion accounts for a significant part of the death toll.

Maternal mortality is high in Tanzania: for every 100,000 births, 950 women die. In the United States, the figure is 11, and it is even lower in other developed countries. But Tanzania's record is neither the best nor the worst in Africa. Many other countries have similar statistics; quite a few do better and a handful do markedly worse.

Eighty percent of Tanzanians live in rural areas, and the hospital in Berega — miles from paved roads and electric poles — is a typical rural hospital, struggling to deal with the same problems faced by hospitals and clinics in much of the country. Abortion is a constant worry.

Worldwide, there are 19 million unsafe abortions a year, and they kill 70,000 women (accounting for 13 percent of maternal deaths), mostly in poor countries like Tanzania where abortion is illegal, according to the World Health Organization. More than two million women a year suffer serious complications. According to Unicef, unsafe abortions cause 4 percent of deaths among pregnant women in Africa, 6 percent in Asia and 12 percent in Latin America and the Caribbean.

Reliable figures on abortion in Tanzania are hard to come by, but the World Health Organization reports that its region, Eastern Africa, has the world's second-highest rate of unsafe abortions (only South America is higher). And Africa as a whole has the highest proportion of teenagers — 25 percent — among women having unsafe abortions.

The 120-bed hospital in Berega depends on solar panels and a generator, which is run for only a few hours a day. Short on staff members, supplies and even water, the hospital puts a lot of its scarce resources into cleaning up after failed abortions.

The medical director, Dr. Paschal Mdoe, 30, said many patients who had had the unsafe abortions were 16 to 20 years old, and four months pregnant. He said there was a steady stream of cases, much as he had seen in hospitals in other parts of the country.

"It's the same everywhere," he said.

On a Friday in January, 6 of 20 patients in the women's ward were recovering from attempted abortions. One, a 25-year-old schoolteacher, lay in bed moaning and writhing. She had been treated at the hospital a week earlier for an incomplete abortion and now was back, bleeding and in severe pain. She was taken to the operating room once again and anesthetized, and Emmanuel Makanza, who had treated her the first time, discovered that he had failed to remove all the membranes formed during the pregnancy. Once again, he scraped the inside of her womb with a curet, a metal instrument. It was a vigorous, bloody procedure. This time, he said, it was complete.

Mr. Makanza is an assistant medical officer, not a fully trained physician. Assistant medical officers have education similar to that of physician assistants in the United States, but with additional training in surgery. They are Tanzania's solution to a severe shortage of doctors, and they perform many basic operations, like Caesareans and appendectomies. The hospital in Berega has two.

Abortions in Berega come in seasonal waves — March and April, August and September — in sync with planting and harvests, when a lot of socializing goes on, Dr. Mdoe said. He said rumor had it that many abortions were done by a man in Gairo, a town west of Berega. In some cases, he said, the abortionist only started the procedure, knowing that doctors would have to finish the job.

Dr. Mdoe said he suspected that some of the other illegal abortionists were hospital workers with delusions of surgical skill.

"They just poke, poke, poke," he said. "And then the woman has to come here." Sometimes the doctors find fragments of sticks left inside the uterus, an invitation to sepsis.

In the past some hospitals threatened to withhold care until a woman identified the abortionist (performing abortions can bring a 14-year prison term), but that practice was abandoned in favor of simply providing postabortal treatment. Still, women do not want to discuss what happened or even admit that they had anything other than a miscarriage, because in theory they can be prosecuted for having abortions. The law calls for seven years in prison for the woman. So doctors generally do not ask questions.

"They are supposed to be arrested," Dr. Mdoe said. "Our work as physicians is just to help and make sure they get healed."

He went on, "We as medical personnel think abortion should be legal so a qualified person can do it and you can have safe abortion." There are no plans in Tanzania to change the law.

The steady stream of cases reflects widespread ignorance about contraception. Young people in the region do not seem to know much or care much about birth control or safe sex, Dr. Mdoe said.

In most countries the rates of abortion, whether legal or illegal — and abortion-related deaths — tend to decrease when the use of birth control increases. But only about a quarter of Tanzanians use contraception. In South Africa, the rate of contraception use is 60 percent, and in Kenya 39 percent. Both have lower rates of maternal mortality than does Tanzania. South Africa also allows abortion on request.

But in other African nations like Sierra Leone and Nigeria, abortion is not available on request, and the figures on contraceptive use are even lower than Tanzania's and maternal mortality is higher. Nonprofit groups are working with the Tanzanian government to provide family planning, but the country is vast, and the widely distributed rural populations makes many people extremely hard to reach.

Geography is not the only obstacle. An assistant medical officer, Telesphory Kaneno, said: "Talking about sexuality and the sex organs is still a taboo in our community. For a woman, if it is known that she is taking contraceptives, there is a fear of being called promiscuous."

In interviews, some young women from the area who had given birth as teenagers said they had not used birth control because they did not know about it or thought it was unsafe: they had heard that condoms were unsanitary and that birth control pills and other hormonal contraceptives could cause cancer.

Mr. Kaneno said the doctors were trying to dispel those taboos and convince women that it was a good thing to be able to choose whether and when to get pregnant.

"It is still a long way to go," he said.

http://www.nytimes.com/2009/06/02/health/02abort.html?_r=1&nl=health&emc=a1

Better Running Through Walking

By TARA PARKER-POPE

I am more couch potato than runner. But not long ago, I decided to get myself into shape to run in the New York City Marathon, on Nov. 1, just 152 days from now. (Not that I'm counting.)

To train for my first marathon, I'm using the "run-walk" method, popularized by the distance coach Jeff Galloway, a member of the 1972 Olympic team. When I mentioned this to a colleague who runs, she snickered — a common reaction among purists.

But after interviewing several people who have used the method, I'm convinced that those of us run-walking the marathon will have the last laugh.

Contrary to what you might think, the technique doesn't mean walking when you're tired; it means taking brief walk breaks when you're not.

Depending on one's fitness level, a walk-break runner might run for a minute and walk for a minute, whether on a 5-mile training run or the 26.2-mile course on race day. A more experienced runner might incorporate a one-minute walk break for every mile of running.

Taking these breaks makes marathon training less grueling and reduces the risk of injury, Mr. Galloway says, because it gives the muscles regular recovery time during a long run. Walk breaks are a way for older, less fit and overweight people to take part in a sport that would otherwise be off limits. But most surprising are the stories from veteran runners who say run-walk training has helped them post faster race times than ever.

One of them is Tim Deegan of Jacksonville, Fla., who had run 25 marathons when his wife, Donna Deegan, a popular local newscaster and cancer survivor, began organizing a marathon to raise money for breast cancer research. When Mr. Galloway volunteered to help with the race, Ms. Deegan asked her husband to take part in run-walk training to show support.

"The only reason I did this is because I love my wife," said Mr. Deegan, 49. "To say I was a skeptic is to put it very nicely."

But to his surprise, he began to enjoy running more, and he found that his body recovered more quickly from long runs. His times had been slowing — to about 3 hours 45 minutes, 15 minutes shy of qualifying for the Boston Marathon — but as he ran-walked his way through the Jacksonville Marathon, "I started thinking I might have a chance to qualify for Boston again."

He did, posting a time of 3:28.

Nadine Rihani of Nashville ran her first marathon at age 61, taking walk breaks. Her running friends urged her to adopt more traditional training, and she was eventually sidelined by back and hip pain. So she resumed run-walk training, and in April, at age 70, she finished first in her age group in the Country Music Marathon, coming in at 6:05.

"My friends who were 'serious' runners said, 'You don't need to do those walk breaks,' " she said. "I found out the hard way I really did."

Dave Desposato, a 46-year-old financial analyst, began run-walk training several years ago after excessive running resulted in an overuse injury. He finished this year's Bayshore Marathon in Traverse City, Mich., in 3:31:42, cutting 12 minutes off his previous best.

"I run enough marathons now to see everybody totally collapsing at the end is very, very common," he said. "You wish you could share your experience with them, but they have to be willing to listen first."

Another unconventional element of walk-break training is the frequency — typically just three days a week, with two easy runs of 20 to 60 minutes each and a long run on the weekend. The walk breaks allow runners to build up their mileage without subjecting their bodies to the stress of daily running, Mr. Galloway said.

Many runners take their own version of walk breaks without thinking about it, he says: they slow down at water stations or reduce their pace when they tire. Scheduling walk breaks earlier in a run gives the athlete control over the race and a chance to finish stronger.

While I'm planning to use run-walk training to complete my first marathon, I've heard from many runners who adhere to a variety of training methods. So later this week, the Well blog will have a new feature: the Run Well marathon training tool, with which you can choose any of several coaches' training plans and then track your progress.

Besides Mr. Galloway, plans are being offered by the marathoner Greg McMillan, who is renowned for his detailed training plans that help runners reach their time goals; the New York Flyers, the city's largest running club, which incorporates local road races into its training; and Team for Kids, a New York Road Runners Foundation charity program that trains 5,000 adult runners around the world.

The Run Well series also gives you access to top running experts, advice from elite runners, reviews of running gadgets and regular doses of inspiration to get you race-ready.

So please join me, the coaches and other running enthusiasts every day at the Well blog, nytimes.com/well, during the next five months of training. For me, this is finally the year I'll run a marathon. I hope it will be your year too.

http://www.nytimes.com/2009/06/02/health/02well.html?nl=health&emc=a1

Online, 'a Reason to Keep on Going'

By STEPHANIE CLIFFORD

Like many older people, Paula Rice of Island City, Ky., has grown isolated in recent years. Her four grown children live in other states, her two marriages ended in divorce, and her friends are scattered. Most days, she does not see another person.

But Ms. Rice, 73, is far from lonely. Housebound after suffering a heart attack two years ago, she began visiting the social networking sites Eons.com, an online community for aging baby boomers, and PoliceLink.com (she is a former police dispatcher). Now she spends up to 14 hours a day in online conversations.

"I was dying of boredom," she said. "Eons, all by its lonesome, gave me a reason to keep on going."

That more and more people in Ms. Rice's generation are joining networks like Eons, Facebook and MySpace is hardly news. Among older people who went online last year, the number visiting social networks grew almost twice as fast as the overall rate of Internet use among that group, according to the media measurement company comScore. But now researchers who focus on aging are studying the phenomenon to see whether the networks can provide some of the benefits of a group of friends, while being much easier to assemble and maintain.

"One of the greatest challenges or losses that we face as older adults, frankly, is not about our health, but it's actually about our social network deteriorating on us, because our friends get sick, our spouse passes away, friends pass away, or we move," said Joseph F. Coughlin, director of the AgeLab at the Massachusetts Institute of Technology.

"The new future of old age is about staying in society, staying in the workplace and staying very connected," he added. "And technology is going to be a very big part of that, because the new reality is, increasingly, a virtual reality. It provides a way to make new connections, new friends and new senses of purpose."

About one-third of people 75 and older live alone, according to a 2009 study from AARP. In response to the growing number of older Americans, the National Institute on Aging is awarding at least $10 million in grants for researchers who examine social neuroscience and its effect on aging.

Online networks may offer older people "a place where they do feel empowered, because they can make these connections and they can talk to people without having to ask a friend or a family member for one more thing," said Antonina Bambina, a sociologist at the University of Southern Indiana who wrote the book "Online Social Support" (Cambria, 2007).

For the family members of older people, online social networks can provide a bit of relief. Chris McWade of Franklin, Mass., the youngest member of a big family, recently helped his parents, his grandparents and his uncle move to retirement homes. He said he spent two or three years "just flying cross-country, holding a lot of hands" and seeing the isolation and depression that came with aging.

That sparked the idea for MyWay Village, a social network based in Quincy, Mass. Mr. McWade helped found it in 2006 and now sells it to retirement homes. It has just completed pilot programs in several nursing homes in Illinois and Massachusetts, and Mr. McWade says he has agreements to expand to several other homes.

Two and a half years ago, Howe Allen, a real estate broker in Boston, moved his parents to the River Bay Club, a retirement home in Quincy, Mass., that uses MyWay. His mother died soon after, but his father, Carl, was able to start making friends and share stories on MyWay. The older man had never used a computer, but picked it up quickly; the software includes computer training sessions. And after he died last December, a memorial service at the home included photographs he had uploaded to MyWay, excerpts from memoirs he had posted and eulogies from friends he had made through the site.

"It was as moving a day as I can ever remember," Howe Allen said. "It's more than just the computer. It affected him in ways that are so far from the electronic age. It allowed this person to grow at an age where you assume most people stop growing."

On a recent Monday, Neil Sullivan, a regional manager for MyWay, stood in front of a group of about 20 River Bay Club residents in the home's library.He came prepared with slides and speeches, but mostly the group just wanted to talk about their lives. When Mr. Sullivan showed a photograph of a 1950 Chevrolet, one resident said, "I had a '57 Chevy," and another responded, "Mine was a '49 Chevy." A man in a chartreuse sweater who had been quiet for some time added, "The best car I ever had was a Dodge Business Coupe."

Sarah Hoit, a co-founder of MyWay and its chief executive, said that for older people, learning to get online was not an end in itself. "They want a vehicle to meet new people and share their lives," she said. "They want to be stimulated."Outside of the weekly sessions, River Bay residents use the site to post stories like "My Life as a Nurse" or "I Worked at the Howard Johnson in Quincy." Sunny Walker, 89, who refused to use an electric typewriter when she was a school secretary because she hated technology so much, now plays games and sends friends messages through the site.

"I'm telling you, it's the best thing for seniors," she said. "It challenges their mind, that's what it does. It challenged mine."

Some research suggests that loneliness can hasten dementia, and Dr. Nicholas A. Christakis, an internist and social scientist at Harvard, says he is considering research on whether online social connections can help delay dementia, as traditional ones have been found to do in some studies.

"Online social networks realize an ancient propensity we all have to connect with others," he said.

The propensity may be ancient, but the means are not. Mollie Bourne, a golf course owner who lives in Puerto Vallarta, Mexico, half of the year, logs on to Facebook a few times a week. She likes to browse through her grandchildren's posts and photos, even the ones taken at bars and parties that are hardly the sort that people expect their grandmothers to see.

"For heaven's sakes, we all acted like that in college," she said. "That's one thing you get with your 76 years. I've been around. I've seen it all. It takes a lot to shock me."

http://www.nytimes.com/2009/06/02/health/02face.html?nl=health&emc=a3

Alcohol reduces gallstone risk

Drinking in moderation has some health benefits

Drinking a moderate amount of alcohol protects against the development of gallstones, UK researchers say.

Consuming two units a day cuts the chance of developing gallstones by a third, analysis of data from 25,000 men and women showed.

Gallstones are very common but symptoms and complications are only seen in three in 10 cases.

Delegates at a US conference heard that alcohol reduces cholesterol in the bile from which gallstones form.

The researchers used data from a large study set up to look at the link between diet and cancer in men and women in the 45-74 age range.

COMPLICATIONS OF GALLSTONES

Severe pain

Inflammation and infection

Jaundice

Alcohol intake was compared with the risk of developing symptomatic gallstones over a 10-year period.

Those who did develop the condition were an average of 62 years old and more than two-thirds were women.

They calculated that those in the highest alcohol group had a 32% lower risk than those who drank no or little alcohol.

For every unit of alcohol extra drunk per week, the risk of gallstones fell by 3%.

The researchers said it had been suggested that alcohol might reduce gallstones through its effects on cholesterol but the magnitude of the effect had not been calculated.

Cholesterol

Gallstones form in the gallbladder from bile and are generally made up of hardened cholesterol.

It is thought that around one in three women and one in six men get gallstones at some point in their life but they are more common in older adults.

Other factors which increase the chances of them forming include pregnancy, obesity, rapid weight loss and some medications.

“Moderate alcohol below recommended limits is associated with good health”

Professor Chris Hawkey, British Society of Gastroenterology

Study leader Dr Paul Banim, a clinical lecturer at the University of East Anglia and a specialist registrar in gastroenterology, said alcohol was known to increase levels of "good" HDL cholesterol which was also known to be protective against cardiovascular disease and which could alter the composition of cholesterol in the bile.
He said excessive alcohol intake can cause health problems but quantifying how much alcohol reduces the risk of gallstone development allows doctors to offer specific guidance.
His colleague Dr Andrew Hart, a senior lecturer in gastroenterology, said the findings boosted their understanding of how gallstones formed.

KNOW YOUR LIMITS

Women are advised to drink no more than 2-3 units a day
Men are advised to drink no more than 3-4 units a day
A unit = half a pint of beer, a small (125ml) glass of wine, a shot or a small (25ml) measure of spirits
"Once we examine all the factors related to their development in our study in the UK, including diet, exercise, body weight and alcohol intake, we can develop a precise understanding of what causes gallstones and how to prevent them."
Professor Chris Hawkey, president of the British Society of Gastroenterology, said the study was interesting but should be interpreted with caution because it only measured an association.
"Nevertheless, previous research has found similar findings and it seems likely to be a real effect.
"The University of East Anglia are producing interesting data on consumption of particular foods and alcohol - for example a recent study from that unit suggests that oily fish may protect against ulcerative colitis.
"Moderate alcohol below recommended limits is associated with good health. But alcohol is addictive and drinkers must be careful not to escalate their intake."

The findings were presented at the Digestive Disease Week annual meeting in Chicago.

http://news.bbc.co.uk/2/hi/health/8073844.stm

Testicular cancer genetic advance

Testicular cancer tends to affect younger men

Researchers have for the first time found inherited genetic factors which raise the risk of testicular cancer.

A UK team found many testicular cancer patients shared common DNA variants on chromosomes five, six and 12 that healthy men did not have.

This finding was echoed in a separate US study in the same journal, Nature Genetics, which highlighted two of the same variations.

Both studies raise hopes of better treatments and diagnostic tests.

The UK team, from the Institute of Cancer Research, compared the profile of 730 testicular cancer patients with those of healthy men.

TESTICULAR CANCER

Mainly affects young men aged 20-44

Around 1,900 new cases a year in the UK

Treatment cures over 95% of patients

Untreated, cancer cells may spread to nearby lymph nodes. The disease can also spread to the lungs or, rarely, other organs

They found men who inherit any of the three genetic variants have a raised risk of the disease.

Those who carry the variant most closely linked to the disease have two to three times the risk of the general population.

And inheriting all three variants raises the risk by up to fourfold.

However, it is still the case that only a small proportion of men who carry the higher risk variations will actually develop testicular cancer.

Researcher Dr Elizabeth Rapley said: "We have known for some time that men whose father, brothers or sons had testicular cancer are much more likely to get it themselves and we have been searching for this genetic link.

'More to be found'

"We have identified three genetic factors linked to an increased risk of testicular cancer. We believe there are more still to be found and we are working on identifying the rest."

Professor Mike Stratton, from the Wellcome Trust Sanger Institute, also worked on the study.

He said: "By combining these genetic risks with other known risk factors it may be possible in future to identify men who are at high risk of developing testicular cancer, particularly those who have a brother or father already affected by the disease.
"This may allow early detection or prevention.
All three genetic variants uncovered by the study were found near genes involved in the survival and development of cells which go on to form sperm.
The finding suggests that disrupting the work of these genes may be one mechanism by which cancer is able to grow.

More tests due

One of the variants was found in a gene called KITLG, which is also known to play a role in skin pigmentation.
The higher risk variant was found much more commonly in white men, and may explain why they seem to have a higher risk of testicular cancer.
Ed Yong, of the charity Cancer Research UK, said: "While more than 95% of testicular cancer patients are successfully treated, finding genes that increase the risk of this cancer is important.
"It tells us more about its basic biology and presents new opportunities to prevent, diagnose and treat the disease in those men most at risk - men aged under 50."
Previously, a small US study found a specific gene was more active in some types of testicular cancer cells, but did not establish whether it was inherited, or triggered only in cancer cells after the disease started to develop.
In the latest study, the researchers established the key genetic variations were found in every cell of the patients' bodies - clear evidence that they were definitely inherited.
The researchers are now looking for up to 3,000 men who have had testicular cancer to participate in the study to identify more genetic risk factors.

http://news.bbc.co.uk/2/hi/health/8070094.stm

Drug hope for advanced melanoma

Melanoma can start in a mole or in normal skin

Scientists say they have developed a drug that can treat the most deadly form of skin cancer in its most advanced, incurable stages.

Malignant melanoma is the most rapidly increasing cancer in the UK, largely due to sun exposure.

An experimental drug PLX4032 (R7204) could help many patients with incurable disease live longer with the disease in check, early trial results suggest.

Roche and Plexxikon presented the work at a renowned US cancer meeting.

Experts welcomed the findings and urged people to take care when out in the sun this summer, which is tipped to be hot.

“Melanoma is difficult to treat when it is at an advanced stage”

Dr Jodie Moffat of Cancer Research UK

PLX4032 works by seeking out and destroying tumour cells carrying the BRAF mutation implicated in 60% malignant melanomas.

This could not only help to shrink the skin cancer, but also delay its spread.

Currently, only a small proportion of people - less than 5% - live more than two years if their cancer has spread around the body.

Early findings

In a phase I study involving 16 patients with BRAF-positive melanoma, over half saw the extent of their cancer reduce by at least 30%.

Patients treated with PLX4032 lived for a median of six months without their disease getting worse and more than half experienced significant shrinkage of their tumours.

This included patients where the cancer had spread to the liver, lung and bone.

Roche and its partner Plexxikon told delegates at the American Society of Clinical Oncology meeting in Florida that they now plan larger trials to further test the drug's safety and check things like what dose is best.

They also hope to make a diagnostic test to easily spot which patients have BRAF-positive melanoma.

In the UK, more than 10,400 people are diagnosed with malignant melanoma each year.

MELANOMA

The most serious form of skin cancer

Sun exposure is the main - and most preventable - risk factor, causing genetic damage to the skin

Around one third of melanomas develop from normal moles

The rest develop on areas of previously normal skin

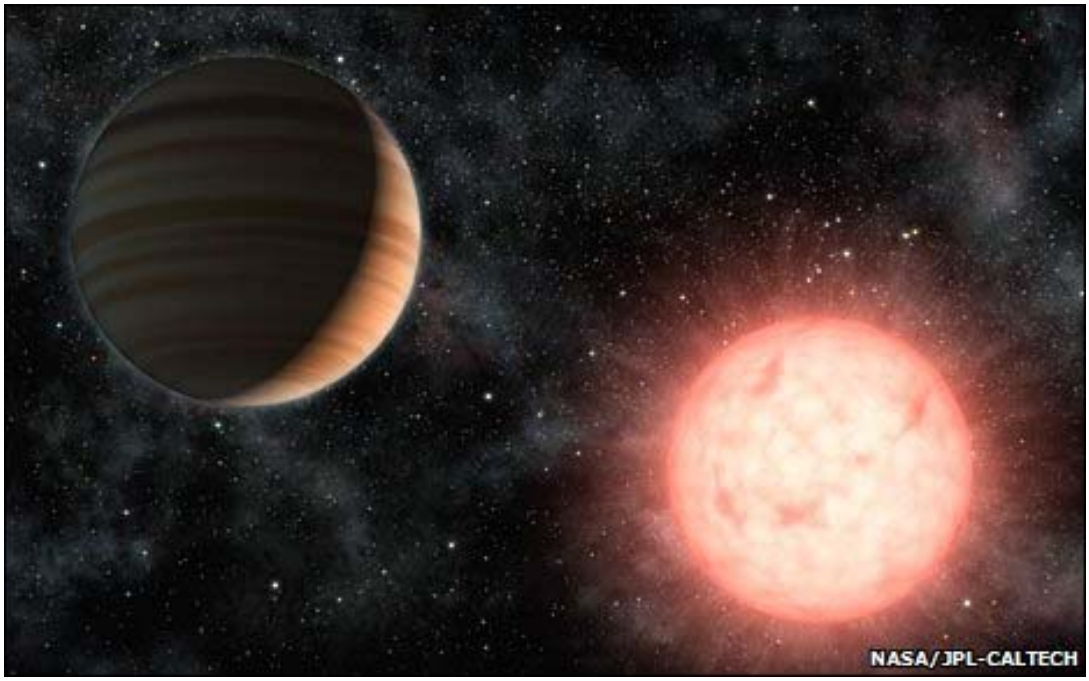
Warning signs include:

Two halves of a mole do not look the same

The edges of the mole are irregular, blurred or jagged
Colour is uneven, with more than one shade
Mole is wider than 6mm
Treatments for advanced melanoma, such as chemotherapy, can lead to an improvement in symptoms and quality of life but do not greatly extend life.
And some people will get the side-effects without many of the benefits.
For these reasons scientists are looking for new therapies.
Others are researching vaccines to treat advanced melanoma by encouraging the body's own immune system to destroy the cancer cells.
Dr Jodie Moffat of Cancer Research UK said: "While these results are interesting, they need to be followed up in much larger studies before we know if this is a suitable new treatment for people with advanced melanoma.
"Melanoma is difficult to treat when it is at an advanced stage so it's crucial to find new treatments to help beat the disease.
"When melanoma is diagnosed early, treatment is often simpler and more likely to be effective. If you notice a change in the size, shape or colour of a mole or other patch of skin, make sure you get it checked out by your doctor without delay.
"Excessive exposure to ultraviolet radiation, from the sun or from sunbeds, is the leading cause of skin cancer.
"With this year's summer expected to be hotter than the last, it's important that we don't let sunburn catch us out. Whether at home or abroad, use shade, clothing and sunscreen of SPF 15 or higher to protect your skin."

http://news.bbc.co.uk/2/hi/health/8076743.stm

Distant world circles tiny star



The planet might have about the same girth as its star

A distant "sun" residing in the constellation Aquila has become the smallest star known to host a planet.

The discovery of a Jupiter-like "exoplanet" orbiting the star VB 10 is the first to be made using the astrometry method.
Astrometry is based on measuring small changes in a star's position.
At one-twelfth the mass of the Sun, VB 10 is tiny; though the star is more massive than its planet, it would have about the same girth, experts say.
Astrometry has long been proposed as a tool for finding other planets, but this is the method's first "catch".
The results are to be published in an upcoming edition of the Astrophysical Journal.
Using astrometry to find exoplanets involves measuring the precise motions of a star on the sky as an unseen planet tugs the star back and forth. It is best suited to finding planets with large orbits around their parent stars.
But the method requires very precise measurements over long periods of time.

Gas giant
The newfound planet, VB 10b, is a gas giant with a mass six times that of Jupiter that lies 20 light-years away. Scientists think the planet's own internal heat would give it an Earth-like temperature.
Lead author Steven Pravdo, from Nasa's Jet Propulsion Laboratory in Pasadena, US, commented: "We found a Jupiter-like planet at around the same relative place as our Jupiter, only around a much smaller star.
"It's possible this star also has inner rocky planets. And since more than seven out of 10 stars are small like this one, this could mean planets are more common than we thought."
If there are other planets there, this solar system could be a miniature, scaled-down version of our own.
The discovery was the outcome of meticulous, intermittent observations of 30 stars.

Two to six times a year, for the past 12 years, Dr Pravdo and Stuart Shaklan, also from JPL, have bolted their Stellar Planet Survey instrument on to the Palomar Observatory's 5m Hale telescope to search for planets.

Planet hunt

The instrument, which has a 16-megapixel charge-coupled device (CCD) can detect minuscule changes in the positions of stars.

VB 10b causes its star to wobble a small fraction of a degree. Detecting this wobble is equivalent to measuring the width of a human hair from about 3km away.

In wider use as planet-hunting techniques are the radial velocity and the transit methods.

Like astrometry, radial velocity detects the "wobble" of a star, but it measures Doppler shifts in the star's light caused by its motion towards and away from us.

The transit method looks for dips in a star's brightness as orbiting planets pass by and block the light.

Nasa's Kepler space telescope, which was launched on 6 March, will use the transit method to search for Earth-like worlds around stars similar to the Sun.

http://news.bbc.co.uk/2/hi/science/nature/8077302.stm

Droppings put penguins on the map

By Jason Palmer
Science and technology reporter, BBC News

Emperor penguins cluster together on breeding grounds for months at a time

Scientists have located 38 emperor penguin colonies in Antarctica by using satellites to look for stains from the animals' droppings.
It is impossible to track the penguins themselves using standard satellite imaging because they are too small.
However, penguins cluster for up to eight months on sea ice; as their guano builds up it leaves a reddish-brown mark on sea ice that is easier to spot.
The survey of colonies is published in Global Ecology and Biogeography.
"We were mapping one of our bases on an ice shelf, and we knew there was a penguin colony close to there," said Peter Fretwell, a geographer at the British Antarctic Survey.
Satellite images clearly reveal the penguins' movements
"I was using a satellite image as a backdrop for the map and it happened to have a reddish-brown stain on one of the creeks that was a possible location for the emperor penguin colony."
"It was quite a lucky find because just a few months beforehand, we had made a mosaic of these satellite images of the whole of Antarctica, so we could go round and track all the colonies."
Comparing their satellite image stains with the known locations of emperor penguin colonies, the team identified 10 previously unknown colonies, and found that six known colonies had recently moved a significant distance.
Six more known colonies had disappeared altogether.

"We know that emperor penguins rely on sea ice to breed - like the polar bears in the Arctic depend on sea ice for their hunting. Although the sea ice at the moment is reasonably stable, we know that in future decades it will decrease rapidly," Mr Fretwell added.
"We need to know where they are and to assess how many there are before we can really work out how threatened they are by climate change."

http://news.bbc.co.uk/2/hi/science/nature/8077040.stm

'Oldest pottery' found in China

By Jason Palmer
Science and technology reporter, BBC News

The team dug in small areas to gather more precisely dated samples

Examples of pottery found in a cave at Yuchanyan in China's Hunan province may be the oldest known to science.
By determining the fraction of a type, or isotope, of carbon in bone fragments and charcoal, the specimens were found to be 17,500 to 18,300 years old.
The authors say that the ages are more precise than previous efforts because a series of more than 40 radiocarbon-dated samples support the estimate.
The work is reported in the Proceedings of the National Academy of Sciences.
The Yuchanyan cave was the site where the oldest kernels of rice were found in 2005, and it is viewed as an important link between cave-dwelling hunter-gatherer peoples and the farmers that arose later in the basin of the nearby Yangtze River.

“Archaeologists before haven't looked at this closely enough to realise what's going on in caves”

David Cohen
Boston University
The previous oldest-known example of pottery was found in Japan, dated to an age between 16,000 and 17,000 years ago, but debate has raged in the archaeological community as to whether pottery was first made in China or Japan.
The most recent dig at Yuchanyan was in 2005 by a team led by Elisabetta Boaretto of the Kimmel Center for Archaeological Science at the Weizmann Institute of Science in Israel. They believe they have found a more precise way to read the history of human activity written in layers of sediment, or stratigraphy.
'Layer cake'
"The way people move around and mess up caves is very difficult to see archaeologically," David Cohen, an archaeologist at Boston University and a co-author on the research, told BBC News.

"Imagine you have a fire and then people come in again have another fire and another, so you have the ashes of all these fires building up but at the same time people are digging and clearing, pushing things to the side; this messes things up.
Fragments from a 1995 dig at Yuchanyan form a cauldron
"If you have an open-air site, you sometimes get a very clean 'layer cake' stratigraphy. Archaeologists before haven't looked at this closely enough to realise what's going on in caves so they interpret this stratigraphy as a layer cake. But in actuality, it's 'lenses' of stuff that's been mixed up and moved around."
It is comparatively easy to find evidence of human occupation in caves through the dating of charcoal from fires or bones from long-ago dinners, Dr Cohen said. However, because of the unclear layering of sediment it is not easy to correlate well-dated layers with the pottery that may be nearby.
Part of the problem lies in the areas over which previous digs have searched: squares of perhaps five metres on a side.
"It's an issue of association, knowing where everything comes from in space across the cave," Dr Cohen explained. "If you're excavating in a huge unit, you can only say it comes from within this 5m area and this 20cm of sediment, and that's not good enough for understanding human activity."
Instead, the team worked in sub-divisions of just a quarter of a metre square, painstakingly collecting bone and charcoal fragments. The samples were then radiocarbon dated, revealing a clean distribution stretching between 14,000 and 21,000 years ago.

'Fantastic cave'

One fragment of pottery was found in a layer between two radiocarbon-dated fragments that both measured about 18,000 years old, taking the record for oldest pottery.
The team hope that their smaller-scale searching and taking into account the effects of human activity on cave stratigraphy will help with future digs at Yuchanyan, and elsewhere.
"It's a fantastic cave, and we hope that the way these excavations were done would set a precedent for how other caves will be looked at," said Dr Cohen.
Dr Tracey Lu, from an anthropologist at the Chinese University of Hong Kong, who was not an author on the latest study, noted that the dates reported in this paper were slightly older than dates on pottery found in Japan.
However, she said the accuracy of radiocarbon dates in the limestone area has been under debate for many years.
"I agree that pottery was made by foragers in South China," she told the Associated Press news agency.
"But I also think pottery was produced more or less contemporaneously in several places in East Asia... from Russia, Japan to North and South China by foragers living in different environments."

http://news.bbc.co.uk/2/hi/science/nature/8077168.stm

Zap! Wrinkles And Sun Spots Be Gone

Woman receives laser treatment. (Credit: Image courtesy of University of Michigan)

ScienceDaily (June 2, 2009) — When she looked in the mirror, 48 year-old Margaret Miglia didn't like what she saw. To combat the fine lines and brown spots that began to appear on her face with age, she sought help at the University of Michigan Cosmetic Dermatology and Laser Center where she received a new, non-surgical skin resurfacing treatment using a fractionated carbon dioxide laser."Previous laser treatment for wrinkles and other textural issues like acne scarring used to create significant wounding," says Jeffrey Orringer, M.D., director of the U-M Cosmetic Dermatology and Laser Center. "While results were terrific, the downtime for patients was substantial, and the risks were significant. Then, as technology improved, the pendulum swung the other way, providing lower risks, but with less pronounced results. This new treatment offers both improved results with much fewer side effects."

In developing this new treatment method, traditional carbon dioxide lasers were modified into a fractional format. The carbon laser beam is broken into numerous microscopically thin beams that strike the skin and vaporize sun damaged or scarred tissue. This causes the skin to tighten, and during healing, produce collagen – the protein responsible for skin structure and appearance.

"The little micro-beams essentially vaporize small columns of tissue that take about two to three days to seal back up," Orringer says. "During that time, as the skin heals back together, the lost volume essentially creates a tightening of the skin. In addition, around those columns of skin where the beam delivers heat, a very reproducible wound healing mechanism is created, which leads in part to the formation of new collagen in the skin."

In addition to smoothing fine lines and wrinkles, Orringer says patients who undergo fractionated carbon dioxide laser treatment can expect a more even skin tone, as well as results that last for years, not weeks or months."Collagen, the molecule that this procedure is really trying to get the body to produce, has a half life of about 15 years. We would expect that, to the extent that patients' improvement is based on collagen production, their results would last a very long time," he says.

For Miglia, she couldn't be happier. "I had the procedure done two and a half weeks ago and I love it. The experience for me was not really painful at all. It was more like a really bad sun burn. My skin is smooth. The brown spots on my face are gone," she says. "It makes me feel much younger. It just feels good to look in the mirror."

Treatment

The procedure takes about 45 to 90 minutes. Patients will arrive about an hour in advance of their appointment. A topical anesthetic cream is applied to the area being treated and allowed to soak for in for about an hour.

Patients are then given tiny injections of lidocaine to additionally numb the most sensitive parts of the face.

To ensure wrinkles are eliminated as close to the eyes as possible, patients are given protective eye shields so the laser can be applied to the skin up to the eyelash line."Patients are generally treated in two passes. The first pass acts very deeply on the skin, working on deeper lines, atrophic scars and the like," Orringer says. "The second, more superficial pass, typically focuses more on blending skin tones and getting rid of sun spots and uneven pigmentation."

Recovery and results

While the immediate effects of laser treatment include redness, swelling and oozing of clear fluids called serum, initial healing essentially occurs within three to four days. The serum, which contains proteins that help the skin to heal, continues to seep out onto the surface of the skin periodically during the first couple of days as the microscopic holes begin to seal off. Orringer says by the third or fourth day there's essentially no wound care required other than applying a thick moisturizer. Redness gradually dissipates in about one or two weeks for most patients.

"Patients experience an immediate improvement during treatment associated with the laser heating their skin. The collagen contracts making the skin appear immediately tighter," Orringer says. "However, even better is the type of improvement related to collagen production which takes several weeks to a couple of months to fully appear. Patients will continue to see improvements in their skin for the first three to four months following treatment."

Risks

As with any surgical procedure or medical treatment, there are risks. For fractionated carbon dioxide laser treatment, Orringer says the risks are fairly small. "Concerns like infection and scarring or discoloration of the skin are certainly theoretical possibilities, and it is something that patients should always discuss with their treating physician," he says.

For those who are considering undergoing fractionated carbon laser treatment, Orringer stresses that they should consider the setting in which they intend to undergo the procedure.

"Who will be performing the treatment? Which exact device will be used? And, especially, what is the training level of the team that's going to be doing the procedure?" he says. "Regulation of laser use varies widely from state-to-state. This is a moderately invasive procedure that in some places is legally performed by non-medical personnel. Though the treatment is very safe when performed by experienced doctors, complications may occur. In my opinion, patients should seek out a physician with specialized training in laser therapy."

Adapted from materials provided by University of Michigan.

http://www.sciencedaily.com/releases/2009/06/090601190433.htm

Height Of Large Waves Changes According To Month

Waves on the coast of Gijon (Asturias). (Credit: Fernando Torre Alonso)

ScienceDaily (June 2, 2009) — A team of researchers from the University of Cantabria has developed a statistical model that makes it possible to study the variability of extreme waves throughout the year. Their study has shown that there are seasonal variations in the height of waves reaching Spain's coasts, and stresses the importance of this data in planning and constructing marine infrastructures."Anybody who observes waves can see that they are not the same height in winter and summer, but rather that their height varies over time, and we have applied a 'non- seasonal' statistical model in order to measure extreme events such as these," says Fernando J. Méndez, an engineer at the Institute of Environmental Hydraulics at the University of Cantabria and co-author of a study published recently in the journal *Coastal Engineering*.

The new model can chart the pattern of extreme waves "with a greater degree of reliability", by studying 'significant wave height' (Hs) in relation to a specific return period. The Hs is the representative average height of the sea, provided by buoys (it is calculated by measuring one in three of the highest waves), and the return period is the average time needed for the event to happen.For example, if a wave height of 15 metres is established at a certain point on the coast with a return period of 100 years, this means that, on average, a wave of 15 metres could reach this point once every 100 years. "This can be very useful when it comes to building an oil platform in the sea or a particular piece of coastal infrastructure", explains Méndez.

The researchers have used data recorded between 1984 and 2003 by five coastal buoys located near the cities of Bilbao, in Vizcaya; Gijón, in Asturias; La Coruña, Cádiz and Valencia in order to demonstrate the validity of their model. The results show that extreme Hs values vary according to location and the month of the year.

The meteorological component of extreme waves

The results showed a similar seasonal variation between waves in Bilbao and Gijón, with waves being less than four metres high between May and September, but increasing after this to reach an average

height of seven metres between December and January. The period of large waves in La Coruña extends from October to April, because of the city's westerly position and resulting exposure to more prolonged winter storms.

The Atlantic coast of Cádiz, meanwhile, reflects the characteristic calm of this area of sea between July and September, with Hs values below two metres. The figures for December and January, however, can vary a great deal from one year to another, reaching wave heights in excess of six metres.Waves on the Mediterranean coast at Valencia measure between 3 and 3.5 metres from September until April, although the graphics reveal two peaks during this period, one of which coincides with the start of spring and the other with the autumn months, during which the phenomenon of the gota fría occurs. (Gota fría events are atmospheric cold air pools that cause rapid, torrential and very localised downpours and high winds).

"All these data are of vital importance in terms of coastal management, since they can establish the risk of flooding and are indispensable for the carrying out of marine construction work, for example infrastructure built close to the coast," says Melisa Menéndez, another of the study's authors. "In addition, they make it possible to calculate the likelihood of a maritime storm occurring."

The researcher also stresses that this information could be very useful in helping to better understand some biological processes, such as how the distribution of marine animals is affected by wave swell, and seaweed growth rates, as well as geological processes, such as how particulates and sediments are transported along the coast.

Extreme value theory

The model developed by the Spanish scientists is based on 'extreme value theory', a recently-developed statistical discipline that aims to quantify the random behaviour of extreme events. The latest advances in this field have made it possible to better study climatic variability at various scales - over a year (seasonality), over consecutive years or decades (which allows climatic patterns to be derived), and over the long term (providing trends).

The study into extreme waves is on the seasonal scale, but the team has also studied extreme sea level values over almost a 100-year period, thanks to data gathered during the 20th Century by a mareograph located in Newlyn, in the United Kingdom. The scientists have already started to obtain information about extreme swell and sea level values at global level as part of a United Nations project to study the sea's impacts on coasts all over the planet, and how these affect climate change.

Journal references:

1. Melisa Menéndez, Fernando J. Méndez, Cristina Izaguirre, Alberto Luceño e Inigo J. Losada. **The influence of seasonality on estimating return values of significant wave height**. *Coastal Engineering*, 2009; 56 (3): 211 DOI: 10.1016/j.coastaleng.2008.07.004
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Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/05/090529085119.htm

Continuous Glucose Monitoring Technology: Promising New Tool For Maintaining Optimal Glucose Control

ScienceDaily (June 2, 2009) — Continuous Glucose Monitoring (CGM) devices represent a critical step toward achieving automated glucose measurement, offering people with diabetes a promising new tool for maintaining optimal glucose control. A comprehensive review of this rapidly changing field, featuring the most recent research findings and critical analysis, is the focus of a special supplement of Diabetes Technology & Therapeutics, a peer-reviewed journal published by Mary Ann Liebert, Inc.

The supplement is available free online at http://www.liebertonline.com/dia

"CGM is still in its infancy, yet this technology is already becoming the standard of care," writes Satish K. Garg, MD, Editor-in-Chief of Diabetes Technology & Therapeutics, and Professor of Medicine and Pediatrics from the University of Colorado Denver, in an editorial introducing the supplement. Over the past decade, "The annual healthcare costs related to diabetes care in the United States have increased significantly by 32%...to $174 billion," despite improvements in glucose control, Garg notes. Better methods are needed to prevent the long- and short-term complications associated with diabetes.

This in-depth supplement provides a detailed presentation of the need for better glucose monitoring techniques, describes state-of-the-art CGM technology, and looks to the future and the ultimate goal of integrating CGM with an artificial pancreas to simulate normal blood glucose control systems in the body. Several articles focus on the challenges that CGM must still overcome, whether technical, practical, or economic. In the editorial, "Do We Really Need Continuous Glucose Monitoring?" Anne Peters, MD, from the University of Southern California Keck School of Medicine (Los Angeles), points out some of the drawbacks of current CGM technology: for example, the devices are "finicky and require care and calibration leading patients to use them infrequently"; "few physicians know how to interpret the data"; and "CGM devices have not been shown to reduce rates of severe hypoglycemia."

Associate Editor Jay S. Skyler, MD, from the University of Miami Miller School of Medicine (Florida), reviews the history of CGM in an editorial entitled, "Continuous Glucose Monitoring: An Overview of Its Development." Eric Orzeck, MD, from Endocrinology Associates (Houston, TX), describes the need for better documentation, coding, and appeal procedures for use of CGM to improve insurance coverage, in the article, "Maximizing Reimbursement through Correct Coding Initiatives."

In the commentary entitled, "Continuous Glucose Monitoring: Understanding Our Current Culture," Irl Hirsch, MD, from the University of Washington School of Medicine (Seattle), concludes that CGM, "is only a tool to help patients make better decisions about insulin and food. Until we have a closed-loop system or islet cell transplant, human behavior will continue to dictate the success of a patient with his or her diabetes control."

Adapted from materials provided by Mary Ann Liebert, Inc./Genetic Engineering News, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090529112532.htm

Improving The Catalytic Converters Of Motor Vehicles

ScienceDaily (June 2, 2009) — The chemical mechanism that occurs on the surface of an automotive catalytic converter has been deciphered thanks to an observation speed record established by Frédéric Thibault-Strarzyk at the Laboratoire Catalyse et Spectrochimie in Caen (CNRS-Ensicaen).

This performance, achieved in collaboration with the University of Cambridge, has made it possible to characterize this key step in the reaction that ensures pollutant removal by automotive converters. The challenge is indeed considerable: to obtain a clearer understanding of the mechanisms of removal catalysts in order to improve converters and other catalysts used by the automotive industry.

These results were published in *Science* on May 22, 2009.

A catalytic converter included in a vehicle's exhaust system is a solid element that converts the toxic gases generated by the engine into a mixture of inoffensive gases. Although these catalysts are widely employed, their chemical mechanisms have hitherto been poorly understood.

In addition to improving catalytic converters, this observation technique will also help to understand many of the other pollutant removal systems used by industry.

The observation of very fleeting types of catalysts in the context of these mechanisms is particularly challenging. Until now, the most rapid observations of the surface of these catalysts using infrared methods were around one-tenth of a second.

A novel combination of observation methods has now reduced the duration of observations by a factor of one million.

This manipulation was achieved using a femtosecond laser which was focused on the surface of the solid catalyst made up of silver nanoparticles on an alumina substrate and placed in an atmosphere of toxic gases, thus recreating the conditions of a converter in an exhaust system. As soon as the reaction was triggered by the laser beam, an infrared spectrometer analyzed the surface of the catalyst at a rate of 30 million observations per second. The key intermediate step in the removal reaction was thus observed for the first time and consisted in a cyanide flip between the silver nanoparticles and the substrate. This molecular flip only lasted 2 microseconds and indeed explains how the removal catalyst functions.

Journal reference:

1. Frédéric Thibault-Starzyk, Etienne Seguin, Sébastien Thomas, Marco Daturi, Heike Arnolds, and David A. King. **Real-Time Infrared Detection of Cyanide Flip on Silver-Alumina NOx Removal Catalyst**. *Science*, 2009; 324 (5930): 1048 DOI: 10.1126/science.1169041

Adapted from materials provided by CNRS (Délégation Paris Michel-Ange).

http://www.sciencedaily.com/releases/2009/05/090529075000.htm

Mosquito Evolution Spells Trouble For Galapagos Wildlife

Galapagos giant tortoise. (Credit: Penelope Curtis)

ScienceDaily (June 2, 2009) — The Galapagos giant tortoise and other iconic wildlife are facing a new threat from disease, as some of the islands' mosquitoes develop a taste for reptile blood.

Scientists from the University of Leeds, the Zoological Society of London (ZSL) and the Galapagos National Park have discovered that while its mainland ancestors prefer the blood of mammals and the occasional bird, the Galapagos form of the black salt marsh mosquito (*Aedes taeniorhynchus*) has shifted its behaviour to feed mainly on reptiles – primarily Galapagos giant tortoises and marine iguanas.

The findings raise fears that these changes could devastate the islands' unique native wildlife if a new mosquito-borne disease is introduced - a scenario which is increasingly likely with the continuing rise in tourism.

Using genetic techniques, the researchers showed that the mosquito colonised the Galapagos around 200,000 years ago and was not introduced by humans as previously thought, giving them time to adapt to conditions in Galapagos. They have also found that unlike the mainland populations that normally live in mangroves and salt marshes along the coast, the Galapagos form of the mosquito can also breed up to 20 km inland and at altitudes of up to 700 metres. The research team believe the shift in feeding behaviour is an adaptation to life in Galapagos, since the islands had few mammal species prior to the arrival of Man some 500 years ago.

"When we started the work we thought that this species was also introduced by humans, so it was a surprise that it turned out to be so ancient," says Arnaud Bataille, the University of Leeds and ZSL PhD student who carried out the work. "The genetic differences of the Galapagos mosquitoes from their mainland relatives are as large as those between different species, suggesting that the mosquito in Galapagos may be in the process of evolving into a new species."

Mosquitoes are known to transmit important wildlife diseases, such as avian malaria and West Nile fever. While there is no evidence that such diseases are currently present on Galapagos, the widespread presence of the mosquito, and the fact that it feeds on a broad range of the native species, means that any new

disease that arrives from the continent could spread rapidly to a wide variety to wildlife throughout the islands. Due to its long isolation, Galapagos wildlife is not likely to have much immunity to new diseases, so the effects could be devastating.

"With tourism growing so rapidly the chance of a disease-carrying mosquito hitching a ride from the mainland on a plane is also increasing, since the number of flights grows in line with visitor numbers" says Dr Andrew Cunningham, from the Zoological Society of London, one of the authors of the study. "If a new disease arrives via this route, the fear is that Galapagos' own mosquitoes would pick it up and spread it throughout the archipelago."

Rather than implementing control measures against Galapagos' own unique mosquito, the research team argues that it is imperative that measures are taken to avoid introducing new diseases to the islands.

The Ecuadorian government recently introduced a requirement for planes flying to Galapagos to have a residual insecticide treatment on the interior surfaces, and spraying in the hold and cabin on each flight. However, similar controls are yet to be implemented for ships.

Co-author Dr Simon Goodman, of Leeds' Faculty of Biological Sciences says: "It is absolutely vital that these control measures are maintained and carried out rigorously, otherwise the consequences could be very serious indeed."

Journal reference:

1. . **Natural colonization and adaptation of a mosquito species in Galapagos and its implications for disease threats to endemic wildlife**. *Proceedings of the National Academy of Sciences*, DOI: 10.1073/PNAS.0901308106

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

http://www.sciencedaily.com/releases/2009/06/090601182812.htm

Einstein's General Theory Of Relativity: Celebrating The 20th Century's Most Important Experiment

The story as reported in the 22nd November 1919 edition of the 'Illustrated London News'. (Credit: Image courtesy of Royal Astronomical Society)

ScienceDaily (June 2, 2009) — In 1919, the Royal Astronomical Society (RAS) launched an expedition to the West African island of Príncipe, to observe a total solar eclipse and prove or disprove Einstein's General Theory of Relativity. Now, in a new RAS-funded expedition for the International Year of Astronomy (IYA 2009), scientists are back.

Astronomers Professor Pedro Ferreira from the University of Oxford and Dr Richard Massey from the University of Edinburgh, along with Oxford anthropologist Dr Gisa Weszkalnys, are paying homage to the original expedition led by Sir Arthur Eddington and celebrating the 90th anniversary of one of the key discoveries of the 20th century. Einstein first proposed his General Theory of Relativity in 1915. It describes how any massive object, such as the Sun, creates gravity by bending space and time around it. Everything in that space is also bent: even rays of light. Consequently, distant light sources, behind the massive object, can appear in a different position or look brighter than they would otherwise.

The total eclipse of 29th May 1919 gave scientists the chance to test the theory for the first time. Eddington travelled to Príncipe to observe the eclipse and measure the apparent locations of stars near the Sun. Heavy clouds parted minutes before the eclipse and, with the Sun almost directly in front of them, the stars appeared to be shifted from the positions that Eddington had recorded in Oxford 4 months earlier – direct evidence that our nearest star shapes the space around it.

"This first observational proof of General Relativity sent shockwaves through the scientific establishment," said Professor Ferreira. "It changed the goalposts for physics."To mark the anniversary, in partnership with the International Astronomical Union, São Toméan and Portuguese governments, the

team will gather with local people for a series of public talks, the installation of an exhibition in the capital Santo António, and the unveiling of a plaque at the plantation where the original observation was made. Dr. Weszkalnys feels it "particularly important that in 2009, the International Year of Astronomy, the dramatic role played in the history of science by a tiny island like Príncipe should not be forgotten."

Eddington's 1919 measurement of the bending of light was used to determine the nature of gravity. At the time, even Einstein saw no further uses. "But now that gravity is well understood," said Dr. Massey, "the effect, known as 'gravitational lensing', has become one of our most powerful tools to study the Universe."

Gravitational lenses work in a similar way to ordinary glass lenses, focusing and magnifying light – but on a huge scale. They enable astronomers like Dr Massey to see objects that are otherwise too far away or faint for even the largest telescopes on Earth.

Adapted from materials provided by Royal Astronomical Society (RAS).

http://www.sciencedaily.com/releases/2009/05/090528204402.htm

High Arctic Mammals Wintered In Darkness 53 Million Years Ago

A hippo-like mammal known as Coryphodon was one of several ancient mammal groups that endured twilight winters in the high Arctic 53 million year ago, according to a new study led by the University of Colorado at Boulder. (Credit: Copyright American Museum of Natural History/D. Finnin)

ScienceDaily (June 1, 2009) — Ancestors of tapirs and ancient cousins of rhinos living above the Arctic Circle 53 million years ago endured six months of darkness each year in a far milder climate than today that featured lush, swampy forests, according to a new study led by the University of Colorado at Boulder.CU-Boulder Assistant Professor Jaelyn Eberle said the study shows several varieties of prehistoric mammals as heavy as 1,000 pounds each lived on what is today Ellesmere Island near Greenland on a summer diet of flowering plants, deciduous leaves and aquatic vegetation. But in winter's twilight they apparently switched over to foods like twigs, leaf litter, evergreen needles and fungi, said Eberle, curator of fossil vertebrates at the University of Colorado Museum of Natural History and chief study author.

The study has implications for the dispersal of early mammals across polar land bridges into North America and for modern mammals that likely will begin moving north if Earth's climate continues to warm. A paper on the subject co-authored by Henry Fricke of Colorado College in Colorado Springs and John Humphrey of the Colorado School of Mines in Golden appears in the June issue of *Geology.*The team used an analysis of carbon and oxygen isotopes extracted from the fossil teeth of three varieties of mammals from Ellesmere Island -- a hippo-like, semi-aquatic creature known as Coryphodon, a second, smaller ancestor of today's tapirs and a third rhino-like mammal known as brontothere. Animal teeth are among the most valuable fossils in the high Arctic because they are extremely hard and better able to survive the harsh freeze-thaw cycles that occur each year, Eberle said.

Telltale isotopic signatures of carbon from enamel layers that form sequentially during tooth eruption allowed the team to pinpoint the types of plant materials consumed by the mammals as they ate their way across the landscape through the seasons, Eberle said.

"We were able to use carbon signatures preserved in the tooth enamel to show that these mammals did not migrate or hibernate," said Eberle. "Instead, they lived in the high Arctic all year long, munching on some unusual things during the dark winter months." The study was funded by the National Science Foundation.

An analysis of oxygen isotopes from the fossil teeth helped determine seasonal changes in surface drinking water tied to precipitation and temperature, providing additional climate information, said Eberle. The results point to warm, humid summers and mild winters in the high Arctic 53 million years ago, where temperatures probably ranged from just above freezing to near 70 degrees Fahrenheit, Eberle said.

The environment on central Ellesmere Island, located at about 80 degrees north latitude, was part of a much larger circumpolar Arctic region at the time, she said. It probably was similar to swampy cypress forests in the southeast United States today and still contains fossil tree stumps as large as washing machines, Eberle said.

On central Ellesmere Island in today's high Arctic -- a polar desert that features tundra, permafrost, ice sheets, sparse vegetation and a few small mammals -- the temperature ranges from roughly minus 37 degrees F in winter to 48 degrees F in summer and is the coldest, driest environment on Earth. There is sunlight in the high Arctic between October and February, and the midnight sun is present from mid-April through the end of August.

The year-round presence of mammals such as the hippo-like Coryphodon, tapirs and brontotheres in the high Arctic was a "behavioral prerequisite" for their eventual dispersal across high-latitude land bridges that geologists believe linked Asia and Europe with North America, Eberle said. Their dietary chemical signatures, portly shapes and fossil evidence for babies and juveniles in the Arctic preclude the idea of long, seasonal migrations to escape the winter darkness, she said."In order for mammals to have covered the great distances across land bridges that once connected the continents, they would have required the ability to inhabit the High Arctic year-round in proximity to these land bridges," Eberle said.

Instead, the animals likely made their way south from the Arctic in minute increments over millions of years as the climate shifted. "This study may provide the behavioral smoking gun for how modern groups of mammals like ungulates -- ancestors of today's horses and cattle -- and true primates arrived in North America," said Eberle, also an assistant professor in CU-Boulder's geological sciences department.The surprising menagerie of Arctic creatures during the early Eocene epoch, which lasted from roughly 50 million to 55 million years ago, first became evident in 1975 when a team led by Mary Dawson of the Carnegie Museum of Natural History in Pittsburg discovered fossil alligator jaw bones. Since then, fossils of aquatic turtles, giant tortoises, snakes and even flying lemurs -- one of the earliest forms of primates -- have been found on Ellesmere Island, said Eberle.

The new Geology study also foreshadows the impacts of continuing global warming on Arctic plants and animals, Eberle said. Temperatures in the Arctic are rising twice as fast as those at mid-latitudes as greenhouse gases build up in Earth's atmosphere from rising fossil-fuel burning, and air temperatures over Greenland have risen by more than 7 degrees F since 1991, according to climate scientists."We are hypothesizing that lower-latitude mammals will migrate north as the temperatures warm in the coming centuries and millennia," she said. If temperatures ever warm enough in the future to rival the Eocene, there is the possibility of new intercontinental migrations by mammals."

Because the oldest known tapir fossils are from the Arctic, there is the possibility that some prehistoric mammals could have evolved in the circumpolar Arctic and then dispersed through Asia, Europe and North America, said Eberle. "We may have to re-think the world of the early Eocene, when all of the Arctic land masses were connected in a supercontinent of sorts," she said.

Adapted from materials provided by University of Colorado at Boulder.

http://www.sciencedaily.com/releases/2009/06/090601140932.htm

Exact Replication Of Facial Expressions Challenge Assumptions About Human Behavior

ScienceDaily (June 1, 2009) — Computer scientists at the University of East Anglia (UEA) have developed a new way of cloning facial expressions during live conversations to help us better understand what influences our behaviour when we communicate with others.

The new technique tracks in real time facial expressions and head movements during a video conference and maps these movements to models of faces – producing a 'cloned' face.

These facial expressions and head movements can be manipulated live to alter the apparent expressiveness, identity, race, or even gender of a talker. Moreover, these visual cues can be manipulated such that neither participant in the conversation is aware of the manipulation.

Developed by Dr Barry-John Theobald of UEA's School of Computing Sciences, in collaboration with Dr Iain Matthews (Disney Research), Prof Steven Boker (University of Virginia) and Prof Jeffrey Cohn (University of Pittsburgh), the new facial expression cloning technique is already being trialed by psychologists in the US to challenge pre-conceived assumptions about how humans behave during conversations.

For example, it is well-known that you move your head differently when speaking to a woman than when speaking to a man. The new software has helped show that this difference is not because of your conversational partner's appearance, but instead due to the way they move. If a person appears to be a woman but moves like a man, others will respond with movements similar to those made when speaking to a man.

It is also likely to have application in the entertainment industry where life-like animated characters might be required.

"Spoken words are supplemented with non-verbal visual cues to enhance the meaning of what we are saying, signify our emotional state, or provide feedback during a face-to-face conversation," said Dr Theobald, lead author of the new paper. "Being able to manipulate these properties in a controlled manner allows us to measure precisely their effects on behaviour during conversation.

"This exciting new technology allows us to manipulate faces in this way for the first time. Many of these effects would otherwise be impossible to achieve, even using highly-skilled actors."

The work is funded by the Engineering and Physical Sciences Research Council (EPSRC) and the National Science Foundation (NSF).

Journal reference:

1. Barry-John Theobald, Iain Matthews, Michael Mangini, Jeffrey Spies, Timothy Brick, Jeffrey Cohn and Steven Boker. **Mapping and Manipulating Facial Expression**. *Language and Speech*, June, 2009

Adapted from materials provided by University of East Anglia.

http://www.sciencedaily.com/releases/2009/06/090601090113.htm

Wiping Out The World's Mass Migrations: First Analysis Of The Effect Of Habit Changes On Migrating Grazers

These are pronghorn (Antilocapra americana) running in snow. (Credit: J. Berger/WCS)

ScienceDaily (June 1, 2009) — Densely packed wildebeests flowing over the Serengeti, bison teeming across the Northern Plains—these iconic images extend from Hollywood epics to the popular imagination. But the fact is, all of the world's large-scale terrestrial migrations have been severely reduced and a quarter of the migrating species are suspected to no longer migrate at all because of human changes to the landscape. A recently published research paper highlights this global change and presents the first analysis of the dwindling mass migrations.

"Conservation science has done a poor job in understanding how migrations work, and as a result many migrations have gone extinct," says Grant Harris of the Center for Biodiversity and Conservation at the American Museum of Natural History, first author of the paper in *Endangered Species Research*. "Fencing, for example, blocks migratory routes and reduces migrant's access to forage and water. Migrations can then stop, or be shortened, and animal numbers plummet."

Migrations of large-bodied herbivores (also called ungulates) occur when animals search for higher quality or more abundant food. Ecologically, there are two primary drivers of food availability. In temperate regions of the world, higher-quality food shifts predictably as the seasons change, and animals respond by moving along well-established routes. For savannah ecosystems, rain and fire allow higher-quality food to grow. This is a less predictable change that animals must track across expansive landscapes.

Human activity now prevents large groups of ungulates from following their food. Fencing, farming, and water restrictions have changed the landscape and over-harvesting of the animals themselves has played a role in reducing the number of migrants.

To assess the impact of human activity on migrations throughout the world, Harris and his co-authors gathered information on all 24 species of large (over 20 kilograms) ungulates known for their mass migrations. Animals included in the study, for example, range over Arctic tundra (Caribou), Eurasian steppes and plateaus (Chiru and Saiga), North American plains (bison and elk), and African savannahs (zebra and wildebeests). The fewest number of mass-migrating species live in the Americas, and this is the location where the most data exists. Evaluating the human impact on migratory species in Africa and Eurasia is hampered by a lack of scientific data: in Africa—where most of the large-scale migrations remain—three species have no scientific publications on their status, and in Eurasia half of the six remaining migratory species are very poorly documented.

All 24 species in the current study lost migration routes and were reduced in number of individuals. In North America, bison are still considered migratory, but their range is now restricted from the Great Plains to two small sites in Yellowstone and Alberta. Similar changes are found on other continents when human activity limits the ability of species to move to new patches of food. The analysis found even more drastic curbing for six species in particular. The springbok (*Antidorcas marsupialis*), black wildebeest (*Connochaetes gnou*), the blesbok (*Damaliscus dorcas*), and quagga (*Equus quagga*) of southern Africa; the kulan (*Equus hemionus*) of central Asia; and scimitar horned oryx (*Oryx dammah*) of northern Africa either no longer migrate or are impossible to evaluate as migratory animals.

"If we are going to conserve migrations and species, we need to identify what needs to be done: where migrations remain, how far animals move, their habitat needs and location, threats, and the knowledge gaps needed to be filled," says co-author Joel Berger of the Wildlife Conservation Society and the University of Montana. "For some of these species, such as the wildebeest and eland in Botswana, threats were identified decades ago. We as a society have made little progress at figuring out how to save migrations."

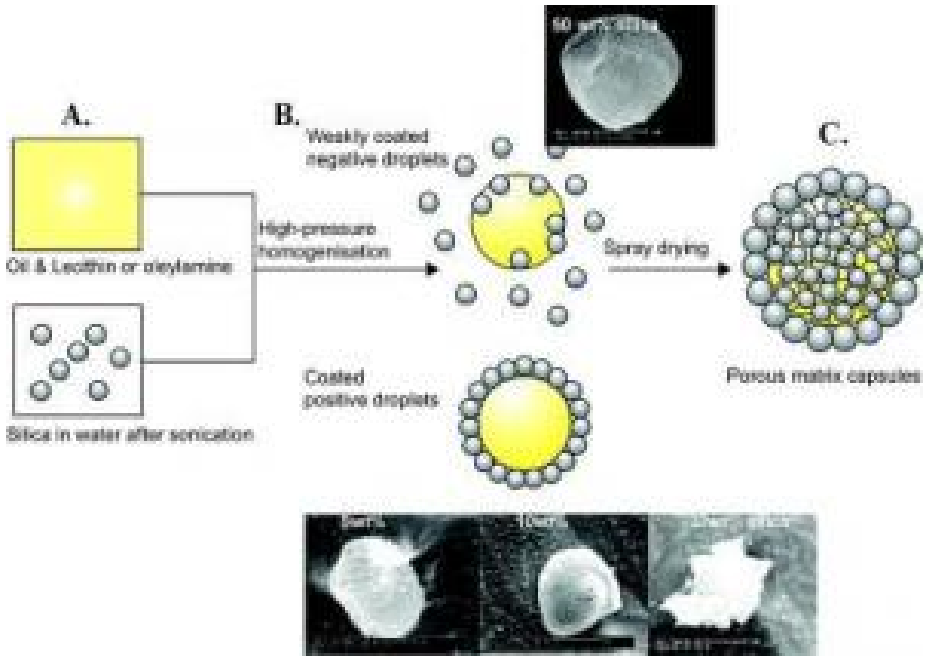
"A large part of this is an awareness issue. People don't realize what we have and are losing," says Harris. "We lose migrations and become biologically depauperate with farms and fences, even though there is no reason why humanity cannot technically and socially advance while maintaining natural phenomena. A balance can be struck—we just need to strike it."

In addition to Harris and Berger, authors on this research paper include Simon Thirgood and J. Grant Hopcraft of the Frankfurt Zoological Society in Tanzania, and Joris Cromsigt of the Mammal Research Institute at the Polish Academy of Sciences. The research was supported by the John D. and Catherine T. MacArthur Foundation, the Frankfurt Zoological Society, the Wildlife Conservation Society, and the Marie Curie Transfer of Knowledge project BIORESC.

Adapted from materials provided by American Museum of Natural History, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/06/090601102021.htm

New 'Microcapsules' Put More Medication Into The Bloodstream To Treat Disease



Scientists report that new "microcapsules" could help the stomach absorb certain medicines. (Credit: The American Chemical Society)

ScienceDaily (June 1, 2009) — Scientists are reporting a potential solution to a problem that limits the human body's ability to absorb and use medications for heart disease, Type-2 diabetes, cancer and other conditions. It is a "nano-hybrid microcapsule" that enables the stomach to absorb more of these so-called "poorly-soluble" medicines.

Finding ways to improve the stomach's uptake of poorly soluble medicines has been one of the major challenges facing pharmaceutical companies. Estimates suggest, for instance, that 40 percent of potential new drugs fall into this category. In the new study, Clive Prestidge and colleagues note that one solution has been to include detergent-like substances in pills and capsules. However, that approach involves safety concerns, since the detergent can irritate the stomach lining, making it unsuitable for drugs that must be taken month after month.

The scientists describe development of a first-of-its-kind microcapsule made from lipid oils and nanoparticles 1/50,000th the width of a human hair. Although acting like conventional detergents, they seem unlikely to irritate the stomach. In test tube experiments, microcapsule versions of the arthritis drug, indomethacin, dissolved up to five times faster than a regular version of the drug. Lab rats given the new microcapsule version absorbed almost twice as much of the drug.

Journal reference:

1. Simovic et al. **Dry Hybrid Lipid−Silica Microcapsules Engineered from Submicron Lipid Droplets and Nanoparticles as a Novel Delivery System for Poorly Soluble Drugs**. *Molecular Pharmaceutics*, 2009; 6 (3): 861 DOI: 10.1021/mp900063t

Adapted from materials provided by American Chemical Society.

http://www.sciencedaily.com/releases/2009/06/090601091926.htm

Hearing, Voice Problems Worsen Seniors' Communication Skills

ScienceDaily (June 1, 2009) — Hearing and vocal problems go hand-in-hand among the elderly more frequently than previously thought, according to researchers at Duke University Medical Center. Together, they pack a devastating double punch on communication skills and overall well-being.

"It's important to realize these disabilities often occur concurrently," says Seth Cohen, MD, an otolaryngologist at the Duke Voice Care Center. "And when they do, they can increase the likelihood of depression and social isolation."

Nearly half of people age 65 and older have some degree of hearing loss, according to previously published reports, and about one-third of elderly adults have vocal problems including dysphonia, more commonly known as hoarseness. Taken apart, the disabilities have been linked in the elderly to increased depression, anxiety and social isolation.

In a study presented at the American Laryngological, Rhinological and Otological Society, (aka the Triological Society) in Phoenix, Cohen found that nearly 11 percent of the 248 participants with a median age of 82.4 had both disabilities. And, those respondents had greater depression scores.

While Cohen's study did not prove a direct cause and effect link between hearing loss and dysphonia, he says there appears to be a causal relationship.

"When people have trouble hearing, they strain their voices to hear themselves. Likewise, people may strain their voices if their communication partners can't hear." Because there is effective treatment for both hearing loss and dysphonia, he says it's important that people with one disability be evaluated for the other.

"We need to take a more global view of communication function in the elderly," he stresses.

Adapted from materials provided by Duke University Medical Center.

http://www.sciencedaily.com/releases/2009/05/090530172214.htm

Meteoroid Bombardment May Have Made Earth More Habitable, Says Study

Rendering of meteor falling to Earth. Large bombardments of meteoroids approximately four billion years ago could have helped to make the early Earth and Mars more habitable for life by modifying their atmospheres. (Credit: iStockphoto)

ScienceDaily (June 1, 2009) — Large bombardments of meteoroids approximately four billion years ago could have helped to make the early Earth and Mars more habitable for life by modifying their atmospheres, suggests the results of a new study.

When a meteoroid from space enters a planet's atmosphere, extreme heat causes some of the minerals and organic matter on its outer crust to be released as water and carbon dioxide (as a meteor burning up in the atmosphere) before it breaks up and hits the ground (and becomes a meteorite).

Researchers suggest the delivery of this water could have made Earth's and Mars' atmospheres wetter. The release of the greenhouse gas carbon dioxide could have trapped more energy from sunlight to make Earth and Mars warm enough to sustain liquid oceans.

In the new study, researchers from Imperial College London analysed the remaining mineral and organic content of fifteen fragments of ancient meteorites that had crashed around the world to see how much water vapour and carbon dioxide they would release when subjected to very high temperatures like those that they would experience upon entering the Earth's atmosphere.

The researchers used a new technique called pyrolysis-FTIR, which uses electricity to rapidly heat the fragments at a rate of 20,000 degrees Celsius per second, and they then measured the gases released.

They found that on average, each meteorite was capable of releasing up to 12 percent of the object's mass as water vapour and 6 percent of its mass as carbon dioxide when entering an atmosphere. They concluded that contributions from individual meteorites were small and were unlikely to have a significant impact on the atmospheres of planets on their own.

The researchers then analysed data from an ancient meteor shower called the Late Heavy Bombardment (LHB), which occurred 4 billion years ago, where millions of rocks crashed to Earth and Mars over a period of 20 million years.

Using published models of meteoritic impact rates during the LHB, the researchers calculated that 10 billion tonnes of carbon dioxide and 10 billion tonnes of water vapour could have been delivered to the atmospheres of Earth and Mars each year.

This suggests that the LHB could have delivered enough carbon dioxide and water vapour to turn the atmospheres of the two planets into warmer and wetter environments that were more habitable for life, say the researchers.

Professor Mark Sephton, from Imperial's Department of Earth Science and Engineering believes the study provides important clues about Earth's ancient past: "For a long time, scientists have been trying to understand why Earth is so water rich compared to other planets in our solar system. The LHB may provide a clue. This may have been a pivotal moment in our early history where Earth's gaseous envelope finally had enough of the right ingredients to nurture life on our planet."

Lead author of the study, Dr Richard Court from Imperial's Department of Earth Science and Engineering, adds: "Because of their chemistry, ancient meteorites have been suggested as a way of furnishing the early Earth with its liquid water. Now we have data that reveals just how much water and carbon dioxide was directly injected into the atmosphere by meteorites. These gases could have got to work immediately, boosting the water cycle and warming the planet."

However, researchers say Mars' good fortune did not last. Unlike Earth, Mars doesn't have a magnetic field to act as a protective shield from the Sun's solar wind. As a consequence, Mars was stripped of most of its atmosphere. A reduction in volcanic activity also cooled the planet. This caused its liquid oceans to retreat to the poles where they became ice.

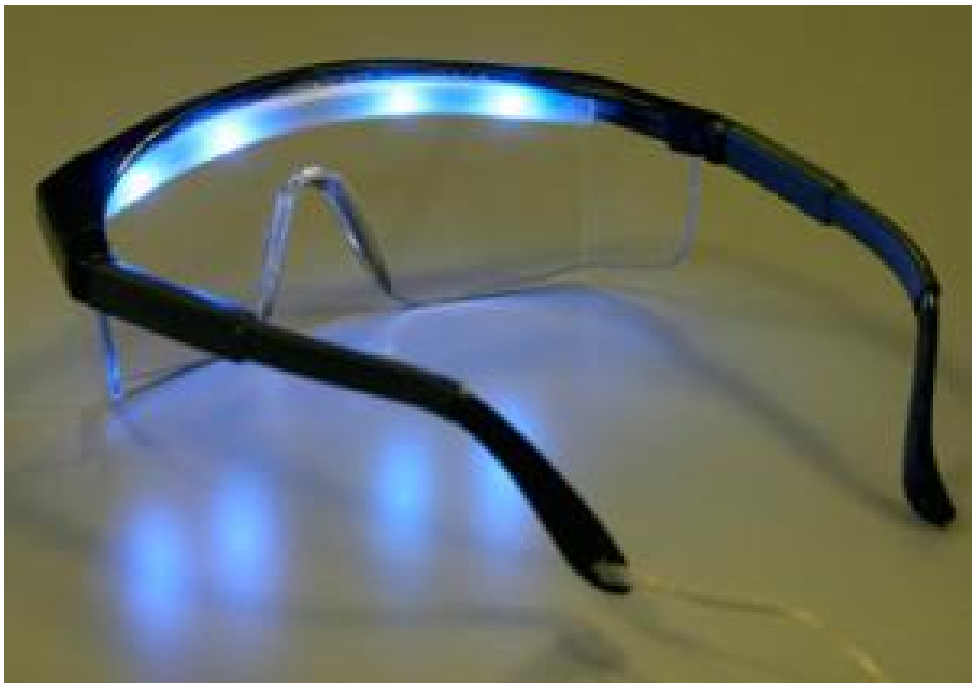
Journal reference:

1. Court et al. **Meteorite ablation products and their contribution to the atmospheres of terrestrial planets: An experimental study using pyrolysis-FTIR**. *Geochimica et Cosmochimica Acta*, 2009; 73 (11): 3512 DOI: 10.1016/j.gca.2009.03.006

Adapted from materials provided by Imperial College London.

http://www.sciencedaily.com/releases/2009/06/090601085930.htm

Light-treatment Device To Improve Sleep Quality In The Elderly



Researchers have developed a goggle-like device designed to deliver blue light directly to the eyes to improve sleep quality in older adults. (Credit: Image courtesy of Rensselaer Polytechnic Institute)

ScienceDaily (June 1, 2009) — Sleep disturbances increase as we age. Some studies report more than half of seniors 65 years of age or older suffer from chronic sleep disturbances. Researchers have long believed that the sleep disturbances common among the elderly often result from a disruption of the body's circadian rhythms — biological cycles that repeat approximately every 24 hours.In recent years, scientists at Rensselaer Polytechnic Institute's Lighting Research Center and elsewhere have demonstrated that blue light is the most effective at stimulating the circadian system when combined with the appropriate light intensity, spatial distribution, timing, and duration. A team at the Lighting Research Center (LRC) has tested a goggle-like device designed to deliver blue light directly to the eyes to improve sleep quality in older adults.

"Light and dark patterns are the major synchronizer of circadian rhythms to the 24-hour solar day," said Mariana Figueiro, Ph.D., Lighting Research Center Light and Health Program director and principal investigator on the project. "Light stimulus travels through the retina, the light-sensitive nerve tissue lining the back wall of the eye, to reach the master clock in the brain. However, a combination of age-related changes in the eye and a more sedentary lifestyle may reduce the amount of light stimulus reaching an older person's retina, therefore reducing the amount of light for the circadian system."

As we age, the lens in the eye thickens and the pupil shrinks, reducing the amount of light passing through to the retina. Making matters worse, in some cases, such as with persons with Alzheimer's disease, the circadian system may require a stronger light stimulus due to deteriorating neural processes in the brain. These physical and neural changes can lead to muted signals to the circadian system. Factor in environmental influences, such as an indoor lifestyle with less access to daylight, and you have a perfect scenario for the development of irregular sleep-activity patterns, according to Figueiro. The research team explains that a marked increase in daytime lighting levels can counteract the age-dependent losses in retinal light exposure by providing a stronger signal to the circadian system. However, the color and intensity of commercially available lighting systems, like those used in senior residences, assisted-living facilities, and nursing homes, are designed for visual effectiveness and minimal energy use and not necessarily efficacious for generating light to stimulate the older circadian system.

Commercially-available "white" light sources advertised to treat circadian-related sleep disorders are usually very bright light and can cause glare and compromise compliance.

In this project, the light-treatment prototype tested by Figueiro's team was developed by Topbulb.com, LLC, based on prior LRC light and health research. The device offers an alternative approach using specially designed goggles that deliver blue light spectrally tuned for optimum circadian response."The goal of this phase of the development project was to create a device in a smaller form factor or envelope that allowed for social inclusion and end-user mobility, while still delivering the required dose of light," said Topbulb.com Senior Developer Philip H. Bonello, Ph.D.

The device was worn by eleven subjects between the ages of 51 and 80 years of age. Each subject was exposed to two levels of blue light (about 50 lux and 10 lux) from the personal light-treatment device for 90 minutes on two separate nights. Blood and saliva samples were collected at prescribed times to assess levels of nocturnal melatonin, a hormone used as a marker for the circadian clock, with high levels at night when a person is in a dark environment and low levels during the day. After only one hour of light exposure, the light-induced nocturnal melatonin suppression level was about 35 percent for the low light level and about 60 percent for the high light level. In addition, the higher level of blue light suppressed nocturnal melatonin more quickly, to a greater extent over the course of the 90-minute exposure period, and was maintained after 60 minutes.

Having demonstrated its stimulation effect on the circadian system, the researchers believe the device could be subsequently used to increase sleep consolidation and efficiency in older subjects when worn for a prescribed duration at an appropriate time."The study suggests that the light goggles might be a practical, comfortable, and effective way to deliver light treatment to those suffering from circadian sleep disorders. The next steps are to conduct field studies where we will be testing the effectiveness of this personal light-treatment device on those suffering from circadian-related sleep disorders, while also verifying the acceptance of the a device among the test groups," said Figueiro.

Figueiro carried out her research with LRC scientists Andrew Bierman, John Bullough, Ph.D., and Mark Rea, Ph.D. They co-authored a paper detailing the study, "A Personal Light-Treatment Device for Improving Sleep Quality in the Elderly: Dynamics of Nocturnal Melatonin Suppression at Two Exposure Levels," which was recently published in Chronobiology International, Volume 26 Issue 4, 726.This study was supported by the National Institute on Aging (1R41AG029693) through a Small Business Technology Transfer grant to Topbulb.com, LLC, a commercial and residential resource for light bulbs.

Journal reference:

1. Figueiro et al. **A Personal Light-Treatment Device for Improving Sleep Quality in the Elderly: Dynamics of Nocturnal Melatonin Suppression at Two Exposure Levels**. *Chronobiology International*, 2009; 26 (4): 726 DOI: 10.1080/07420520902927809

Adapted from materials provided by Rensselaer Polytechnic Institute.

http://www.sciencedaily.com/releases/2009/05/090529112605.htm

The Coming Of Biofuels: Study Shows Reducing Gasoline Emissions Will Benefit Human Health

Assessments of the life cycle impacts of emissions from gasoline-run motors in the United States on a county-by-county basis show that the heaviest damage (darkest coloring) is concentrated in urban areas, especially Los Angeles, New York and Chicago. (Credit: Image courtesy of DOE/Lawrence Berkeley National Laboratory)

ScienceDaily (June 1, 2009) — When it comes to transportation fuels, carbon-neutral biofuels as an alternative to gasoline are coming. While the focus of a shift from gasoline to biofuels has been on global warming, such a shift could also impact human health.

A grant from the Energy Biosciences Institute (EBI) has produced a novel and comprehensive "Life Cycle Impact Assessment" to measure the benefits on human health that might result from a switch to biofuels. Although there are a number of uncertainties that must be addressed for a more accurate picture, these early results show that a biofuel eliminating even 10-percent of current gasoline pollutant emissions would have a substantial impact on human health in this country, especially in urban areas.

"While the successful deployment of biofuels requires research to overcome technical barriers, there are other barriers that can often impose constraints more challenging than those related to technical feasibility, including constraints imposed by health risks," says Thomas McKone, an expert on health risk assessments who holds a joint appointment with Berkeley Lab's Environmental Energy Technologies Division and the University of California Berkeley's School of Public Health. "Just think, if we had done a life cycle impact assessment on the human health effects of gasoline years ago we might not be in the situation we're facing today."

McKone is the co-leader of EBI's Life-Cycle Environmental and Economic Decision-Making for Alternative Biofuels programs with Arpad Horvath, an associate professor of civil and environmental engineering at UC Berkeley. At the recent 31st Symposium on Biotechnology for Fuels and Chemicals, conducted by the Society for Industrial Microbiology and held in San Francisco, he described a biofuels

Life Cycle Impact Assessment (LCIA) that he carried out in collaboration with Agnes Lobscheid, an environmental scientist who also holds joint appointments with Berkeley Lab and UC Berkeley."In a typical LCIA, we evaluate the potential impact on human health and the environment of a product or activity holistically, by analyzing those effects over the entire life cycle of the product or activity," McKone said in his presentation. "For biofuels, we will ultimately need to look at the overall human health and environmental impacts of biomass production, converting and processing this biomass into fuel, storing, transporting and distributing that fuel, and finally the actual combustion and use of the biofuel."

EBI is a partnership between UC Berkeley, Berkeley Lab, the University of Illinois and BP, the energy corporation that has provided EBI with a 10-year $500-million grant. Part of its mission is to look into the environmental, social and economic dimensions of a transition to biofuels for transportation energy. In their initial LCIA, McKone and Lobscheid wanted to gain a better understanding of both life-cycle impacts and the distribution in space and time of these impacts for reduced gasoline use. To do this they first needed to define the factors that really matter for characterizing such impacts.

"For example, when looking at greenhouse gas emissions the key is to determine the total amount of emissions being vented into the atmosphere," McKone said. "However, when looking at the release of toxic pollutants, where the pollutants are being released can be more important than how much or even how toxic."In preparing this LCIA on reduced gasoline use one of the biggest challenges faced by McKone and Lobscheid was the uncertainty factor in quantity, quality and relevance of their input data.

"Uncertainty was the elephant in the room for us," McKone said. "For an LCIA there are two types of uncertainties, those due to variability in measurements and models, and those due to lack of knowledge. In our case, the data is not what we would like and it will take years to improve it."Nonetheless, McKone and Lobscheid were able to prepare an LCIA for reduced gasoline use based on the damage to human health that emissions from gasoline burning can cause. For a baseline, they used a 10-percent reduction in gasoline use. In assessing the impact of these emissions on human health they looked at "disability adjusted life years or "DALYs," which is a combination of two common damage factors in LCIAs - years of life lost due to premature mortality (YLLs) and the equivalent years of life lost due to disability (YLDs). One DALY is equal to one lost year of "healthy" life. To put this into perspective, the total annual disease burden in the United States is about 30 million DALYs."In looking at emission impacts on health. we have the capacity to carry out county-level resolution measurements for both direct and indirect emissions," said McKone in his SIM symposium presentation.

Measured emissions at county-level resolution includeddirect particulate matter and indirect fine particles (2.5 micrometers in diameter or smaller) produced from emissions of sulfate and nitrite gases, volatile organic compounds and ammonia, plus ozone, toxic air pollutants, emissions to surface and ground water, and emissions to soil."We found that for the vehicle operation phase of our LCIA, the annual health damages avoided in the U.S. with 10-percent less gasoline-run motor vehicle emissions ranges from about 5,000 to 20,000 DALY, with most of the damage resulting from primary fine particle emissions," said McKone. "While county-specific damages range over nine orders of magnitude across all U.S. counties most of the damage, as you would expect, is concentrated in urban populations with the highest impact in the Los Angeles, New York and Chicago regions."Large urban regions also suffered disproportionate health damage as a result of benzene emissions at service stations and during the transporting by truck of gasoline to service stations - approximately 930 DALYs.

"We need finer spatial resolution about the impacts and more data on emissions factors, even for gasoline, to remove some of the key uncertainties about how fuel switching plays," said McKone, "but clearly impacts on human health should be a prime consideration in future fuel policy decisions."

Adapted from materials provided by DOE/Lawrence Berkeley National Laboratory.

http://www.sciencedaily.com/releases/2009/05/090528135250.htm

Parents' Influence On Children's Eating Habits Is Small, Study Finds

ScienceDaily (June 1, 2009) — The popular belief that healthy eating starts at home and that parents' dietary choices help children establish their nutritional beliefs and behaviors may need rethinking, according to a study by researchers at the Johns Hopkins Bloomberg School of Public Health. An examination of dietary intakes and patterns among U.S. families found that the resemblance between children's and their parents' eating habits is weak.The results are published in the May 25, 2009, issue of *Social Science and Medicine*.

"Child-parent dietary resemblance in the U.S. is relatively weak, and varies by nutrients and food groups and by the types of parent-child dyads and social demographic characteristics such as age, gender and family income," said Youfa Wang, MD, PhD, senior author of the study and associate professor with the Bloomberg School's Center for Human Nutrition. "When looking at overall diet quality, parent-child correlation in healthy eating index score was similar for both younger and older children. To our knowledge, this is the first such study that examined the similarities between children's and their parents' dietary intakes in the United States based on nationally representative data. Our findings indicate that factors other than family and parental eating behaviors may play an important role in affecting American children's dietary intakes."Researchers examined data from the U.S. Department of Agriculture (USDA) Continuing Survey of Food Intakes by Individuals, a nationally representative multi-stage sample of 16,103 people containing information about dietary intake, socioeconomic, demographic and health parameters surveyed from 1994 to 1996. Average dietary intake and dietary quality indicators were assessed using two 24-hour dietary recalls provided by study participants. Researchers also assessed the overall quality of the participating children's and their parents' diets based on the USDA 2005 Health Eating Index (HEI) along with a number of other covariates. They found that the correlations between children's and their parents' HEI scores ranged from 0.26 to 0.29 across various child-parent dyads such as mother-daughter and father-son; for total energy intake they were 0.14 to 0.29, and for fat intake, -0.04 to 0.28. The range of the correlation measure is between -1 and 1, while 0 means no resemblance and 1 indicates a perfect resemblance. The researchers also found some differences in the resemblance between different types of child-parent dyads and nutrient intakes, and by children's age and family income."Factors other than parental eating behaviors such as community and school, food environment, peer influence, television viewing, as well as individual factors such as self-image and self-esteem seem to play an important role in young people's dietary intake," said May A. Beydoun, PhD, co-author of the study and a former postdoctoral research fellow at the Bloomberg School."Our findings have a number of important public health implications. In particular, the overall weak to moderate parent-child resemblance in food groups, nutrients and healthy eating index scores suggest that interventions targeting parents could have only a moderate effect on improving their children's diet. Nevertheless, based on our findings stratified by population groups, for interventions targeting parents, those would be more effective when targeted at mothers, minority groups, and as early as possible in childhood. We suspect that the child-parent resemblance in dietary intake may have become weaker over time, due to the growing influence of other factors outside of the family," said Wang.

"Parent-child dietary intake resemblance in the United States: Evidence from a large representative survey" was written by May A. Beydoun and Youfa Wang.The research was supported in part by the National Institutes of Health, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the U.S. Department of Agriculture, and the Johns Hopkins Center for a Livable Future.

1. May A. Beydoun, Youfa Wang. **Parent–child dietary intake resemblance in the United States: Evidence from a large representative survey**. *Social Science & Medicine*, 2009; DOI: 10.1016/j.socscimed.2009.03.029

Adapted from materials provided by Johns Hopkins University Bloomberg School of Public Health, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090529121550.htm

Significant Gas Resource Discovered In Gulf Of Mexico

Gas hydrates are relatively abundant in sea-floor mounds on the Gulf of Mexico. Here methane is actively dissociating from a hydrate mound. (Credit: Courtesy of USGS)

ScienceDaily (June 1, 2009) — The Gulf of Mexico contains very thick and concentrated gas-hydrate-bearing reservoir rocks which have the potential to produce gas using current technology.

Recent drilling by a government and industry consortium confirm that the Gulf of Mexico is the first offshore area in the United States with enough information to identify gas hydrate energy resource targets with potential for gas production.

Gas hydrate, a substance comprised of natural gas and water, is thought to exist in great abundance in nature and has the potential to be a significant new energy source to meet future energy needs. However, prior to this expedition, there was little documentation that gas hydrate occurred in resource-quality accumulations in the marine environment.

"This is an exciting discovery because for the first time in the U.S. Gulf of Mexico, we were able to predict hydrate accumulations before drilling, and we discovered thick, gas hydrate-saturated sands that actually represent energy targets," said U.S. Geological Survey Energy Program Coordinator Brenda Pierce.

The U.S. Department of Energy (DOE), the U.S. Geological Survey (USGS), U.S. Minerals Management Service (MMS) and a group of U.S. and international energy industry companies under the management of Chevron were responsible for conducting this first ever drilling project with the goal to collect geologic data on gas-hydrate-bearing sand reservoirs in the Gulf of Mexico.

"We have also found gas hydrate in a range of settings, including sand reservoirs, thick sequences of fracture-filling gas hydrates in shales, and potential partially saturated gas hydrates in younger systems," said USGS Scientist Timothy Collett. "These sites should provide a wealth of opportunities for further study and data collection that should provide significant advances in understanding the nature and development of gas hydrate systems."

The most important technical accomplishments include:

- The collection of a comprehensive set of logging-while-drilling (LWD) data through expected hydrate-bearing sand reservoirs in seven wells at three locations in the Gulf of Mexico.
- LWD sensors provided unprecedented information on the nature of the sediments and the occurrence of gas hydrate.
- The expedition discovered gas hydrate in both sand and fracture dominated reservoirs.
- The discovery of thick gas-hydrate-bearing sands validates the pre-drilling integrated geological and geophysical approach used to identify the targets and provides increased confidence in assessing the energy resource potential of marine gas hydrates.
- In the case of the Walker Ridge and Green Canyon drill sites gas-hydrate-bearing sand reservoirs between 50 and 100 ft thick were discovered.
- The discovery of concentrated gas hydrates in sand reservoirs has made Walker Ridge and Green Canyon prime locations for future research drilling, coring, and production testing.

Field operations during this expedition were also supported by AOA Geophysics, the Borehole Research Group at Lamont-Doherty Earth Observatory of Columbia University, Schlumberger, and the crew of the Helix Q4000 drilling vessel.

Adapted from materials provided by USGS.

http://www.sciencedaily.com/releases/2009/05/090531100819.htm

Regular Light Bulbs Made Super-efficient With Ultra-fast Laser

A new laser technology could make a light as bright as a 100-watt bulb consume less electricity than a 60-watt bulb while remaining far cheaper and radiating a more pleasant light than a fluorescent bulb can. (Credit: iStockphoto)

ScienceDaily (June 1, 2009) — An ultra-powerful laser can turn regular incandescent light bulbs into power-sippers, say optics researchers at the University of Rochester. The process could make a light as bright as a 100-watt bulb consume less electricity than a 60-watt bulb while remaining far cheaper and radiating a more pleasant light than a fluorescent bulb can.

The laser process creates a unique array of nano- and micro-scale structures on the surface of a regular tungsten filament—the tiny wire inside a light bulb—and theses structures make the tungsten become far more effective at radiating light.

The findings will be published in an upcoming issue of the journal *Physical Review Letters*.

"We've been experimenting with the way ultra-fast lasers change metals, and we wondered what would happen if we trained the laser on a filament," says Chunlei Guo, associate professor of optics at the University of Rochester. "We fired the laser beam right through the glass of the bulb and altered a small area on the filament. When we lit the bulb, we could actually see this one patch was clearly brighter than the rest of the filament, but there was no change in the bulb's energy usage."

The key to creating the super-filament is an ultra-brief, ultra-intense beam of light called a femtosecond laser pulse. The laser burst lasts only a few quadrillionths of a second. To get a grasp of that kind of speed, consider that a femtosecond is to a second what a second is to about 32 million years. During its brief burst, Guo's laser unleashes as much power as the entire grid of North America onto a spot the size of a needle point. That intense blast forces the surface of the metal to form nanostructures and microstructures that dramatically alter how efficiently can radiate from the filament.

In 2006, Guo and his assistant, Anatoliy Vorobeyv, used a similar laser process to turn any metal pitch black. The surface structures created on the metal were incredibly effective at capturing incoming radiation, such as light.

"There is a very interesting 'take more, give more' law in nature governing the amount of light going in and coming out of a material," says Guo. Since the black metal was extremely good at absorbing light, he and Vorobyev set out to study the reverse process—that the blackened filament would radiate light more effectively as well.

"We knew it should work in theory," says Guo, "but we were still surprised when we turned up the power on this bulb and saw just how much brighter the processed spot was."

In addition to increasing the brightness of a bulb, Guo's process can be used to tune the color of the light as well. In 2008, his team used a similar process to change the color of nearly any metal to blue, golden, and gray, in addition to the black he'd already accomplished. Guo and Vorobeyv used that knowledge of how to control the size and shape of the nanostructures—and thus what colors of light those structures absorb and radiate—to change the amount of each wavelength of light the tungsten filament radiates. Though Guo cannot yet make a simple bulb shine pure blue, for instance, he can change the overall radiated spectrum so that the tungsten, which normally radiates a yellowish light, could radiate a more purely white light.

Guo's team has even been able to make a filament radiate partially polarized light, which until now has been impossible to do without special filters that reduce the bulb's efficiency. By creating nanostructures in tight, parallel rows, some light that emits from the filament becomes polarized.

The team is now working to discover what other aspects of a common light bulb they might be able to control. Fortunately, despite the incredible intensity involved, the femtosecond laser can be powered by a simple wall outlet, meaning that when the process is refined, implementing it to augment regular light bulbs should be relatively simple.

Guo is also announcing this month in *Applied Physics Letters* a technique using a similar femtosecond laser process to make a piece of metal automatically move liquid around its surface, even lifting a liquid up against gravity.

This research was supported by the U.S. Air Force Office of Scientific Research.

Journal reference:

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Adapted from materials provided by University of Rochester.

http://www.sciencedaily.com/releases/2009/05/090529121556.htm

Obese Women Should Not Gain Weight During Pregnancy, Study Suggests

ScienceDaily (June 1, 2009) — For years, doctors and other health-care providers have managed pregnant patients according to guidelines issued by the American College of Obstetricians and Gynecologists (ACOG). In 1986, ACOG stated, "Regardless of how much women weigh before they become pregnant, gaining between 26-35 pounds during pregnancy can improve the outcome of pregnancy and reduce their chances of having the pregnancy end in fetal death." Until its revised guidelines were released yesterday, the Institute of Medicine (IOM) had recommended that overweight women should gain about 15 pounds during pregnancy.

The current study was undertaken to test whether these guidelines make a difference in maternal-fetal outcomes among obese women. In the study, conducted at several hospitals, the researchers followed 232 obese pregnant women, all of whom had a body mass index (BMI) of 30 or greater. Half of the women followed conventional prenatal nutritional guidelines, which is essentially "eat to appetite" (control group). The other half were placed on a well-balanced, nutritionally monitored program, which included a daily food diary (study group). The average weight gain in the control group was 31 pounds, compared to 11 pounds in the study group. Twenty-three extremely obese patients lost weight during their pregnancy.

The findings showed that there were no fetal deaths and no growth-restricted infants in the study group. Also, there were fewer babies weighing more than 10 pounds in the study group than in the control group. (A birth weight over 10 pounds poses significant hazards to both infants and mothers.) Moreover, women in the study group gained less weight, had fewer cesarean deliveries, were less likely to develop gestational diabetes, and retained less weight after they delivered than women in the control group.

The researchers concluded that obese pregnant women may be placed on a healthy, well balanced, monitored nutritional program without adverse maternal-fetal outcomes.

"Women who are obese when beginning a pregnancy are, by definition, unhealthy," says study leader Yvonne S. Thornton, MD, MPH, a clinical professor of obstetrics and gynecology and board-certified specialist in maternal-fetal medicine at New York Medical College. "To say that they should gain even more weight is counter-intuitive, and our study bears that out. Rather than focusing on numerical endpoints with respect to weight gain, we need to focus on making these women healthier by getting them to eat a well-balanced diet."

The study grew out of Dr. Thornton's personal experience with obesity and pregnancy. Despite being overweight, she gained a substantial amount of weight during her first pregnancy, exacerbating her life-long battle with obesity. During her second pregnancy, she followed a well-balanced diet and gained little weight, with no adverse consequences for mother or baby.

Dr. Thornton observed the same pattern in her own clinical practice, leading her to question prevailing guidelines for weight gain during pregnancy. Adding to her skepticism was the fact that women who develop gestational diabetes are routinely put on diets that effectively limit weight gain, with no ill effects.

"It is the mindset of our specialty, and our society, that we need to have round, chubby pregnant women in order make sure they are healthy," adds Dr. Thornton. "Pregnancy has become a license to eat. We talk about 'eating for two,' but it's really more like eating for 1 and 1/20th."

These attitudes have contributed to the obesity epidemic in the U.S., where 35 percent of women are considered obese, says the researcher. The situation is even worse among African-American women, four out of five of whom are overweight or obese.

"Gaining weight during pregnancy contributes to obesity, and it makes it that much harder for overweight women to return to their normal weight after pregnancy," says Dr. Thornton.

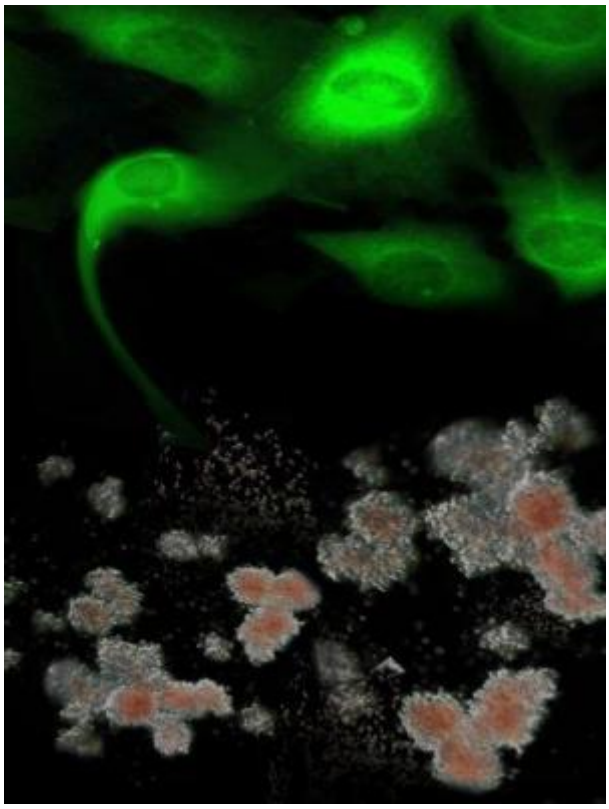
The IOM and the National Research Council (NRC) have undertaken a study to review and update the 1990 IOM recommendations for weight gain during pregnancy. The IOM-NRC findings, which support the findings in Dr. Thornton's study, were released May 28.

Dr. Thornton's paper, "Perinatal Outcomes in Nutritionally Monitored Obese Pregnant Women: A Randomized Clinical Trial," was published in the June issue of the *Journal of the National Medical Association*. Her co-authors include Claudia Smarkola, PhD, Sharon M. Kopacz, MD, and Sabriya B. Ishoof, MD.

Adapted from materials provided by New York Medical College, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/05/090529121552.htm

Combined Stem Cell-Gene Therapy Approach Cures Human Genetic Disease In Vitro



Shown in green are genetically-corrected fibroblasts from Fanconi anemia patients are reprogrammed to generate induced pluripotent stem cells, which, in turn, can be differentiated into disease-free hematopoietic progenitors, capable of producing blood cells in vitro. (Credit: Courtesy of Dr. Juan-Carlos Belmonte, Salk Institute for Biological Studies)

ScienceDaily (June 1, 2009) — A study led by researchers at the Salk Institute for Biological Studies, has catapulted the field of regenerative medicine significantly forward, proving in principle that a human genetic disease can be cured using a combination of gene therapy and induced pluripotent stem (iPS) cell technology. The study is a major milestone on the path from the laboratory to the clinic.

"It's been ten years since human stem cells were first cultured in a Petri dish," says the study's leader Juan-Carlos Izpisúa Belmonte, Ph.D., a professor in the Gene Expression Laboratory and director of the Center of Regenerative Medicine in Barcelona (CMRB), Spain. "The hope in the field has always been that we'll be able to correct a disease genetically and then make iPS cells that differentiate into the type of tissue where the disease is manifested and bring it to clinic."

Although several studies have demonstrated the efficacy of the approach in mice, its feasibility in humans had not been established. The Salk study offers the first proof that this technology can work in human cells.

Belmonte's team, working with Salk colleague Inder Verma, Ph.D., a professor in the Laboratory of Genetics, and colleagues at the CMRB, and the CIEMAT in Madrid, Spain, decided to focus on Fanconi anemia (FA), a genetic disorder responsible for a series of hematological abnormalities that impair the body's ability to fight infection, deliver oxygen, and clot blood. Caused by mutations in one of 13 Fanconi anemia (FA) genes, the disease often leads to bone marrow failure, leukemia, and other cancers. Even after receiving bone marrow transplants to correct the hematological problems, patients remain at high risk of developing cancer and other serious health conditions.

After taking hair or skin cells from patients with Fanconi anemia, the investigators corrected the defective gene in the patients' cells using gene therapy techniques pioneered in Verma's laboratory. They then successfully reprogrammed the repaired cells into induced pluripotent stem (iPS) cells using a combination of transcription factors, OCT4, SOX2, KLF4 and cMYC. The resulting FA-iPS cells were indistinguishable from human embryonic stem cells and iPS cells generated from healthy donors.

Since bone marrow failure as a result of the progressive decline in the numbers of functional hematopoietic stem cells is the most prominent feature of Fanconi anemia, the researchers then tested whether patient-specific iPS cells could be used as a source for transplantable hematopoietic stem cells. They found that FA-iPS cells readily differentiated into hematopoietic progenitor cells primed to differentiate into healthy blood cells.

"We haven't cured a human being, but we have cured a cell," Belmonte explains. "In theory we could transplant it into a human and cure the disease."

Although hurdles still loom before that theory can become practice—in particular, preventing the reprogrammed cells from inducing tumors—in coming months Belmonte and Verma will be exploring ways to overcome that and other obstacles. In April 2009, they received a $6.6 million from the California Institute Regenerative Medicine (CIRM) to pursue research aimed at translating basic science into clinical cures.

"If we can demonstrate that a combined iPS–gene therapy approach works in humans, then there is no limit to what we can do," says Verma.

Researchers who also contributed to the work include first author Ángel Raya, as well as Ignasi Rodríguez-Pizà, Rita Vassena, María José Barrero, Antonella Consiglio, Eduard Sleep, Federico González, Gustavo Tiscornia, Elena Garreta, Trond Aasen, and Anna Veiga of the Center for Regenerative Medicine in Barcelona, Spain; Guillermo Guenechea, Susana Navarro, Paula Río, and Juan Bueren of the Hematopoiesis and Gene Therapy Division, Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas in Madrid, Spain; and Maria Castellà and Jordi Surrallés of the Department of Genetics and Microbiology, Universitat Autonoma de Barcelona.

Journal reference:

1. Ángel Raya, Ignasi Rodríguez-Pizà, Guillermo Guenechea, Rita Vassena, Susana Navarro, María José Barrero, Antonella Consiglio, Maria Castellà, Paula Río, Eduard Sleep, Federico González, Gustavo Tiscornia, Elena Garreta, Trond Aasen, Anna Veiga, Inder M. Verma, Jordi Surrallés, Juan Bueren & Juan Carlos Izpisúa Belmonte. **Disease-corrected haematopoietic progenitors from Fanconi anaemia induced pluripotent stem cells**. *Nature*, May 31, 2009 DOI: 10.1038/nature08129

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http://www.sciencedaily.com/releases/2009/05/090531141321.htm

Women Bridging Gap in Science Opportunities

By CORNELIA DEAN

The prospects for women who are scientists and engineers at major research universities have improved, although women continue to face inequalities in salary and access to some other resources, a panel of the National Research Council concludes in a new report.

In recent years "men and women faculty in science, engineering and mathematics have enjoyed comparable opportunities," the panel said in its report, released on Tuesday. It found that women who apply for university jobs and, once they have them, for promotion and tenure, are at least as likely to succeed as men. But compared with their numbers among new Ph.D.'s, women are still underrepresented in applicant pools, a puzzle that offers an opportunity for further research, the panel said.
The panel said one factor outshined all others in encouraging women to apply for jobs: having women on the committees appointed to fill them.
In another report this week in the Proceedings of the National Academy of Sciences, researchers at the University of Wisconsin reviewed a variety of studies and concluded that the achievement gap between boys and girls in mathematics performance had narrowed to the vanishing point.
"U.S. girls have now reached parity with boys, even in high school and even for measures requiring complex problem solving," the Wisconsin researchers said. Although girls are still underrepresented in the ranks of young math prodigies, they said, that gap is narrowing, which undermines claims that a greater prevalence of profound mathematical talent in males is biologically determined. The researchers said this and other phenomena "provide abundant evidence for the impact of sociocultural and other environmental factors on the development of mathematical skills and talent and the size, if any, of math gender gaps."
The research council, an arm of the National Academy of Sciences, convened its expert panel at the request of Congress. The panel surveyed six disciplines — biology, chemistry, mathematics, civil and electrical engineering and physics — and based its analysis on interviews with faculty members at 89 institutions and data from federal agencies, professional societies and other sources.
The panel was led by Claude Canizares, a physicist who is vice president for research at M.I.T., and Dr. Sally Shaywitz of Yale Medical School, an expert on learning.
The Wisconsin researchers, Janet S. Hyde and Janet E. Mertz, studied data from 10 states collected in tests mandated by the No Child Left Behind legislation as well as data from the National Assessment of Educational Progress, a federal testing program. Differences between girls' and boys' performance in the 10 states were "close to zero in all grades," they said, even in high schools were gaps existed earlier. In the national assessment, they said, differences between girls' and boys' performance were "trivial."

http://www.nytimes.com/2009/06/03/science/03discrim.html?ref=science

Wisdom in a Cleric's Garb; Why Not a Lab Coat Too?

By DENNIS OVERBYE

There is a warm fuzzy moment near the end of the movie "Angels & Demons," starring Tom Hanks and directed by Ron Howard.

Mr. Hanks as the Harvard symbologist Robert Langdon has just exposed the archvillain who was threatening to blow up the Vatican with antimatter stolen from a particle collider. A Catholic cardinal who has been giving him a hard time all through the movie and has suddenly turned twinkly-eyed says a small prayer thanking God for sending someone to save them.
Mr. Hanks replies that he doesn't think he was "sent."
Of course he was, he just doesn't know it, the priest says gently. Mr. Hanks, taken aback, smiles in his classic sheepish way. Suddenly he is not so sure.
This may seem like a happy ending. Faith and science reconciled or at least holding their fire in the face of mystery. But for me that moment ruined what had otherwise been a pleasant two hours on a rainy afternoon. It crystallized what is wrong with the entire way that popular culture regards science. Scientists and academics are smart, but religious leaders are wise.
These smart alecks who know how to split atoms and splice genes need to be put in their place by older steadier hands.
It was as if the priest had patted Einstein on the head and chuckled, "Never mind, Sonny, some day you'll understand."
"Angels & Demons," a prequel to "The DaVinci Code," also directed by Mr. Howard and starring Mr. Hanks, and based on a mega-selling book by Dan Brown, opened at No. 1 at the box office in May despite lackluster reviews, and is still doing respectably.
It's not likely that all those people flocked into the theaters to ponder the relationship between science and religion. "Angels" is a "24"-style thriller, in which Mr. Hanks and his fellow traveler, a biophysicist played by Ayelet Zurer, race the clock following clues left around Rome by the Renaissance artist and sculptor Bernini to find out who is killing a group of cardinals and has vowed to blow up the Vatican.
The new movie has torture, gorgeous cinematography, including cool shots of the collider firing up, bizarre plot twists and turns, and, like the earlier movie, Mr. Hanks dashing into the library (in this case the fabled Vatican archives) at crucial moments to retrieve and decode in a few ticking minutes some long-lost document.
But it is the ages-old conflict between science and religion that supplies the framework for all this action. Since the early 17th century, the story goes, a secret network of scientists and skeptics known as the Illuminati, who have included Galileo and Bernini, have been engaged in an underground war against the church.

My first response upon reading the book earlier this year was to wonder if any part of this history could be true. I was disappointed but not particularly surprised to find that the short answer is no. Mr. Brown is so successful at spinning his fables that a whole industry has grown up around debunking him.
There was indeed an organization called the Illuminati formed in Bavaria in 1776 — too late for Galileo or Bernini — but according to historians it died out a decade or so later. Nevertheless the Illuminati have lived on in the imaginations of conspiracy theorists.
For Mr. Howard, who has been lauded for getting things right in movies like "Apollo 13" and "A Beautiful Mind," the vagueness between what is real history and what is made up in Dan Brown's books is part of the fun. "He doesn't invent things, he creates suppositions," Mr. Howard said.
The church did burn Giordano Bruno at the stake for various heresies, including espousing the Copernican sun-centric view of the solar system, in 1600, and sentenced Galileo to permanent house arrest as "violently suspect of heresy," in 1633. But in recent times Catholics have gotten better about science, especially compared with some of their fundamentalist cousins in the United States. The church has been cool with the Big Bang origin of the universe since 1951, and the current pope, Benedict, has signaled his acceptance of evolution, at least as an explanation of how humankind came about, if not why.
In a recent interview, Mr. Howard said that he didn't think there was any conflict between science and religion. Both are after big mysteries, but whatever science finds, he said, "There's still going be that question: 'And before that?' "
I don't really mind that the movie and book have rewritten history, and the movie takes fewer liberties with science than much science fiction.
But I can't help being bugged by that warm, fuzzy moment at the end, that figurative pat on the head. After all is said and done, it seems to imply, having faith is just a little bit better than being smart.
Maybe I am making too much of this cinematic grain of sand to see the whole history of science and religion in it. But I have a feeling the scene wouldn't work if the boyish Mr. Hanks were replaced by someone more formidable, say, Frank Langella or Clint Eastwood or Humphrey Bogart.
Part of what gives the movie its kick is the old Henry Jamesian notion of a headstrong American encountering old European tradition. We're still in awe of all that tradition, even as we insist, like teenagers exclaiming that Dad is an out-of-it old fogey, that it's a new world.
And they are still patting us on the head. Why should wisdom and comfort inhabit a clerical collar instead of a lab coat? Perhaps because religion seems to offer consolations that science doesn't.
The late physicist John Archibald Wheeler once said that what gives great leaders power is the ability to comfort others in the face of death. But the iconic achievement of modern physics is the atomic bomb, death incarnate.
Moreover, since the time of Galileo scientists have bent over backward to restrain their own metaphysical rhetoric for fear of stepping on religious toes. Indeed, many of them were devout believers convinced they were exploring the mind of God. Stephen Jay Gould, the late paleontologist and author, famously referred to science and religion as "non-overlapping magisteria."
The lament, voiced often in the movie and even more in the book, is that science, with its endlessly nibbling doubts, has drained the world of wonder and meaning, depriving humans of, among other things, a moral compass.The church advertises strength through certitude, but starting from the same collection of fables, commandments and aphorisms — love thy neighbor; thou shalt not kill; blessed are the meek for they will inherit the Earth — the religions of the world have reached an alarmingly diverse set of conclusions about what behaviors, like gay marriage, are right and wrong.
If science drains the world of certainty, maybe that is invigorating as well as appropriate. The cardinal is free to revel in the assurance of his absolutes, while Tom Hanks and I can be braced by the challenge of being our own cosmologists, creating our own meanings.
Meanwhile, America is not so young and innocent anymore, and science has its own traditions and, yes, wisdoms, stretching back to antiquity.
In science the ends are justified by the means — what questions we ask and how we ask them — and the meaning of the quest is derived not from answers but from the process by which they are found: curiosity, doubt, humility, tolerance.Those fatherly pats on the head sound comforting, but as an answer to life's struggles and quests, they lack something.
I miss my dad, but I'm glad I stood my ground and kept flailing at a writing career when he wanted to rescue me and set me up in a family business. Mr. Hanks should hold his ground too.

http://www.nytimes.com/2009/06/02/science/02essay.html?ref=science

VIKTOR DEAK
Where Art and Paleontology Intersect, Fossils Become Faces

By DONALD G. McNEIL Jr.

For his first date with a fellow art student, Viktor Deak suggested "Bodies," the exhibit of flayed and plasticized humans.

She said yes, even though she had already seen it. He thought that was promising. But it was dinner afterward that convinced him this was the real thing.
"Any woman who could go to 'Bodies' with me and then eat a steak," he said, "and still be dainty and fun and all, was a girl I could be with forever."

Mr. Deak (pronounced DAY-ahk) and Xochitl Gomez were married at the Bronx Zoo, in the gorilla grotto. Which makes sense, given how much time they spend there. He brings the camera, she totes the big looking glass.

"They know it's a mirror," he said of the zoo's gorilla family. "They come up, make faces, check out their teeth. I've gotten some really great shots."

His interest in gorilla grimaces, like his interest in displays of dissected flesh, is professional. Mr. Deak, 32, is one of the world's leading paleoartists. If you find yourself face to face in a museum with Homo habilis, Australopithecus afarensis or Paranthropus boisei, you may be looking at his work.
Many of the images of hominids in the new Hall of Human Origins at the American Museum of Natural History are his, as are those in the book "The Last Human," both of which he did in collaboration with Gary J. Sawyer, the museum's physical anthropologist.

(Much of Mr. Deak's work can be seen on his Web site, www.anatomicalorigins.com.)
His 78-foot-long mural showing six million years' worth of the proto-humans whose bony bits have been found in northeast Africa is coming to Manhattan in June as part of the exhibit "Lucy's Legacy." The exhibit's centerpiece is the fossilized skeleton of Lucy — three million years old, less than four feet tall, hailing from the Afar Depression of Ethiopia and named after the Beatles song "Lucy in the Sky With Diamonds," which was playing in the camp when she was found in 1974.
But his mural, a vast Photoshop collage, is more fun to ponder than the bones. The background uses thousands of his photos of vegetation, rocks, valleys and outcrops from the South Dakota badlands, the Puerto Rican jungle and the Wyoming prairie. Only one speck of it, a friend's mother's safari shot of

faraway thorn trees, was actually snapped in Africa. But Ethiopia today, of course, no longer has the lush rainforest and grassy savannah of Ethiopia three million years ago, so Mr. Deak had to improvise. His landscape is filled with ape-men morphed from photos of his sculpted heads overlaid with photos of chimpanzee hair like a late-night hair restoration commercial, each one set atop the body of a human — usually Mr. Deak, his wife, or friends — in a primeval pose, then further adjusted to have longer arms, jutting buttocks or whatever is accurate.
You do not want to be alone in his apartment at night. His shelves have more skulls than a heavy metal album cover, some of them only partly defleshed. Even his little pasta machine is creepy. He uses it to extrude red clay at just the right thickness for face muscles.

There is something lost in time about the place. Maybe it's the lack of artifacts from any time zone between his fossil racks and his Transformer robot collection.

It's not just that as an artist, Mr. Deak has little patience for contemporary art. It's that he disapproves of pretty much everything from the last 100,000 years, the entire Homo sapiens canon.
After all, he says, not only did our immediate ancestors wipe out many big mammals, but they probably killed off and ate some of his favorite objets d'art, including Homo neanderthalensis, erectus and floresiensis.

"Is it any wonder we have a hard time hanging out with our neighbors," he asks rhetorically after a long discourse on extinctions, "when at one time we went through the whole planet and just cleaned house?"
Mr. Deak is in touch with his inner hominid. His bodybuilding hobby — the dumbbells are on his studio floor — gives him that "don't mess with me" look sought by all male primates, and he does a mean "Nutcracker Man with a rock" pose from his own mural.

But the threatening mien is belied by his personality, which is both scholarly and a little star-struck. He is in awe of the early paleoartist John Gurche and the novelist and former New York Times reporter John Darnton, whose book "Neanderthal" he carries everywhere, wrapped in plastic.

"I was a strange little kid," he answers when asked how he got into paleoart. One of his first sculptures was done at a family barbecue, a human skeleton from chicken bones. Other defining moments, he said, included a book of dinosaur illustrations his Budapest grandfather bought for him, seeing Luke Skywalker get a robotic hand and watching an eighth-grade science film of Mr. Gurche playing Pygmalion to a fossil skull. (Mr. Deak was born in Hungary but grew up in Connecticut.)

His big break came when he was a School of Visual Arts student sketching in the natural history museum. A staff member saw his work and introduced him to Mr. Sawyer.

"I could tell he could think three-dimensionally, abstractly and symbolically," Mr. Sawyer, whom Mr. Deak refers to as his "spiritual mother," said in a telephone interview. "That's the kind of student I wanted to work with."

At his urging, Mr. Deak went to SUNY Downstate Medical School to dissect cadavers.
"I remember one time he called me, his hands were full of guck, and he said, 'This is fantastic!' " Mr. Sawyer said.

Both recall one of Mr. Deak's early efforts at Homo heidelbergensis. After weeks of work, he showed it to Mr. Sawyer, who studied it silently, then snatched up a scalpel and began stabbing the nose.
"I almost tackled him," Mr. Deak said. "Then he said, 'The nose is wrong. Do it again.' It's maybe not the way I'd teach a student, but he taught me that no work is sacred, you have to be ready to destroy it."
Mr. Sawyer didn't dispute either the event or the point.

"Viktor didn't have that deep, deep background in anatomy he does now," he said. "He's evolved."
Hazings like that proved a blessing because, in paleontology, photorealism has its nitpickers. Picasso never had to explain that his mistresses weren't actually cubic, but Mr. Deak has taken grief over as little as a flexed knee. One academic critic who saw his Lucy mural publicly boasted that he himself "had the

good fortune to examine Lucy when she was in Donald C. Johanson's lab in Cleveland, and I can assure you that the anatomy of the lower back, hips, feet and knee and ankle joints all provide clear evidence that those early hominids stood just as erect as we do."

Mr. Deak replied on the same Web site that he knew perfectly well that Lucy could stand up, but he had depicted her crouching because she was pulling away from a predator — the viewer. She was, he explained, protecting the baby in her arms and about to run off.

To prove his point, he picks up a cast of her skull. The angle of the foramen magnum, the hole where the spine enters the vault, he explains, shows that she could stand erect.

Anatomical decisions aside, there were other advantages to hunching Lucy over, turning her sideways and adding a baby. Besides the added tension, it avoided the distracting Playboy Primate Playmate aspect of his early drafts, which showed Lucy in full-frontal fecundity. Unlike Homo idaltu, a homo sapiens subspecies extinct for a mere 150,000 years who is also in the mural and who sports a spear and a fetching loincloth, Lucy bipedally strode the earth before clothes were invented.

But the real controversy, Mr. Deak said, is in the idea his work represents. When he was waiting tables as a student, he served a family that had just visited the natural history museum. When he said he worked there part time, they were excited — until he said he worked on the Hall of Human Origins.
"They said, 'Shh, please — don't say anything around the kids,' " he said. " 'We believe in a young Earth. We teach our children that we're made directly in God's image, and the Earth is about 5,000 years old.' "

"Well, did you see the dinosaurs?" he asked.

" 'Yes. We tell them these are the creatures that didn't make it to the Ark.' "

"I felt a chill of fear," Mr. Deak said. "I still do when I think about it. I've seen, sometimes firsthand, the evidence that came out of the ground. It's terrifying that people can look at it and say, 'It's not there' and believe in something that was just dictated to them."
"But," he added, "I was a waiter. I wanted a tip. I bit my tongue and just got out of there."

http://www.nytimes.com/2009/06/02/science/02prof.html?ref=science

In Talks With a Dying Patient, Affirming Life

By RUTH H. LIVINGSTON

"Talk, just talk," she says, her voice a whisper, her body contorting as she braces for the next onslaught of pain.

As a psychoanalyst, I am the one who usually utters these words to my patients — not the other way around. Still, I begin. Awkwardly, haltingly, I speak of mundane events of my day: my challenging subway trip to her home, my feelings about the hot weather, how my husband and I spent our weekend.

I feel strange, out of role and incredibly selfish. How can I be yattering on about my life when she is clearly dying?

Yet as I speak, she smiles. The furrows of pain creasing her forehead relax. "Please don't stop," she rasps.

And so I go on. But more than telling her about my life, I most often talk about what I know of hers — about what she is going through and what it may mean to her and everyone around her.

Often we talk of her death: how she imagines it will feel, how she can prepare, how she will be remembered, how her partner will manage, what she will miss, what she won't, how we can mourn together.

We are in uncharted territory here; the rules of my profession no longer have meaning. The boundaries that govern our psychoanalytic relationship — the 50-minute hour at prescribed times within the confines of my office, the carefully choreographed dance of free association and interpretation — are stretched beyond recognition.

Now the task is just a kind of witnessing, of being with her in any way she needs me to be. For her, I will travel an hour on public transportation, wipe her brow, dab her drool, fetch blankets, hold her hand, even sing a lullaby if that's what she wants.

How did I get here? It's not part of my training; I am not a hospice nurse or a social worker. I am not a friend or family member. And even though I specialize in treating the medically ill, I've always been a bit skittish on the topic of death.

Lately, however, I've acquired a different perspective. It came from caring for my parents at the end of their lives. Their last months were not terrifying, but momentous and profound. Sadly, I was too close, too emotionally attached, to have the kind of conversations I now have with my patient. Now I can remedy my regret. Returning to my practice after my parents' deaths, I have added the dying patient to my roster.

The work is draining and lonely. I often feel inadequate, out of my element, helpless. And I wonder about my motives. Do I think I can rescue my patient? Do I have a morbid side? Is there something exciting, voyeuristic about watching a patient's life slip away? I don't have the answers, and don't expect I ever will.

But I know that I'm deeply grateful to my patient, aware that she has graciously provided me a front-row seat for a moment more precious than any of us among the living can envision. This work is paradoxically enlivening: it has given my professional life — and my personal life — new richness and meaning.

Even as my patient contemplates death, she is exquisitely attuned to the wonders of everyday life, great and small. And in the midst of all this talking I realize that I'm enlivening her, as well — that as she listens, unable to do what I am doing, she can still imagine life as it was for her, can still smile at the experience of living in the humdrum of one's daily routine. Somehow, it feels as if we are bridging the chasm between the living and the dying.

I know why I sit talking with my dying patient. She is teaching me courage, depth, honesty and humility. I talk of her life and of mine, of the joys and regrets. Most of all, I talk about our time together and our heartfelt hope that she will slip peacefully away, knowing that she has done what she needs to do and knowing that I will never forget her as long as I live.

Dr. Ruth H. Livingston directs the psychotherapy referral service for medical patients at the William Alanson White Institute in New York.

http://www.nytimes.com/2009/06/02/health/02case.html?ref=science

The Demise of 'Form Follows Function'

By ALICE RAWSTHORN

If there was a (booby) prize for the most misused design cliché, a firm favorite would be "form follows function," with "less is more" coming a close second.

Not only is "form follows ..." often quoted incorrectly, it is not even accurate: the original wording was "form ever follows function." It is also routinely misattributed, mostly to 20th-century modernist grandees, like Le Corbusier and Mies van der Rohe, but was actually coined by the less famous American architect, Louis Sullivan.

Misused though Sullivan's quote has been, his point, that the style of architecture should reflect its purpose, made sense at the time, and continued to do so for much of the last century, not just for buildings, but objects too. That was then. Thanks to digital technology, designers can squeeze so many functions into such tiny containers that there is more computing power in a basic cellphone (not a fancy model, like a BlackBerry or iPhone, just a cheap one) than at NASA's headquarters when it began in 1958. That is why the appearance of most digital products bears no relation to what they do.

Take the iPod Shuffle. How could you be expected to guess what that tiny metal box does by looking at it? There are no clues to suggest that it might play music. Like most other digital devices, the Shuffle is (literally) an inscrutable box of tricks. Apple's designers conceived the latest model as a subtle joke on the demise of "form follows ..." It is so small, half the size of its predecessor, that they could make it in the same shape as one of those pins that clip on to clothing. This means the Shuffle's form does reflect one of its functions, albeit the very minor one of attaching itself to a jacket, but gives no hint as to its more important role of storing and playing hundreds of songs.

Joking aside, the dislocation of form and function has set a new challenge for designers: how to help us to operate ever more complex digital products. In ye olden days when form did follow function, you could guess roughly how to use an object from its appearance. But our ability to work out how to download and play music on a Shuffle is largely determined by the design quality of the software that operates it — the "user interface" in geek-speak, or "U.I." If the "U.I." is well designed, you should be able to use the device so intuitively that you will not have to think about it. But if it is badly designed, the process will seem so confusing that you will probably blame yourself for doing something wrong.

That is why the first wave of U.I. designs sought to reassure us by using visual references to familiar objects to help us to operate digital ones. Take the typewriter keyboards on computers, and video game controllers modeled on TV remote control pads. As our confidence has grown, U.I. design has become more sophisticated, increasingly relating to our physical behavior, rather than objects.

One landmark is Nintendo's Wii games system, which is operated by replicating the movements we would make if playing for real: from firing a "gun," to whacking a "tennis ball" with a "racquet." Another is Apple's iPhone, which replaced the traditional keyboard with a touch-sensitive screen that achieves a similar effect to the Wii by responding to the natural movements of our hands. The same goes for the thousands of applications, or "apps," invented for the iPhone, mostly by amateur programmers. Over a billion apps have been downloaded in the last nine months, and one reason for their popularity is that they feel so instinctive. An example is "Brushes," the $4.99 app with which the artist Jorge Colombo "drew" the cover of the June 1 edition of The New Yorker on his iPhone by creating digital layers of "paint" with his fingers, just as if he was making brushstrokes on a canvas.

The next phase of U.I. design will take this further. John Maeda, the software designer and president of the Rhode Island School of Design, believes that our current "awkward mechanical dance" with computers will be replaced by an intuitive approach. "It will need to be more improvisational," he said. "There will be a need for more subtlety and grayness."

One possibility is what techies call human interaction systems. An example is g-speak, which is now being developed by Los Angeles-based Oblong Industries as a means of operating computers through physical movements and gestures, rather than keyboards and mice. Think of how Tom Cruise "controlled" computers remotely in the 2002 movie "Minority Report." The students at the Rhode Island School of Design did that this spring in experiments with g-speak.

Another option is to swap physical means of controlling technology with voice recognition systems, which are already used in some devices, or pure intuition. San Francisco-based Emotiv Systems worked with the IDEO design group to develop the Epoc, a headset that enables you to play video games by monitoring electrical activity in your brain. It literally reads your mind through 16 sensors, which then relay your instructions to the console. "People are always ready for new or better or more sophisticated experiences — digital and physical," said Kara Johnson, a material scientist at the IDEO design group. "The role of the designer is to make them simple and meaningful."

Others are skeptical that voice recognition and brain sensor technology will ever be reliable enough to replace physical controls. "They work 'sometimes,' but 'sometimes' isn't enough for most people," explained Mr. Maeda. "But I'm the guy who thought in the early 1990s that making home pages on something called the World Wide Web was a silly idea, which would never catch on."

http://www.nytimes.com/2009/06/01/arts/01iht-DESIGN1.html?ref=design

Pigs offer new stem cell source

Chinese scientists have given cells from adult pigs the ability to turn into any tissue in the body, just like embryonic stem cells.

They hope the breakthrough could aid research into human disease, and the breeding of animals for organ transplants for humans.

It may also enable the development of pigs that are resistant to diseases such as swine flu.

The study appears online in the Journal of Molecular Cell Biology.

" **This breakthrough to produce pig stem cells potentially reinvigorates the quest to grow humanised pig organs** "
Professor Chris Mason University College London

Lead researcher Dr Lei Xiao, of the Shanghai Institute of Biochemistry and Cell Biology, said many other attempts had been made to transform adult cells from animals such as pigs into "pluripotent" stem cells, but they had failed.

He said: "Therefore, it is entirely new, very important and has a number of applications for both human and animal health."

Dr Xiao's team reprogrammed cells taken from a pig's ear and bone marrow, using a cocktail of chemicals introduced into the cells via a virus.

Tests showed that the reprogrammed cells were capable of becoming any of the cell types that make up the three layers in a developing embryo.

Ideal source

Dr Xiao said pigs were a potentially ideal source of organs for transplant, as their organs were similar in function and size to those found in humans.

He said reprogrammed stem cells could potentially be used to make a pig organ compatible to the human immune system, minimising the risk of rejection.

The cells could also be used to mimic human disease in pigs, allowing scientists to test new therapies without requiring human volunteers.

In addition to medical applications, Dr Xiao said his discovery could be used to improve animal farming, by making the animals healthier, and regulating the way they grow.

However, he warned it could take several years before some of the potential medical applications of his research could be used in the clinic.

Professor Chris Mason, an expert in regenerative medicine at University College London, said: "This breakthrough to produce pig stem cells potentially reinvigorates the quest to grow humanised pig organs such as pancreases for diabetics and kidneys for chronic renal failure.

"The clinical use of humanised porcine tissues and organs (xenografts) has moved a long way forward in recent months with successful small-scale clinical trials.

"Whilst the xenograft approach may not necessarily be the long-term solution, it may represent a major step change in the treatment of organ failure, which potentially could deliver real benefit to millions of patients within a decade."

Dr Sebastien Farnaud, science director of the Dr Hadwen Trust for Humane Research, said: "Persisting with highly speculative research that would see us use sentient animals as little more that living organ grow-bags, is not only ethically unsupportable but also scientifically dubious.

"Creating pig stem cells does not necessarily remove the risk of organ rejection but even more worrying is the risk of infecting patients and the wider public with pig viruses."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8078996.stm

Published: 2009/06/03 00:21:12 GMT

'Cancer hope' from diabetes drug

A common anti-diabetes drug may boost the potency of vaccines against cancer, research suggests.

Tests on mice found metformin, used for Type 2 diabetes, helps the body's T-cells work more effectively.

These cells, the body's key defenders against disease, "remember" former infections or vaccinations, enabling them to fight subsequent illness.

Writing in the journal Nature, a US team said metformin appeared to improve this important memory of disease.

This ability to remember disease has been the subject of much research, but there has been little understanding of the cellular mechanisms behind it.

The team from McGill University and the University of Pennsylvania used an experimental cancer vaccine and found that when administered in mice, the diabetes drug appeared to improve the strength of the inoculation.

Diseases 'linked'

Several studies in recent years have shown that people with diabetes may be more likely to develop certain cancers, although the exact nature of the relationship is unclear. Type 2 diabetes is associated with extra weight for instance, as are certain types of cancer.

But there also appear to be similarities between the basic chemical reactions which happen in the cells when affected by either of these diseases.

"Many genes involved in diabetes regulation also play a role in cancer progression," said Dr Russell Jones of McGill's Goodman Cancer Centre, one of the report's author.

"There is also a significant body of data suggesting that diabetics are more prone to certain cancers. However, our study is the first to suggest that by targeting the same metabolic pathways that play a role in diabetes, you can alter how well your immune system functions."

This is turn could help the body fight cancer more effectively with a vaccine.

Cancer vaccines are still at an early stage, but ideally could help both stop the disease developing in the first place or treat it when it arises.

Dr Kat Arney, Cancer Research UK's senior science information officer, said: "This is a fascinating piece of research, which sheds light on the complex links between the immune system, cell metabolism and cancer.

"At the moment, this research has only been done in mice and there is a long way to go before it can be applied to cancer patients, but it certainly holds promise for the future."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8081311.stm

Published: 2009/06/03 23:05:44 GMT

More premature babies surviving

Survival chances have greatly improved for premature babies, even those born extremely early, work reveals.

About 70% of babies born alive between 22 and 26 weeks gestation in Sweden now survive past the age of one, largely thanks to medical intervention.

But the authors say their study in the Journal of the American Medical Association does not answer the bigger ethical question over intervention.

Over half of the babies that survived experienced serious health problems.

" **Getting the balance right is really difficult and we need to keep this under constant review** "
Professor Neil Marlow, Expert in neonatal medicine The researchers looked at all infants born before 27 weeks gestation in their country during 2004-2007.

The overall perinatal mortality or death rate was 45%, meaning over half of the 1,011 babies born survived. Some babies died before they were born, and some during or immediately after birth.

Of the 707 live-born infants, 70% were still alive at the end of the year-long observation period of the study, which is many more than have been previously reported in studies. Analysis revealed the risk of death around the time of birth and in the first year of life was increased in the most premature.

Knowing when to intervene

For example, only five (10%) out of 51 babies born at 22 weeks survived to a year and only one of these without any major illness.

In comparison, 53% of those born at 23 weeks and 85% of those born at 26 weeks reached their first birthday, and up to half of them without serious illness.

" **We do not think that intervention should be done at any cost** "
Lead researcher Dr Karel Marsal

Medical interventions did appear to make a big difference to survival odds and probably explain why Sweden had such an impressive record. Babies born at hospitals with the best intensive care facilities and expertise and where active treatment was given - something common-place in Sweden - were far more likely to survive.

And of the 104 deaths occurring at least 24 hours after admission to a neonatal intensive care unit, 42 (40%) involved a decision to withdraw intensive care due to anticipated poor long-term prognosis.

The researchers say this suggests non-initiation or withdrawal of intensive care for extremely premature infants "cannot be based solely on a notion of unlikely survival." But they stress this is not to suggest that all extremely premature live-born infants should be kept alive at any cost.

Limits of viability

Lead researcher Dr Karel Marsal of Lund University Hospital said: "We do not think that intervention should be done at any cost. We do not have the final answer.

"Certainly, at 22 weeks the chance of surviving is very small, but at 23 weeks the results are much better.

"But gestational age alone is not enough to judge prognosis.

"We know from other studies that some of these premature babies might go on to have problems later in life and we will be monitoring them for this."

A UK study of premature births, called EPICure, found children born very early often had learning difficulties as well as physical problems such as cerebral palsy, blindness or deafness.

As well as the long-term outlook for the child, parental desires need to be taken into account, said Dr Marsal.

Then there are the financial implications of intervening. Researchers at the Oxford Centre for Health Economics estimate the cost of an average preterm baby is one and a half times more than a baby born full term, which equates to extra £939m a year for the whole of the UK in terms of healthcare, education costs and parental lost earnings.

The rate of premature births has increased sharply in recent years. In 2006, 7% of all births in England were preterm - a total of almost 48,000 babies - rising to 8.6% in 2007.

Professor Neil Marlow, who has been running the EPICure studies, said: "Even with better survival rates, the rate of morbidity, meaning problems that the babies have, is still very high.

"That is why we tend to be less aggressive than in Sweden with the care we offer babies born at 23 weeks gestation and younger because we believe the risks outweigh the benefits in terms of outcomes.

"But getting the balance right is really difficult and we need to keep this under constant review."

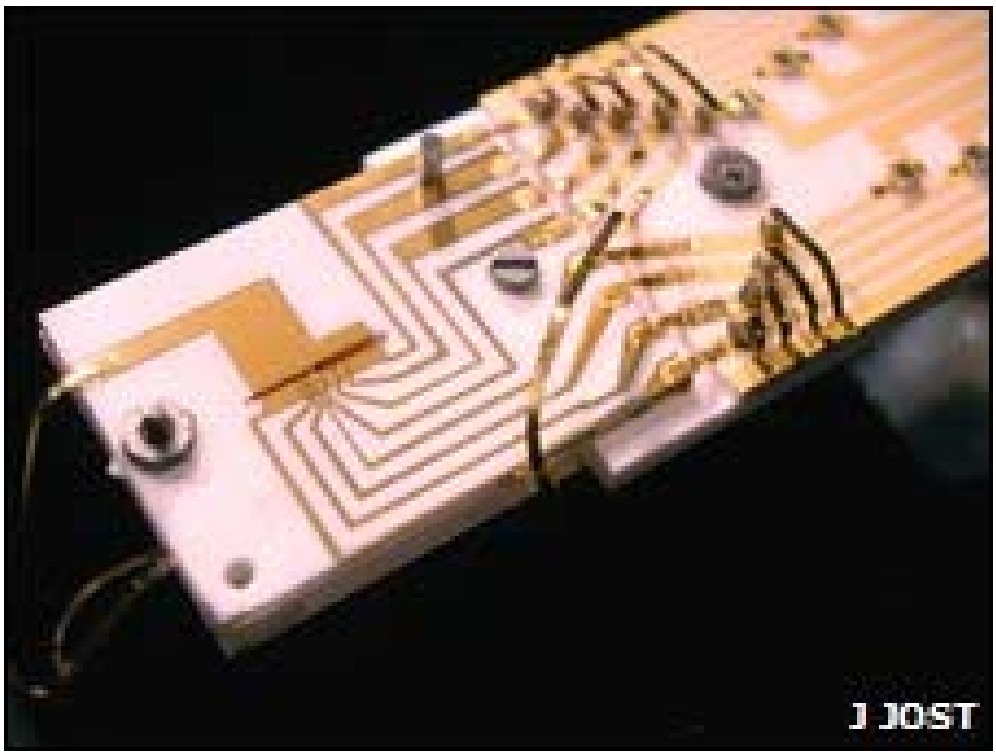
Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8078911.stm

Published: 2009/06/03 23:05:32 GMT

Bridging the gap to quantum world

By Jason Palmer
Science and technology reporter, BBC News

Scientists have "entangled" the motions of pairs of atoms for the first time.



Entanglement is an effect in quantum mechanics, a relatively new branch of physics that is based more in probability than in classical laws.

It describes how properties of two or more objects can be inextricably linked over "vast" distances.

The results, published in Nature, further bridge the gap between the world of quantum mechanics and the laws of everyday experience.

This is the first time entanglement has been seen in a so-called "mechanical system".

The phenomenon suggests that a measurement performed on one object can affect the measurement on another object some distance away.

" **What we wanted to do was to perform this entanglement in the sort of system that people can relate to, a mechanical system that pervades nature everywhere** "
John Jost, Nist

It also implies that the behaviour of two separate objects is linked by some unseen connection - an idea that Albert Einstein described as "spooky".

Entanglement could be exploited in future quantum computers, because the inherent probability-based nature of quantum systems means they can compute certain kinds of problems significantly more quickly than current "classical" computers.

The delicate effect has until now been limited to the internal properties of tiny systems - ethereal connections such as the polarisations of a pair of light packets called photons, or the spins of electrons in atoms.

In 2005, clouds of eight atoms were shown to be completely entangled by a group at the Institute for Quantum Optics and Quantum Information in Austria (IQOQI).

However, a pressing question for quantum researchers is when - or if - these spooky effects stop as the number of entangled photons or atoms grows.

"In the scientific community there isn't really a clear answer as to why we don't see entanglement or its effects in our everyday life," said John Jost, a researcher at the National Institute for Standards and Technology (Nist) in the US.

To begin to address that, Mr Jost and his colleagues developed a means to entangle the actual motions of two pairs of atoms: a more tangible and visual property of a system than electron spins and photon polarisations.

"What we wanted to do was to perform this entanglement in the sort of system that people can relate to, a mechanical system that pervades nature everywhere: a vibrating violin string, the pendulum on a clock, the quartz crystal in your digital watch," Mr Jost told BBC News.

Energetic kick

The intertwining involved four electrically charged atoms, or ions - two beryllium and two magnesium ions. These are prepared in a device called an ion trap that uses electric fields to manipulate the charged particles.

The positively charged ions repel one other, and behave as if they are connected by a spring. This "spring" has a natural resonant frequency, just like a pendulum, which can be excited with the "kick" of a laser of just the right colour.

First, a laser is used to entangle the internal energy states - the "spins" - of the two beryllium ions.

The four ions are then separated into two pairs, each made up of a beryllium and a magnesium ion four micrometres apart. The pairs themselves are separated by 240 micrometres - just a few hairs' breadths, but an enormous distance in the atomic world.

The magnesium ions are cooled with lasers, which in turn removes excess energy from the beryllium ions.

Further laser pulses then provide an energetic "kick" to ensure the beryllium ions are no longer entangled via their spin states, but are now entangled via their motions.

The entangled pairs move in perfect unison despite their separation distance.

The work closes some of the gap between two directions of research that investigate where the quantum world ends and our everyday, classical world begins.

"We're using a bottom-up approach where you start with a very simple mechanical system; you can imagine that adding more and more ions to this, you could scale it up," Mr Jost explained.

"But there's a whole field of research in so-called nano-mechanical resonators: they're taking the top-down approach, trying to use a tiny beam of atoms - still composed of millions of atoms - and cooling it down until they see these quantum mechanical effects."

IQOQI researcher Christian Roos said: "There is certainly an interest to see two objects in a different kind of entanglement than the one that has been investigated so far" .

"At the moment it's pure curiosity, to see how far it can go," he added.

Nothing in quantum mechanics precludes entanglements of larger numbers of atoms, but as the bottom-up and top-down pursuits meet in the middle, researchers might discover there is more to quantum mechanics than they currently understand.

"There are theories that there are mechanisms that are not yet understood that prevent macroscopic systems becoming entangled once they become more massive," Dr Roos told BBC News.

"So from that point of view it's certainly interesting to see entanglement at a very small scale, and then to see whether it is possible to entangle heavier objects."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8081058.stm

Published: 2009/06/03 21:02:26 GMT

Armstrong's 'poetic' slip on Moon

By Pallab Ghosh
Science correspondent, BBC News

Neil Armstrong missed out an "a" and did not say "one small step for a man" when he set foot on the Moon in 1969, a linguistic analysis has confirmed.

The researchers show for the first time that he intended to say "a man" and that the "a" may have been lost because he was under pressure.

They say that although the phrase was not strictly correct, it was poetic.

And in its rhythm and the symmetry of its delivery, it perfectly captured the mood of an epic moment in history.

There is also new evidence that his inspirational first words were spoken completely spontaneously - rather than being pre-scripted for him by Nasa or by the White House. In the recording of Neil Armstrong's iconic phrase he says: "One small step for man. One giant leap for mankind". However, "man" and "mankind" mean much the same thing in this context.

But on returning to Earth, he explained that he thought he had said "one small step for a man".

Explanations offered for the discrepancy are that perhaps transmission static wiped out the "a" or that Commander Armstrong's Ohio accent meant that his "a's" were spoken softly.

In 2006, an analysis by an Australian entrepreneur added credence to these explanations - as it found there was a gap for the "a". However, subsequent analyses disputed this conclusion.

To settle the argument, Dr Chris Riley, author of the new Haynes book Apollo 11, An Owner's Manual, and forensic linguist John Olsson carried out the most detailed analysis yet of Neil Armstrong's speech patterns.

They are presenting the research at the Cheltenham Science Festival this week.

"For me that phrase is of great significance," said Dr Riley.

"It has been an important part of my life and those words sum up much of the optimism of the later part of the 20th Century."

Using archive material of Neil Armstrong speaking, recorded throughout and after the mission, Riley and Olsson also studied the best recordings of the Apollo 11 mission audio ever released by Nasa.

They have been taken from the original magnetic tape recordings made at Johnson Space Center, Houston, which have recently been re-digitised to make uncompressed, higher-fidelity audio recordings.

These are discernibly clearer than earlier, more heavily compressed recordings used by the Australian investigation.

These clearer recordings indicate that there was not room for an "a". A voice print spectrograph clearly shows the "r" in "for" and "m" in "man" running into each other.

The researchers say the Australian analysis may not have picked up the fact that Armstrong drawled the word "for" so that it sounded like "ferr" and mistook the softly spoken "r's" for a gap. "It's perfectly clear that there was absolutely no room for the word 'a'," Mr Olsson explained.

Riley and Olsson also concluded that Commander Armstrong and his family members do pronounce the word "a" in a discernible way.

And based on broadcasts from Neil Armstrong and Buzz Aldrin from the surface of the Moon, it is clear that the word "a" was easily transmitted to Earth without being obliterated. But their analysis of the intonation of the phrase strongly suggests Commander Armstrong had intended to say "a man". There is a rising pitch in the word "man" and a falling pitch when he says "mankind".

According to Mr Olsson: "This indicates that he's doing what we all do in our speech, he was contrasting using speech - indicating that he knows the difference between man and mankind and that he meant man as in 'a man' not 'humanity'."

There has also been speculation that Neil Armstrong was reading from a pre-prepared script penned for him by another party. According to Mr Olsson, that is not borne out by Armstrong's body language and speech patterns.

"When you look at the pictures, you see that he's moving as he is speaking. He says his first word 'that's' at the moment he puts his foot on the ground. When he says 'one giant leap for mankind', he moves his body," he said.

"As well as this, there is no linking conjunction such as 'and' or 'but' between the two parts of the sentence. So it's for all those reasons that we think this is a completely spontaneous speech."

It may well have been that spontaneity that led to Armstrong's slight mistake. But according to Mr Olsson - Armstrong may have subconsciously drawn from his poetic instincts to utter a phrase that, far from being incorrect - was perfect for the moment. "When you look at the whole expression there's a symmetry about this. If you put the word 'a' in, it would totally alter the poetic balance of the expression," he explained.

This makes Dr Riley feel that the research has made a positive contribution to the story of the Apollo mission.

"I'm pleased we've been able to contribute in this way and have hopefully drawn a line under the whole thing as a celebration of Neil and everyone involved with Apollo, rather than this constant little niggling criticism," he said.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8081817.stm

Published: 2009/06/03 23:26:46 GMT

Origin of Antarctic ice revealed

By Victoria Gill
Science reporter, BBC News

Incredible peaks and valleys, buried beneath ice for 14 million years, have revealed evidence of how the East Antarctic ice sheet first formed.

Scientists used radar to map an area of the Gamburtsev mountains - believed to be the point of origin of the ice.

The region would have been cold enough for the first glacier to form.

Writing in the journal Nature, the researchers say their findings provide important clues about how the ice sheet will behave as our climate changes. "This is the largest reservoir of ice on Earth, and the most poorly understood place on our planet," said the British Antarctic Survey's Fausto Ferraccioli, a scientist involved in a separate international project to study the region.

He explained that the elevation and location of the Gamburtsev Mountains - in the centre of the ice sheet - made them an "ideal place" for the formation of the very first ice.

Icy unknown

Sun Bo from the Polar Research Institute of China, who led this study, has now provided further insight into the evolution of the ice sheet.

He and his colleagues travelled 1,235km (767 miles) by tractor train from a research station at the edge of East Antarctica, to the summit of Dome A of the Gamburtsev range, near the centre.

" **Peering down at the ice sheet underneath your feet, you just don't know what's under there** "
Martin Siegert University of Edinburgh

Dr Sun's team then attached radar equipment to the tractor and drove around, meticulously surveying a 30km by 30km square of the glacial region.

Their radar revealed a landscape that, 14 million years ago, looked similar to the European Alps.

"This is true scientific exploration," said Martin Siegert, head of the school of geosciences at Edinburgh University, who was also involved in the study.

"There's nothing to guide you really. Peering down at the ice sheet beneath your feet, you just don't know what's under there."

And for this type of exploration, the use of radio waves is very powerful.

When the waves reach the interface between ice and rock they bounce back, because of the difference in electrical properties between the two.

"You just measure the two-way travel time as they go down and come back up again," explained Dr Siegert. "Then you can convert that to ice thickness, because you know the velocity at which [the radio waves] are travelling."

Dr Siegert said the research team was "very lucky" to see such a clear image of the underlying landscape. They discovered a whole valley system - with mountains at the edge of the survey region and the valley in the middle.

"That's perfect, because it allows us to work out how the valley would have worked when it was filled with ice, and how the water would have flowed when there was no ice there at all," said Dr Siegert.

Frozen in time

By looking at ancient climate patterns, scientists have previously estimated that the East Antarctic ice sheet formed around 14 million years ago, burying and preserving the Gamburtsev mountain landscape under ice that is now up to 3km thick.

"You need a mean annual temperature of about 3C for the glaciers to form the way they did," Dr Siegert told BBC News. "The mean annual temperature in this region now is -60 C. So we believe that these mountains are relics of [glacial erosion] in Antarctica before the ice sheet was in place."

He added that the findings provided an insight into the stability of the ice.

"It is a critical part of our Earth's system," said Dr Ferraccioli. "If the whole ice sheet collapsed, sea levels would rise by 60m.

"There's been a lot of climate change over the last 14 million years," Dr Siegert said. "And what we can say about this place in the middle of the Antarctic is that nothing has changed."

But, he warned, if levels of atmospheric carbon dioxide continued to rise, in around 1,000 years they will approach the same levels that existed "before there was a persistent ice sheet in Antarctica".

"This puts the ice sheet into the context of global climate and what conditions are needed to grow an ice sheet," explained Dr Siegert. "The worrying thing is that we seem to be going back to carbon dioxide concentrations consistent with there being a lot less ice around."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8079767.stm

Published: 2009/06/03 17:06:19 GMT

Activities 'improve exam results'

Pupils who take part in several extra-curricular activities tend to perform better in exams, research by the Independent Schools Council suggests.

A study of 508 private schools found the number of pupils getting GCSE grade B or above was linked to the number of extra-curricular activities on offer.

Pupils in top-performing schools took part on average in 50% more activities than those in weaker schools.

ISC said extra-curricular activities were key to wider academic success.

Its research found schools offering 30 or more activities were more likely to have nearly 100% of pupils achieving grade B or above at GCSE level.

Schools offering 20 activities saw just 30% of pupils achieving these results.

ISC chief executive David Lyscom said: "This new research now shows how important extra-curricular activities can be in underpinning academic achievement."

Cricketers' performance

At the independent school Harrow, the exam results of the First XI cricket team are closely scrutinised because a high number of matches takes pupils out of lessons during the summer term.

Head master Barnaby Lenon said they repeatedly found that the team's A-level results were very good, often better than expected.

Mr Lenon said extra-curricular activities - be they sporting or otherwise - were central to the experience of any educated person.

"Extra-curricular activities can produce, in a less academic boy in particular, a level of enjoyment and motivation which spills over to his academic work.

"Boys come with a more positive approach to school life than if it were all work and no play.

"Art and music have a very great and disproportionate effect on the morale of the whole school and lead to life-long interest."

A spokesman for the Department for Children, Schools and Families said ministers agreed with the findings of the ISC research.

"We are investing £1 bn for extended schools over 2008-2011 to ensure that extra curricular activities, including sports, are available to all pupils in the state sector," he said.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/8080865.stm

Published: 2009/06/03 11:44:18 GMT

Chicago blues legend Koko Taylor dies at 80

Koko Taylor more than once said she hoped that when she died, it would be on stage, do
she loved most: Singing the blues.

She nearly got her wish. The Chicago musical icon died Wednesday at age 80 of complications from gastrointestinal surgery less than four weeks after her last performance, at the Blues Music Awards in Memphis, Tenn. There she collected her record 29th Blues Music Award, capping an era in which she became the most revered female blues vocalist of her time with signature hits "Wang Dang Doodle," "I'm a Woman" and "Hey Bartender."

Taylor died at Northwestern Memorial Hospital 15 days after her May 19 surgery. She appeared to be recovering until taking a turn for the worst Wednesday morning, and was with friends and family when she died.

"Koko Taylor's life and music brought joy to millions of people all around the world and Chicago is especially honored that she called our city her home for more than 50 years," Chicago Mayor Richard J. Daley said. "The strength of her style was formed in the night clubs of Chicago's South Side and she

carried that spirit with her wherever she went. She was an ambassador for our city and truly was the queen of a kind of music that makes people think of Chicago whenever they hear it."

Among those with her Wednesday was Bruce Iglauer, owner of Chicago-based Alligator Records, who was her producer, manager and friend since 1974.

He recalled that Taylor had a similar surgery in 2004 and was on a ventilator for nearly a month. "The doctors were very discouraged then about her coming back, and she willed herself back to life," Iglauer said. "We were hoping she would do the same this time."

Born Cora Walton in 1928 in Memphis, Tenn., Taylor literally got up off her knees to become a blues icon.

Growing up on a sharecropper's farm outside Memphis, young Cora and her three brothers and two sisters slept on pallets in a shotgun shack with no running water or electricity. By the time she was 11, both her parents had died. She picked cotton to survive, and moved to Chicago in the early '50s to be with her future husband, Robert "Pops" Taylor, who died in 1989. She found a job working as a domestic, scrubbing floors for rich families.

She had sung gospel music in church while living in the South, and on weekends would attend the blues clubs on Chicago's burgeoning South Side scene, the heyday of Chess Records and such stalwarts as Muddy Waters, Howlin' Wolf and Willie Dixon. She would occasionally sit in and caught the ear of Dixon, who approached her in the early '60s about recording one of his songs, "Wang Dang Doodle."

"I didn't know Willie Dixon from Adam's house cat," Taylor recalled in an interview with the Tribune. "But he says to me, 'I love the way you sound' and, 'We got plenty of men out here singing the blues, but the world needs a woman like you with your voice to sing the blues.' "

Taylor's 1965 hit recording of "Wang Dang Doodle" launched her career, and established her sound: a gruff, no-nonsense roar that was the female equivalent of Howlin' Wolf's baritone growl. By becoming a band leader and a powerful voice in a male-dominated scene, she broke down barriers for many female entertainers who followed.

"Some of the lady singers who were working little local clubs, or maybe just attempting to sing in choirs and churches, they got into the blues scene because of Koko," said Bob Koester, founder of Delmark Records. "Zora Young, Big Time Sarah, Shirley Johnson - they were inspired to try to come out and sing blues because of Koko's success. Without Koko, that might not have happened."

But when Chess folded in the early '70s, Taylor was back where she started, scrapping for a living.

"It was a devastating time for my mom," Taylor's daughter, Joyce "Cookie" Threatt, once told the Tribune. "Then she met Bruce [Iglauer]. It was like God put him there."

Iglauer had never worked with a female vocalist before on his fledgling label, which was dominated by guitar-playing men. But he was impressed by Taylor's moxie and her sound.

"She was of the same generation as Muddy and Wolf, she had those [Mississippi] Delta roots," he said Wednesday. "Even though she had been living in Chicago since the '50s, her music was still deeply rooted in the South. She had that rhythmic sense, that sense of where you lay the words and how the band locks in around the singer, that intensity of people who have lived that life."

Taylor was already a distinctive artist when she came to Alligator, and with Iglauer's help began exploring a more vulnerable side to her persona on select ballads such as her epochal version of the Etta James hit "I'd Rather Go Blind." Even when recording other people's material, the singer put her idiosyncratic touch on it, usually singing it a cappella in the studio, with the musicians following her.

Taylor never adopted the blues lifestyle of hard drinking and philandering that consumed some of her peers. She was a devout woman, but at the same deeply appreciative of how the blues communicated honestly and directly about everyday life.

As her daughter once told the Tribune: “She grew up singing in [the Baptist] church in Memphis, and people come into church to get washed. They don't come in there already clean."

At the same time, she was not one to mince words. She could be devastatingly direct with anyone who crossed her.

“She was meticulous about her music, so if her band screwed up, they would hear about it,” Iglauer said. “She would not bite her tongue.”

For her, the blues was life. She bounced off her death bed in 2004 to write and record another album, the aptly titled “Old School,” released in 2007 on Alligator. It would prove to be her final recording, though Iglauer said that in recent months Taylor was calling him and singing new songs over the phone.

“She was scheduled to go to Spain next week,” he said. “She was still performing. At the Blues Awards in Memphis a few weeks ago, she was absolutely glowing. She would be exhausted standing by the edge of the stage, but when the lights went up, she would hop up and dance as soon as the music started. She would always say, ‘If I can brighten one person’s day with my music, that’s what I live for.’ ”

Survivors include her husband, Hays Harris; daughter Joyce Threatt; son-in-law Lee Threatt; grandchildren Lee Jr. and Wendy; and three great-grandchildren.

Funeral arrangements are pending.

greg@gregkot.com

The Tribune’s Howard Reich contributed to this report.

http://leisureblogs.chicagotribune.com/turn_it_up/2009/06/chicago-blues-legend-koko-taylor-dies-at-80.html

Unwritten Code Rules Silicon Valley Hiring

By MIGUEL HELFT

SAN FRANCISCO — Silicon Valley was abuzz Wednesday with news that the Justice Department had begun an antitrust investigation into the hiring practices of some of the best-known companies in the technology and biotech industries, including Google, Apple, Yahoo and Genentech.

The question being asked most frequently was how the word "anticompetitive" could possibly be applied to the industry's perpetual fight over talent. But some employment and antitrust lawyers, recruiters and others said that while Valley companies compete aggressively for top engineers, marketers and executives, it is not a free-for-all.

"There is a gentlemen's understanding all over the Valley that, it's not that you don't hire, it's the process by which you hire," said Randy Komisar, a partner at the venture capital firm Kleiner Perkins Caufield & Byers.

Some veteran human resources executives said that hiring was not so much the issue; employees are free to look for work pretty much anywhere. But they say major companies often have an unwritten agreement to not actively poach employees from their partners.

That may be precisely what attracted notice from regulators. The exact focus of the investigation is unclear, but people with knowledge of it said Justice Department lawyers were focusing on whether companies had agreements not to go after each other's employees. That could restrict movement in the job market and prevent wages from rising.

On Wednesday, Google, Genentech and Yahoo acknowledged that they had been contacted by the Justice Department about the investigation but declined to comment further.

People with knowledge of the investigation said that Microsoft and Intel were also among the companies that received requests for information.

Representatives for Apple, Microsoft and Intel declined to comment.

Some recruiters said it was commonplace for companies to have a list of partners that were off-limits.

"Most companies have a hands-off list," said Ken Perluss, who recently left Yahoo as director for talent acquisition after more than 11 years with the company. "It tells recruiters, 'Don't recruit from this company. They are our partner.' "

Direct competitors are usually fair game, he said, adding that he did not know of any arrangements between Yahoo and other companies on recruiting.

Deborah Rousseau, who worked as a contract recruiter at Google until 2006, said that the company gave recruiters a list of firms from which they could not recruit. "We didn't always know the reason for it, but they were very clear about who was hands-off," said Ms. Rousseau, who is now a recruiter at Plantronics.

A December 2007 e-mail message written by a Google recruiter and obtained by The New York Times suggests that the company might have had an agreement with Apple on recruiting.

Laura Sheppard, a contract recruiter at Google, sent the e-mail message to a job candidate asking him to put her in touch with another potential candidate. "It is a bit touchy since he works for Apple," Ms. Sheppard wrote, adding that Google had "a nonsolicit agreement with them."

Google declined to comment on its hiring practices or on the e-mail message, whose authenticity could not be independently verified. Ms. Sheppard, who recently stopped working at Google, said she didn't recall sending the e-mail message and declined to comment further. Apple declined to comment.

Gary L. Reback, a lawyer at Carr & Ferrell, who in the 1990s helped persuade the Justice Department to pursue its case against Microsoft, said that a company was generally free to choose not to recruit employees from its partners. But when two or more companies agree to steer clear of each others' employees, regulators could raise questions.

"It is not the off-limits part that I suspect they are looking into," Mr. Reback said. "I suspect they think there is a quid pro quo of some kind. Antitrust counselors would advise clients not to do this kind of thing."

Brad Stone contributed reporting.

http://www.nytimes.com/2009/06/04/technology/companies/04trust.html?_r=1&th&emc=th

Over and Over: Art That Never Stops

By RANDY KENNEDY

VENICE — The Palazzo Michiel dal Brusa, a grand 14th-century pile here near the Rialto Bridge, is not exactly a place of desolation. It is filled with frescoes and lapped by the waters of the Grand Canal, and in the afternoon its cavernous first floor is suffused with a tender Renaissance light.

But when the Icelandic artist Ragnar Kjartansson invited a reporter to visit him there the other day, he wrote, “See you at the abyss.” And what anyone who stops by his work space at the palazzo will find, now or over the next six months, is a farcically romantic idea of what the end of the world might look like, at least for an artist: Mr. Kjartansson, standing at an easel day after day, relentlessly painting the portrait of a man who poses before him in a black Speedo, cigarette and beer in hand.

As time passes, the canvases Mr. Kjartansson makes — he plans to complete one a day — will mount up around him, as will the empty bottles and butt-filled ashtrays, all of it a monument to artistic ruin. On Tuesday, the second day of a marathon that will drag on until Christmas, the elegiac effect was heightened by Mozart’s Requiem blaring from an old record player.

“Stand, please,” Mr. Kjartansson said to the model, a friend and fellow Icelandic artist named Pall Haukur Bjornsson.

“O.K.,” Mr. Bjornsson said listlessly, rising from a couch, dropping his blue terrycloth robe and leaning against a stone cistern as Mr. Kjartansson, with a painterly beard and slicked-back hair, mixed oil paint on a palette.

Since its creation in 1895, the Venice Biennale has always functioned as a kind of art Olympiad, with nations proudly showcasing their best artists in ostentatious pavilions.

So after Mr. Kjartansson (his name is pronounced RAG-ner kuh-YART-un-sun) was chosen to represent Iceland last year, he said, he first had to figure out what it would mean, exactly, to be the artistic exemplar of a now near-bankrupt country, one of the hardest hit by the financial crisis. And also what the Biennale itself would represent this year, in its first incarnation since all the air escaped from the great art bubble of the past decade.

His idea, at an event where art installations can sometimes be large enough to arrive on cargo ships, was to make a project rigorously stripped of the extraneous and the expensive: just himself, some cheap art materials and a subject. The only luxury would be time, which in this case might be viewed instead as penance.

“I just had this image of this guy, smoking, drinking, by the water, looking out at the Prosecco Venetian light,” Mr. Kjartansson said. “I thought of him as this man without fate — which is all what we’re living back home, in a way.”

Titled “The End,” the performance grows out of much recent work by Mr. Kjartansson, 33, a darkly funny provocateur whose profile has been rising in the art world. (He is represented by the prominent

Chelsea gallery Luhring Augustine; Daniel Birnbaum, the curator of this year's Biennale, chose him to participate in another large international exhibition he oversaw last year in Turin.)
His work often involves the idea of endurance, nodding to pioneering performance artists like Chris Burden and Marina Abramovic. But it is overlaid with a kind of self-conscious goofiness that plays on both Nordic notions of the tragic and on the predicament of the contemporary artist feeling his way around an increasingly fragmented, disorienting art world.
In a 2002 work called "Death and the Children" he dressed up in a dark suit and carried a scythe, leading young children — who had no idea what the costume meant — through a cemetery, trying earnestly to answer their questions about fate. In 2007 in a piece called "God," he wore a tuxedo and played the role of an old-fashioned crooner on a pink-draped stage with an orchestra, singing, "Sorrow conquers happiness" over and over as the music swelled.
Last year in a performance that could be seen as a warm-up for Venice, he assumed all the clichéd trappings of a plein-air painter, sitting on a hillside in upstate New York with an easel, smoking cigars and reading "Lolita" while he worked.
Mr. Kjartansson, who trained as a painter at the Icelandic Academy of the Arts, said his intention in neither that work nor in Venice was to disparage painting. In the manner of many young artists now, he seems to be trying to express a kind of simultaneous reverence and mockery, though maybe only the mockery of ribbing himself for longing to be a more traditional artist.
"I think, secretly, it's what every artist wants to do, just to sit and paint and smoke and think," he said.
On Tuesday afternoon Mr. Bjornsson was doing most of the smoking, a steady stream of Benson & Hedges, as Mr. Kjartansson was filling in the contours of his second portrait. Behind them on stone benches lay dozens of stretched, blank canvases waiting to be filled. The tables and floors of the palazzo, which Iceland rents as its pavilion, were already strewn with empty Peroni and Moretti beer bottles.
"I'm going to be completely soulless by the time he's done," said Mr. Bjornsson, who said that he generally did not smoke or drink this much and was a little worried about the effects on his health. To pass the time when not posing, he said he planned to improve his guitar playing and read a lot. In a stack beside him sat volumes of Wilde, Eliot, Ovid and the Upanishads.
Mr. Kjartansson, a talkative and (for now at least) cheerful man, put a daub of cadmium yellow on the canvas, trying to capture the essence of the racing stripe down the side of Mr. Bjornsson's Speedo. He stood back to assess his progress. "So you can see that I am not a very good painter," he said. "But after six months surely I'll get better, right?"
Markus Thor Andresson, one of the curators of the Icelandic pavilion along with Dorothee Kirch, said it was still unclear what would happen to all the paintings. "It's kind of sad because he sincerely wants them to be good paintings," Mr. Andresson said. "But even if they're done well, Ragnar always has to face the fact that they won't be seen as paintings. They're only ever going to be seen as artifacts from this performance."
Mr. Kjartansson said he kept trying to envision what the palazzo's floor was going to look like by year's end, made impassable by the paintings and their attendant detritus. Asked if he thought he might be tired of seeing Mr. Bjornsson by then, he laughed uproariously and said, "Probably so."
"And," he added, "just think how sick he's going to be of me."

http://www.nytimes.com/2009/06/04/arts/design/04icel.html?ref=design

When a Picture Is Worth a Thousand Debates, Give or Take

By MICHAEL KIMMELMAN

PARIS — There is a civil contract implied by photographs. An Israeli writer, Ariella Azoulay, published a book making that point. Henri Cartier-Bresson made it too. He described shooting pictures of people as a "sort of violation," adding, "if sensitivity is lacking, there can be something barbaric about it." There can be, of course, and not just when the subject doesn't like the image.

We, viewing the pictures, are complicit. As consumers of images we bear witness through them. Or we're voyeurs. In either case we complete a transaction that we instigated, in that a photograph is made hoping someone will look at it. It's a message tossed into the ocean of time, and how we read that message, whether indifferently or with compassion, can have moral dimensions.

All this is the familiarly messy, philosophical heart of photography, and it's also the subject of a show that just closed here, itself a mess. "Controversies: A Legal and Ethical History of Photography" was organized by Christian Pirker and Daniel Girardin, a lawyer and a curator from Switzerland, where the exhibition originated. Louvre-length, two-hour lines daily snaked out the door of the Bibliothèque Nationale here until the end of last month. (The show moves on to South America.) Inside, scrums of visitors clustered before 80 or so pictures, more or less famous troublemakers, spanning the era of the daguerreotype through Abu Ghraib.

Like everywhere else, sex and violence sell in Paris. "Controversies" ended with a David LaChapelle photograph of a white stallion nibbling on Angelina Jolie's bare breast, the ostensible excuse for which was some legal squabble about depicting sex with animals.

There were also wall texts about copyright and fair use laws, about public decency debates, hoaxes and shifting social standards to accompany pictures like Annelies Strba's photograph of a 12-year-old girl named Sonja in her bubble bath, Secundo Pia's picture of the Shroud of Turin, Todd Maisel's dismembered hand from 9/11 and Paul Watson's image of the corpse of an American Marine dragged through the streets of Mogadishu by an angry mob.

Near Kevin Carter's unbearable view of a starving, huddled Sudanese child stalked by a vulture, an advertisement by Oliviero Toscani for Benetton posed two glamorous models as nun and priest, kissing.

A mess, as I said. But willy-nilly, some big questions arose. The biggest, as Mr. Girardin ventured by telephone the other day, was, "What is possible to show in a photograph?" He elaborated: "What does society accept or refuse? Why are some pictures shown over and over, and then they suddenly become unacceptable?"

In that case he was alluding to a portrait by Boris Lipnitzki from 1946, not a remarkable photograph but a curious case. Jean-Paul Sartre leans over the footlights at the Théâtre Antoine, pinching the remains of a smoldering cigarette between his fingers. This is the picture that in 2005 the Bibliothèque Nationale doctored for the cover of a catalog for a Sartre exhibition. The library expunged the cigarette. Nearly a decade earlier French postal authorities, as part of a national anti-smoking campaign, issued a stamp based on a famous snapshot by Gisèle Freund of André Malraux, tousled, perennial cigarette between lips. Authorities guillotined the cigarette.

That rightly burned French critics who decried — this was the French equivalent of freedom fries, you might say — what they called American-style political correctness, notwithstanding that the history of photography is rife with subterfuges concocted in the name of some greater social good, American and otherwise. It happens that "Controversies" included one of those tinkered Soviet photographs of Stalin

from which Nikolai Yezhov, bloodthirsty head of the secret police, himself executed when he fell out of favor, has been purged like Malraux's Gauloise.
One regime's moral authority is another's tyranny.
Which gets back to the original question about civic contracts. By virtue of its economy and proliferation, photography has been one of the most convenient weapons of the powerless even while it serves the powers that be. During the early 1960s, when French authorities required Algerians to have identity cards, a conscript in the French Army, Marc Garanger, was ordered to shoot their portraits. He photographed some 2,000 Algerian women, many of whom had been, until they uncovered themselves for his camera, veiled throughout their adult lives.
This was a profound violation for these women. Making the pictures turned Mr. Garanger entirely against French rule. He registered his opposition in these official portraits, through the humanity of his subjects, whose anger, which the pictures make perfectly obvious, conveyed both their oppression and resistance.
"For 24 months I never stopped, sure that one day I would be able to testify with these images," Mr. Garanger recalled two decades later. "All of this I did with more force than the dominant military ideology of the era that surrounded me with hatred and violence."
With more enduring effect anyway. A particularly beautiful portrait of a woman named Cherid Barkaoun, mournful but proud, large eyes kohl-rimmed, hair braided, absently clutching a scarf to her chest as if to keep hold of some sliver of privacy, reaches across half a century.
Compelling our attendance in a very different respect are the blurry, clandestine photographs shot at Auschwitz-Birkenau in August 1944, by a Sonderkommando, one of the prisoners forced to assist in the exterminations, a Greek Jew known as Alex. He perished like the rest. The only photographic remains of the mass killing in process, these pictures include a view taken through a doorway from inside one of the gas chambers. (The black of the door frame serves as an obvious metaphor.)
Bodies are being cremated in a pit outside. Apparently too many victims overwhelmed the Nazi crematoriums. So under a bright sun, several figures, other Sonderkommandos, one of them walking as if on a tightrope among the corpses, stand before plumes of rising smoke and mounds of the dead in the open field, waiting to throw more remains on the pyre.
I stress this gruesome photograph because a few years ago a debate transpired in France over whether these pictures should be seen at all. Claude Lanzmann, the director of "Shoah," and two others, Gérard Wajcman and Elisabeth Pagnoux, insisted they shouldn't, that what happened at the camps can't be adequately represented in archival snapshots, which provide only some fraction of the truth. "Archival images are images without imagination," Mr. Lanzmann explained at the time, having avoided them in his film by relying on testimonials, which by implication presented the Holocaust as an enduring calamity.
Against Mr. Lanzmann's injunction, Georges Didi-Huberman, a French art historian, wrote a book defending the value of looking at the Birkenau pictures. It seems absurd now, a debate from Planet Academe. The pictures need to be seen, to bear witness to what happened, because knowing is better than not knowing, and also to complete the transaction with Alex and a dozen others who sneaked the camera into the camp and smuggled the negatives out in a tube of toothpaste.
But tortured though it was, at heart that French debate revolved around a deep truth. Years ago Susan Sontag recalled her first sight, at 12, of the pictures taken by British soldiers arriving at Bergen-Belsen. "When I looked at those photographs, something broke," she wrote in "On Photography." "Some limit had been reached, and not only that of horror. I felt irrevocably grieved, wounded, but a part of my feelings started to tighten; something went dead; something is still crying. To suffer is one thing; another thing is living with the photographed images of suffering, which does not necessarily strengthen conscience and the ability to be compassionate. It can also corrupt them."
To see something, in other words, is to face the prospect of becoming inured to it, even if only slightly. Photographs reveal horrors to which they also accustom viewers. That was the ultimate problem with "Controversies." The show squandered our mercy for a rambling survey.
It violated the civil contract. Even that image of the starving Sudanese child becomes a little easier to bear. Not much easier, maybe, but just enough to recall Cartier-Bresson's word, barbaric. He was talking about portraits and street scenes, not pictures of incomprehensible suffering. But the same emotional transactions apply.
It's not just the perpetrators' barbarism but ours that photographs like these expose.

http://www.nytimes.com/2009/06/04/arts/design/04abroad.html?ref=design

Women Bridging Gap in Science Opportunities

By CORNELIA DEAN

The prospects for women who are scientists and engineers at major research universities have improved, although women continue to face inequalities in salary and access to some other resources, a panel of the National Research Council concludes in a new report.

In recent years "men and women faculty in science, engineering and mathematics have enjoyed comparable opportunities," the panel said in its report, released on Tuesday. It found that women who apply for university jobs and, once they have them, for promotion and tenure, are at least as likely to succeed as men. But compared with their numbers among new Ph.D.'s, women are still underrepresented in applicant pools, a puzzle that offers an opportunity for further research, the panel said.
The panel said one factor outshined all others in encouraging women to apply for jobs: having women on the committees appointed to fill them.
In another report this week in the Proceedings of the National Academy of Sciences, researchers at the University of Wisconsin reviewed a variety of studies and concluded that the achievement gap between boys and girls in mathematics performance had narrowed to the vanishing point.
"U.S. girls have now reached parity with boys, even in high school and even for measures requiring complex problem solving," the Wisconsin researchers said. Although girls are still underrepresented in the ranks of young math prodigies, they said, that gap is narrowing, which undermines claims that a greater prevalence of profound mathematical talent in males is biologically determined. The researchers said this and other phenomena "provide abundant evidence for the impact of sociocultural and other environmental factors on the development of mathematical skills and talent and the size, if any, of math gender gaps."
The research council, an arm of the National Academy of Sciences, convened its expert panel at the request of Congress. The panel surveyed six disciplines — biology, chemistry, mathematics, civil and electrical engineering and physics — and based its analysis on interviews with faculty members at 89 institutions and data from federal agencies, professional societies and other sources.
The panel was led by Claude Canizares, a physicist who is vice president for research at M.I.T., and Dr. Sally Shaywitz of Yale Medical School, an expert on learning.
The Wisconsin researchers, Janet S. Hyde and Janet E. Mertz, studied data from 10 states collected in tests mandated by the No Child Left Behind legislation as well as data from the National Assessment of Educational Progress, a federal testing program. Differences between girls' and boys' performance in the 10 states were "close to zero in all grades," they said, even in high schools were gaps existed earlier. In the national assessment, they said, differences between girls' and boys' performance were "trivial."

http://www.nytimes.com/2009/06/03/science/03discrim.html?ref=science

Analysis Finds Elevated Risk From Soot Particles in the Air

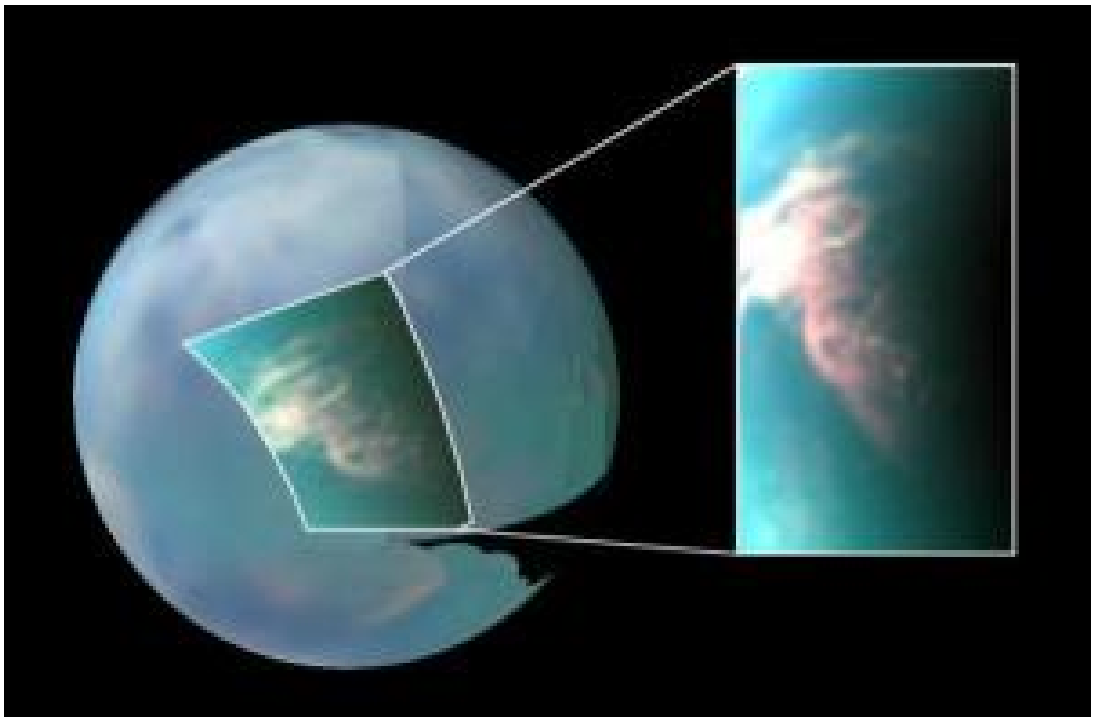
By FELICITY BARRINGER

A new appraisal of existing studies documenting the links between tiny soot particles and premature death from cardiovascular ailments shows that mortality rates among people exposed to the particles are twice as high as previously thought.

Dan Greenbaum, the president of the nonprofit Health Effects Institute, which is releasing the analysis on Wednesday, said that the areas covered in the study included 116 American cities, with the highest levels of soot particles found in areas including the eastern suburbs of Los Angeles and the Central Valley of California; Birmingham, Ala.; Atlanta; the Ohio River Valley; and Pittsburgh.
The review found that the risk of having a condition that is a precursor to deadly heart attacks for people living in soot-laden areas goes up by 24 percent rather than 12 percent, as particle concentrations increase.
A variety of sources produce fine particles, and they include diesel engines, automobile tires, coal-fired power plants and oil refineries.
Comparing exposure within the New York and the Los Angeles metropolitan areas, the study found that the risks were evenly distributed in the vicinity of New York while some areas around Los Angeles, including neighborhoods near the Ports of Los Angeles and Long Beach, had elevated health risks.
The extended epidemiological analysis, which draws on data gathered from 350,000 people over 18 years, and an additional 150,000 people in more recent years, was conducted for the Health Effects Institute by scientists at the University of Ottawa.
The institute was created by the Environmental Protection Agency and the industries that it regulates with the goal of obtaining unbiased studies.
The link between fine particles, the diameter of which is smaller than a 30th of a human hair, and cardiopulmonary disease has been established for two decades, and the E.P.A. has regulated such emissions since 1997. In 2006, despite mounting evidence that the particles were deadlier than first thought, the agency declined to lower chronic exposure limits.
The United States Court of Appeals for the District of Columbia Circuit declared that decision inadequate, and the Obama administration is now considering what level is appropriate.

http://www.nytimes.com/2009/06/03/science/earth/03soot.html?ref=science

Saturn's Moon Titan: Cassini Finds Titan's Clouds Hang On To Summer



This infrared image of Saturn's moon Titan shows a large burst of clouds in the moon's south polar region. (Credit: NASA/JPL/University of Arizona/University of Nantes)

ScienceDaily (June 4, 2009) — Cloud chasers studying Saturn's moon Titan say its clouds form and move much like those on Earth, but in a much slower, more lingering fashion.

Their forecast for Titan's early autumn -- warm and wetter.

Scientists with NASA's Cassini mission have monitored Titan's atmosphere for three-and-a-half years, between July 2004 and December 2007, and observed more than 200 clouds. They found that the way these clouds are distributed around Titan matches scientists' global circulation models. The only exception is timing -- clouds are still noticeable in the southern hemisphere while fall is approaching.

"Titan's clouds don't move with the seasons exactly as we expected," said Sebastien Rodriguez of the University of Paris Diderot, in collaboration with Cassini visual and infrared mapping spectrometer team members at the University of Nantes, France. "We see lots of clouds during the summer in the southern hemisphere, and this summer weather seems to last into the early fall. It looks like Indian summer on Earth, even if the mechanisms are radically different on Titan from those on Earth. Titan may then experience a warmer and wetter early autumn than forecasted by the models."

On Earth, abnormally warm, dry weather periods in late autumn occur when low-pressure systems are blocked in the winter hemisphere. By contrast, scientists think the sluggishness of temperature changes at the surface and low atmosphere on Titan may be responsible for its unexpected warm and wet, hence cloudy, late summer.

As summer changes to fall at the equinox in August 2009, Titan's clouds are expected to disappear altogether. But, circulation models of Titan's weather and climate predict that clouds at the southern latitudes don't wait for the equinox and should have already faded out since 2005. However, Cassini was still able to see clouds at these places late in 2007, and some of them are particularly active at mid-latitudes and the equator.

Titan is the only moon in our solar system with a substantial atmosphere, and its climate shares Earth-like characteristics. Titan's dense, nitrogen-methane atmosphere responds much more slowly than Earth's atmosphere, as it receives about 100 times less sunlight because it is 10 times farther from the sun. Seasons on Titan last more than seven Earth years.

Scientists will continue to observe the long-term changes during Cassini's extended mission, which runs until the fall of 2010. Cassini is set to fly by Titan on May 6.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Cassini-Huygens mission for NASA's Science Mission Directorate. The Cassini orbiter was designed, developed and assembled at JPL. The visual and infrared mapping spectrometer team is based at the University of Arizona.

Adapted from materials provided by NASA/Jet Propulsion Laboratory.

http://www.sciencedaily.com/releases/2009/06/090603181402.htm

Obesity Does Not Worsen Asthma, But May Reduce Response To Medications

ScienceDaily (June 4, 2009) — Being overweight or obese does not make asthma worse in patients with mild and moderate forms of the disease, according to a study by National Jewish Health researchers, although it may reduce the response to medications.

"With both asthma and obesity on the rise in recent years, there has been much interest in the possible link between these two conditions," said lead author E. Rand Sutherland, Associate Professor of Medicine at National Jewish Health, and lead author of the paper appearing in the June 2009 issue of the *Journal of Allergy and Clinical Immunology.*

"By studying a well characterized group of patients with asthma, we were able to determine that increased weight is not associated with more severe asthma. Although benefits can be obtained with weight loss in other diseases, these findings suggest that an improvement in asthma may not necessarily result from weight loss.

"The findings also suggest that patients and physicians should be aware that obese asthma patients may not respond well to corticosteroids, the most successful controller medication for asthma, which can affect dosing decisions and choices of possible alternatives to steroids."

Previous studies have suggested that obesity predisposes people to developing asthma, to suffer more severe asthma symptoms, and to respond less to medications. However, the exact mechanism for these links has been unclear, and the studies have generally relied upon patients' reports of their diagnosis and symptoms rather than using more precise tools to characterize patients.

Dr. Sutherland and his colleagues decided to examine the issue in a well characterized group of 1,256 patients who had participated in NIH-sponsored studies. They divided them into patients with a body mass index of less than 25 (lean) and greater than or equal to 25 (overweight and obese). They found that lean asthma patients had slightly greater forced expiratory volume in one second , or FEV1 (3.05 liters vs 2.91 liters), and slightly greater ratio of FEV1 to forced vital capacity (83.5% vs. 82.4%), both common measures of lung function. They also found slightly greater use of rescue inhalers among overweight patients (1.2 puffs per day vs. 1.1 puffs per day) and slightly higher scores asthma-relate quality of life questionnaires (5.77 vs. 5.59).

"These differences were small and are unlikely to be of any real clinical significance," said Dr. Sutherland.

Response to medications, however, did show an effect of increased weight. Among a subgroup of 183 people, lean patients taking inhaled corticosteroids alone showed a 55% greater reduction in exhaled nitric oxide, a measure of inflammation. Lean patients taking a combination inhaled steroid and long-acting beta agonist increased their FEV1 by 80 more milliliters. There were no differences, however, between these patients in the number of asthma exacerbations.

"The data suggest overweight and obese people respond less well to controller medications for asthma than do their lean counterparts," said Dr. Sutherland. "These data come from already-completed studies designed to answer other questions, however, and ongoing studies are being conducted to more definitively determine the effect of increased weight on treatment response in asthma."

Adapted from materials provided by National Jewish Medical and Research Center.

http://www.sciencedaily.com/releases/2009/06/090603091040.htm

All The Carbon Counts: Including Land-based Carbon In Greenhouse Gas Control Strategies Lowers Costs And Preserves Forests

Policies that turn forests into valuable carbon storage units would likely preserve forests and lower costs of cutting atmospheric carbon dioxide. (Credit: Image courtesy of DOE/Pacific Northwest National Laboratory)

ScienceDaily (June 4, 2009) — Cutting down forests for agriculture vents excess carbon dioxide into the air just as industrial activities and the burning of fossil fuels do. But whether policies to stabilize greenhouse gases in the atmosphere should include this terrestrial source of carbon dioxide is under debate.

According to a new study this week in *Science*, failing to include land use changes in such policies could lead to massive deforestation and higher costs for limiting carbon emissions.

The results also suggest improved agricultural technology will be as important as new energy technologies in a carbon-limited future.

To understand the effects of economic forces from climate policy on terrestrial carbon and land use changes, researchers with the Joint Global Change Research Institute in College Park, Md., a collaboration between the Department of Energy's Pacific Northwest National Laboratory and the University of Maryland, used an integrated assessment model called MiniCAM to compare different scenarios. This computer model incorporates economics, energy, agriculture, land-use changes, emissions and concentrations of greenhouse gases in order to understand the way that human decisions interact with natural processes that control climate.

For this study, the researchers set the highest concentration that carbon dioxide could reach. Then they compared two ways to stay within that limit: in one, they taxed terrestrial carbon emissions and industrial and fossil fuel emissions all at the same rate. In the other, they only taxed emissions from industry and fossil fuels.

Ignoring terrestrial carbon led to nearly complete loss of unmanaged forests by 2100, largely as a result of massive expansions of bioenergy crops -- those planted to reduce the use of fossil fuels -- replacing forests. However, placing a value on terrestrial carbon emissions led to increased forest cover, while bioenergy still expanded considerably compared to today.

"When society tries to limit carbon dioxide concentrations, if terrestrial carbon emissions aren't valued but fossil fuel and industrial emissions are, economic forces could create very strong pressures to deforest," said PNNL scientist Marshall Wise, the study leader.

In addition, the cost to reduce global emissions in a world that valued terrestrial, fossil fuel, and industrial sources dropped to half that of the world in which only fossil fuel and industrial entities paid to emit carbon. This suggests that storing carbon in forests, agricultural areas, and other ecosystems is an important and cost-effective part of a bigger carbon dioxide emissions control strategy that includes dramatic changes to the global energy system.

This study also shows that continual improvement in agricultural crop productivity for crops like corn, wheat, barley, and rice will be required to best make use of limited cropland. This suggests improvements to agriculture technology could be as important as improvements to energy technology in controlling carbon emissions.

"If society wants to stabilize carbon dioxide concentrations at low levels, then we can't ignore the two thousand billion tons that are out there in terrestrial systems," said PNNL economist James Edmonds at the JGCRI.

This research was supported by the Office of Biological and Environmental Research within the Department of Energy's Office of Science, and the Electric Power Research Institute.

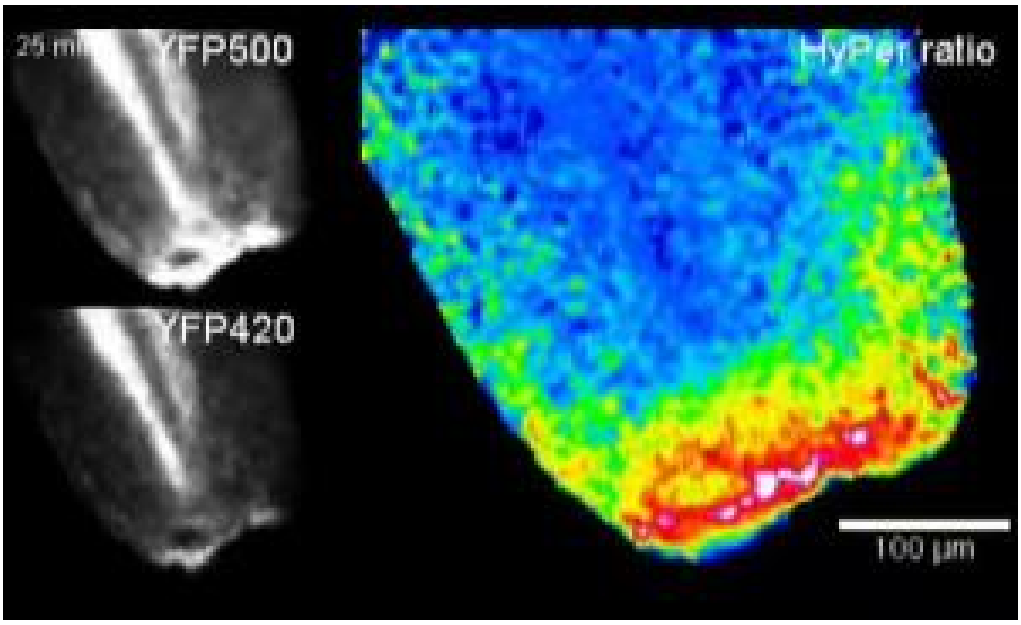
Journal reference:

1. M. Wise, K. Calvin, A. Thomson, L. Clarke, B. Bond-Lamberty, R. Sands, S. J. Smith, A. Janetos, J. Edmonds. **Implications of Limiting CO_2 Concentrations on Land Use and Energy**. *Science*, 2009; DOI: 10.1126/science.1168475

Adapted from materials provided by DOE/Pacific Northwest National Laboratory.

http://www.sciencedaily.com/releases/2009/05/090528142817.htm

Hydrogen Peroxide Marshals Immune System



In the zebrafish tail fin imaged here, a small wound is inflicted at the tip of the fin. Red represents high concentrations of hydrogen peroxide, and blue represents low concentrations. The chemical burst far exceeds the single cell diameter and reaches well into the surrounding tissue. (Credit: Philipp Niethammer)

ScienceDaily (June 4, 2009) — When you were a kid your mom poured it on your scraped finger to stave off infection. When you got older you might have even used it to bleach your hair. Now there's another possible function for this over-the-counter colorless liquid: your body might be using hydrogen peroxide as an envoy that marshals troops of healing cells to wounded tissue.

Using the zebrafish as an animal model, researchers in the lab of Harvard Medical School professor of systems biology Timothy Mitchison and Dana Farber Cancer Institute professor Thomas Look have discovered that when the tail fins of these creatures are injured, a burst of hydrogen peroxide is released from the wound and into the surrounding tissue. Teams of rescue-working white blood cells respond to this chemical herald, crawl to the site of damage, and get to work.

"We've known for quite some time that when the body is wounded, white blood cells show up, and it's really a spectacular piece of biology because these cells detect the wound at some distance," says Mitchison. "But we haven't known what they're responding to. We do know something about what summons white blood cells to areas that are chronically inflamed, but in the case of an isolated physical wound, we haven't really known what the signal is."

These findings are reported in the June 4 issue of the journal *Nature*.

Philipp Niethammer, a postdoc in Mitchison's lab, and Clemmens Grabber, a postdoc in Look's lab, initiated this research project with no interest in wound healing. Rather, they were studying a groups of molecules called reactive oxygen species, or ROS. These small oxygen-derived molecules, of which hydrogen peroxide is one, have the potential to be both helpful and hurtful. Niethammer and Grabber were simply curious to find ways to detect ROS molecules in an organism.

To do this, they took a gene engineered to change color in the presence of hydrogen peroxide and inserted it into zebrafish embryos. Once the embryos entered the larvae stage after a few days, this synthetic gene

spread throughout the entire body, essentially "wiring" the fish so that any discreet location in which hydrogen peroxide appears would glow.

But how do you coax the fish to produce a reactive chemical like hydrogen peroxide in the first place?

Since white blood cells have long been known to produce hydrogen peroxide, one obvious way to initiate chemical production would be to inflict a small wound onto the fish, and then, using microscopy, observe patterns of this chemical as white blood cells gathered around the wound. But much to the researchers surprise, they found that hydrogen peroxide immediately appeared at the wound site, prior to the arrival of any white blood cell, and quickly disseminated into neighboring tissue.

They repeated the experiment, this time in zebrafish where they'd disabled a protein that was previously discovered to produce hydrogen peroxide in the human thyroid gland. Not only did hydrogen peroxide not appear at the wound site, but white blood cells failed to respond to the injury.

"This was our real eureka! moment," says Niethammer. "We weren't too surprised that we could block hydrogen peroxide production through this technique, but what we didn't expect at all was that white blood cells wouldn't respond. This proved that the white blood cells needed hydrogen peroxide to sense the wound, and move towards it."

Of course, zebrafish are not people, and while our genomes share many similarities with these tiny fish, it isn't yet clear that natural selection has conserved this process throughout the evolutionary family tree. Still, these findings offer something of a conceptual shift in how to view human conditions where hydrogen peroxide plays a role. "When we look at how hydrogen peroxide works in people, this really starts getting intriguing," says Mitchison.

In the human body, hydrogen peroxide is produced primarily in three places: lung, gut, and thyroid gland. Because hydrogen peroxide, and the proteins responsible for producing other ROS molecules, are especially present in lung and gut, the researchers hypothesize that human diseases relevant to these findings would include any in the lung and gut that involve disproportionate levels of white blood cells, like asthma, chronic pulmonary obstruction, and some inflammatory gut diseases.

"Our lungs are supposed to be sterile; our guts are anything but," says Mitchison. "It's very logical that both those tissues produce hydrogen peroxide all the time. Perhaps in conditions like asthma, the lung epithelia is producing too much hydrogen peroxide because it's chronically irritated, which, if our findings translate to humans, would explain inappropriate levels of white blood cells. This is certainly a question worth pursuing."

Mitchison is currently laying the groundwork for investigating this hypothesis.

This research was funded by the National Institutes of Health.

Journal reference:

1. Philipp Niethammer, Clemens Grabher, A. Thomas Look, Timothy J. Mitchison. **A tissue-scale gradient of hydrogen peroxide mediates rapid wound detection in zebrafish**. *Nature*, 2009; 459 (7247) DOI: 10.1038/nature08119

Adapted from materials provided by Harvard Medical School.

http://www.sciencedaily.com/releases/2009/06/090603131431.htm

Postwar Food Vecht Is An Important Source Of Antioxidant Activity

Vetch. This leguminous plant of the Fabeae family was very popular during the Spanish post-war as a basic foodstuff. (Credit: Image courtesy of Andalucía Innova)

ScienceDaily (June 4, 2009) — Researchers of Instituto de la Grasa (part of the Spanish National Research Council -CSIC) and the Vegetal Biology and Ecology Department of the University of Seville have found out that vetch is an important source of phenolic compounds with a high antioxidant activity. It is a leguminous plant of the Fabeae family, very popular during the Spanish post-war as a basic foodstuff. Currently, vetch is frequently grown in the Indian subcontinent, in Ethiopia and surrounding countries, in the Mediterranean area and in South America.

This finding is paradoxical because its excessive consumption causes lathyrism, a disease of the spinal cord. It has been published in the Food Science and Technology of the Swiss Society of Food Science and Technology journal. For researchers, these results could open a door to future alternative growings.

Polyphenols are antioxidants that protect LDL's from oxidation. They are absorbed in our body and appear in our blood and tissues through fruits, vegetables and wine. Its consumption causes an increase of the antioxidant capacity in the blood, which prevents oxidative stress, linked to diseases and the ageing process.

Researchers studied the content in polyphenols and the antioxidant activity of the seeds of 15 species of *Lathyrus in Andalusia: L. hirsutus, L. filiformis, L. sativus, L. cicera, L. angulatus, L. sphaericus, L. annuus L. clymenum, L. pratensis, L. ochrus, L. aphaca, L. latifolius, L. setifolius, L. tingitanus and L. amphicarpos.* In this research work, scientists noticed different proportions in the contents of the seeds polyphenols, which fluctuated between 3.8 mg/g of flour in *L. setifolius* and 29.2 mg/g in the case of *L. sphaericus*. Moreover there were higher contents of polyphenols in the smallest seeds due to a higher amount of husk, which is richer in these compounds.

The contents of polyphenols in the studied wild vetch were much higher to those observed in widely consumed pulses. For example, species such as *L. aphaca, L. tingitanus, L. angulatus and L. spahericus* showed more than double amount of phenolic compounds than soy, chickpeas and lupines.

Moreover, in addition to having a higher content of polyphenols, many species of vetch showed in these compounds more than double of the antioxidant activity soy, chickpeas and lupines polyphenols had. Therefore, three grown species of vetch, *L. sativus, L. cicera* and *L. annuus* had polyphenols with a higher antioxidant activity.

'These results can open the door to reconsider and revaluate these traditional growings in our community as a functional source of food or compounds with a high biological activity such as polyphenols. This could help to the revaluation of these growings, preservation of these species, protection of our floral richness and finally, the protection of biodiversity', Javier Vioque stated.

L. sativus is the vetch variety that is most used in human food as a pulse or else without the husk and turned into flour to mix it with cereals and make bread or porridge. Porridge was a popular dish in times of poverty and famine such as the Spanish post-war, in Castile-La Mancha and Extremadura. However, the presence of toxic compounds in seeds can result in serious cases of paralysis, known as neurolathyrism, though this only occurs when it is an important part of the diet (more than 30% of the total) for several weeks or months.

Polyphenols are compounds with a well known biological activity. There are plenty of them in vegetables and the beneficial effects pf wine, soy and olive oil polyphenols have been very much researched into. They have antioxidant, anti-inflammatory and anti-proliferate properties, and they are recommended for the prevention of circulatory system diseases and cancer, and in general, to delay the ageing process.

Journal reference:

1. Pastorcavada et al. **Antioxidant activity of seed polyphenols in fifteen wild Lathyrus species from South Spain**. *LWT - Food Science and Technology*, 2009; 42 (3): 705 DOI: 10.1016/j.lwt.2008.10.006

Adapted from materials provided by Andalucía Innova, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/05/090528092528.htm

Materials Science: Metals With Diamonds

ScienceDaily (June 4, 2009) — Material scientists are developing composites which are made of dissimilar materials in order to be able to offer new customised application profiles.

Researchers at the Vienna University of Technology (TU) have examined promising metal-matrix composites, which are very good conductors of heat and are able to withstand mechanical loads at elevated temperatures of up to 550 degrees and expand only very little with increasing temperature. These material combinations may be used in the ITER nuclear reactor, which is currently being constructed at Cadarache, France, and where they are intended to be used in cooling the first wall of the experimental reactor.

Enhanced heat removal is playing an increasingly important role in the field of power electronics for engines and computers. Unless excess heat can be dissipated, the power of computers can no longer be increased. Last but not least, metal matrix composites can be used as cooling materials in rocket engines.

Four TU institutes are working on material combinations as part of an EU project of the 6th Framework Programme called ExtreMat (http://www.extremat.org/), which stands for "New Materials for Extreme Environments". "We examined some metal matrix composites and their interfacial bonding which are promising for use in nuclear reactor heat sinks, rocket engines or in power electronics. The characterisation of these heterogeneous materials falls within our area of competency," says Professor H. Peter Degischer, Head of the Institute of Materials Science and Material Technology at the TU Vienna. "Copper and silver are efficient conductors, but due to their relatively high coefficient of thermal expansion, do not provide enough inherent strength when changes in temperature occur. In addition, their mechanical strength is sharply reduced at elevated temperatures. Copper deforms like butter from 300 degrees onwards."

Strengthening with silicon carbide or tungsten fibres with some 0.1 millimetres or carbon fibres with less than 1/100 millimetres diameter increases the strength and the form stability without reducing conductivity. Degischer believes that a combination of silver with diamond particles of approx. 0.1 millimetres of diameter which are connected by means of thin silicon bridges holds the most promise for power electronics.

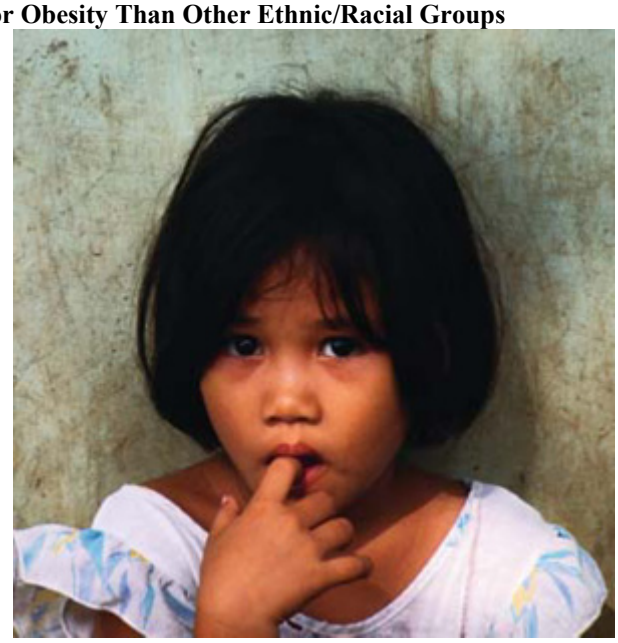
By using simulation calculations, both the internal stresses and the thermal conductivity were predicted for given internal arrangements of composites. The Austrian company PLANSEE could set up industrial production for these new materials. "During our investigations with a synchrotron, a particularly brilliant X-ray source, in Grenoble we were able to see how the composites' components, which are arranged three-dimensionally, deformed in different ways upon being repeatedly heated up and cooled down. Furthermore, we were able to ascertain the point at which debonds on the interface between metal matrix and diamond particles become visible in micro-tomography. These debonds are a consequence of local tensile stresses during changes in temperature. The conducting bond to the cooling plate was produced using a new coating procedure," says Degischer.

Chemists (Ass. Prof. C. Edtmaier), physicists (Prof. C. Eisenmenger-Sittner), micro-mechanicists (Prof. H. Böhm) and material scientists from the TU collaborated with two Austrian partners and 35 other European research institutes and companies on the research project "ExtreMat". Four doctoral students successfully carried out the scientific work for the project part on behalf of the TU. Almost 1 million euro has been spent on the project over the past 4 years, 50 percent of which was financed by the European Commission.

Adapted from materials provided by Vienna University of Technology, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/05/090527110139.htm

Hispanic Children In U.S. At Greater Risk For Obesity Than Other Ethnic/Racial Groups



ScienceDaily (June 4, 2009) — The prevalence of overweight in the US population is among the highest in Mexican-American children and adolescents. In a study of 1,030 Hispanic children between the ages of 4 and 19, published in the June 2009 issue of the *Journal of the American Dietetic Association*, researchers from the Baylor College of Medicine found less than optimal diets in both overweight and non-overweight participants.

According to the National Health and Nutrition Examination Surveys (NHANES), in 2005-2006 the prevalence of overweight among children (2-19 years) from all ethnic/racial groups was 15.5%. For Mexican-American males and females (2-19 years) the prevalence was 23.2% and 18.5%, respectively. Although the US environment encourages a sedentary lifestyle and excess food intake, the Hispanic population is burdened with additional risk factors for childhood obesity including parental obesity, low socioeconomic status (SES), recent immigration, acculturation to US diet and lifestyle, and limited health insurance coverage.

The VIVA LA FAMILIA Study was designed to identify genetic and environmental factors contributing to childhood obesity in the Hispanic population. It provided the novel opportunity to assess the diet of a large cohort of Hispanic children from low-SES families at high risk for obesity (1,030 children from 319 families in Houston, Texas). On average, 91% of parents were overweight or obese and parental income and education levels were low. Food insecurity was reported by 49% of households.

Writing in the article, Nancy F. Butte, PhD, Professor, USDA/ARS Children's Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine, states, “The diets of these low-SES Hispanic children were adequate in most essential nutrients, but suboptimal for the promotion of long-term health. Diet quality did not satisfy US dietary guidelines for fat, cholesterol, saturated fatty acids, fiber, added sugar, and sodium. Although energy intake was higher in overweight children, food sources, diet quality, and macro- and micronutrient composition were similar between non-overweight and overweight siblings...Knowledge of the dietary intake of children from low-SES Hispanic families at high risk for obesity will provide a basis on which to build nutritional interventions and policy that are appropriately tailored to population sub-groups.”

In a commentary published in the same issue of the Journal of the American Dietetic Association, Rafael Pérez-Escamilla, PhD, Professor of Nutritional Sciences & Public Health, Director, NIH EXPORT Center for Eliminating, Health Disparities among Latinos (CEHDL), University of Connecticut, Storrs, asks

whether the process of acculturation into "mainstream" US society is having negative effects on Hispanics. Citing numerous studies, he explores many of the factors that both support and contradict the assimilation argument, and concludes that while acculturation is likely a negative influence, further study is warranted. He writes, "However, we still need to elucidate the mechanisms and the extent to which acculturation to the USA 'mainstream' culture per se explain deterioration in dietary quality, and increased risks for obesity and associated chronic diseases among Latinos. Filling in this gap in knowledge is essential for developing culturally appropriate and behavioral change based interventions targeting Latinos with different levels of acculturation."

The article is "Nutrient adequacy and diet quality in non-overweight and overweight Hispanic children of low socioeconomic status - the VIVA LA FAMILIA Study" by Theresa A. Wilson, MS, RD, Anne L. Adolph, BS, and Nancy F. Butte, PhD. The commentary is "Dietary quality among Latinos: Is acculturation making us sick?" by Rafael Pérez-Escamilla, PhD. Both appear in the Journal of the American Dietetic Association, Volume 109, Issue 6 (June 2009) published by Elsevier.

Journal references:

1. Theresa A. Wilson, Anne L. Adolph, Nancy F. Butte. **Nutrient Adequacy and Diet Quality in Non-Overweight and Overweight Hispanic Children of Low Socioeconomic Status: The Viva la Familia Study**. *Journal of the American Dietetic Association*, 2009; 109 (6): 1012 DOI: 10.1016/j.jada.2009.03.007
2. Rafael Pérez-Escamilla. **Dietary Quality among Latinos: Is Acculturation Making Us Sick?** *Journal of the American Dietetic Association*, 2009; 109 (6): 988 DOI: 10.1016/j.jada.2009.03.014

Adapted from materials provided by Elsevier, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/06/090601085920.htm

Bird Flu Virus Remains Infectious Up To 600 Days In Municipal Landfills

ScienceDaily (June 3, 2009) — Amid concerns about a pandemic of swine flu, researchers from Nebraska report for the first time that poultry carcasses infected with another threat — the "bird flu" virus — can remain infectious in municipal landfills for almost 2 years.

Shannon L. Bartelt-Hunt and colleagues note that avian influenza, specifically the H5N1 strain, is an ongoing public health concern. Hundreds of millions of chickens and ducks infected with the virus have died or been culled from flocks worldwide in efforts to control the disease. More than 4 million poultry died or were culled in a 2002 outbreak in Virginia, and the carcasses were disposed of in municipal landfills. Until now, few studies have directly assessed the safety of landfill disposal.

"The objectives of this study were to assess the survival of avian influenza in landfill leachate and the influence of environmental factors," says the report. The data showed that the virus survived in landfill leachate — liquid that drains or "leaches" from a landfill — for at least 30 days and up to 600 days. The two factors that most reduced influenza survival times were elevated temperature and acidic or alkaline pH. "Data obtained from this study indicate that landfilling is an appropriate method for disposal of carcasses infected with avian influenza," says the study, noting that landfills are designed to hold material for much longer periods of time.

Journal reference:

1. Graiver et al. **Survival of the Avian Influenza Virus (H6N2) After Land Disposal**. *Environmental Science & Technology*, 2009; 43 (11): 4063 DOI: 10.1021/es900370x

Adapted from materials provided by American Chemical Society.

http://www.sciencedaily.com/releases/2009/06/090601110251.htm

Predicting Droughts With Greater Certainty

The city of Stratford in Texas is engulfed by a dust storm on 18 April 1935. A common event during the "Dust Bowl" drought. (Credit: NOAA George E. Marsh Album)

ScienceDaily (June 3, 2009) — Using new data and reconstructions of the "Dust Bowl" drought in America during the 1930s, climatologists at the ETH have shown for the first time a three-dimensional picture of the atmospheric circulation that led to the drought. This will enable climate models to be evaluated and further improved. The scientists hope this work will make it possible to predict future periods of drought more accurately.

In the 1930s, a drought that lasted almost ten years wrought havoc on the Midwest region of North America. The enormous dust storms accompanying it gave the "Dust Bowl" drought its name. This drought had devastating socio-economic consequences for America. John Steinbeck immortalised the tragic story of farmers already impoverished by the economic crisis of the time in his novel "The Grapes of Wrath". And the legendary "Route 66", along which the farmers fled towards California, was made famous in part by the Dust Bowl.

Digitalised historical data improve model

Scientists have been studying the Dust Bowl phenomenon for decades, and until now the mechanisms that caused this exceptionally long period of drought have not been fully understood, as little information has been available on the atmospheric circulation. Stefan Brönnimann, Professor at the Institute for Atmospheric and Climate Science at ETH Zurich, and his team have now used historical data to reconstruct and analyse the three-dimensional circulation during the Dust Bowl drought. At the time of the drought, wind and temperature readings were already being taken using balloons and aircraft, initially at altitudes of three to eight kilometres, and later at much higher altitudes. These data have now been digitalised as part of a US project and a project undertaken by the Swiss National Science Foundation. Based on these data, Brönnimann's team used statistical methods to reconstruct the upper air circulation at an altitude of up to 15 kilometres.

Based on computer models, researchers have up to now conjectured that unusual sea surface temperatures in the Pacific and Atlantic Oceans would have altered the wind systems, thereby triggering the drought. At the same time, the dying vegetation, the parched soil and the dust created by these conditions could have further intensified the drought. However, according to Brönnimann, observations to date have offered insufficient confirmation of these hypotheses based on simulated models.

Exceptionally cold Pacific

In their study, the scientists focused on three known circulation patterns which characterise the basic wind conditions of the region and the wider area. Using the new data, they were able to show that a specific wind flow, the Great Plains Low-Level Jet, was shallower at the time of the Dust Bowl. This air current usually carries moist air from the tropical Atlantic far into the region, which covers approximately two million square kilometres. In addition, the Jet did not penetrate as far north as usual, as it was deflected too early towards the east.

The researchers believe this was caused by a high-pressure system that built up over the Plains and was associated with an abnormal upper air flow extending from the Pacific across North America to the Atlantic. “Overall, these features are clearly consistent with the flow conditions that climate models predict as the effect of a cold Pacific coinciding with a warm Atlantic”, explains Brönnimann. Because the temperatures of the tropical oceans can to a certain degree be predicted, the scientists see here the possibility of predicting periods of drought as well. However, the study also shows up some remaining shortcomings in the models: for the most part, they would not correctly depict the spatial shift of the Low-Level Jet, and in many models the drought is located too far to the south.

Journal reference:

1. Brönnimann et al. **Exceptional atmospheric circulation during the 'Dust Bowl'**. *Geophysical Research Letters*, 2009; 36 (8): L08802 DOI: 10.1029/2009GL037612

Adapted from materials provided by ETH Zurich.

http://www.sciencedaily.com/releases/2009/05/090530172427.htm

Secret Of Sandcastle Construction Could Help Revive Ancient Building Technique, Researchers Say

The monastery in Kagbeni, in the Buddhist kingdom of Mustang, Nepal. The monastery was established in 1429. (Credit: Copyright Paul Jaquin/Durham University)

ScienceDaily (June 3, 2009) — The secret of a successful sandcastle could aid the revival of an ancient eco-friendly building technique, according to research led by Durham University.

Researchers, led by experts at Durham's School of Engineering, have carried out a study into the strength of rammed earth, which is growing in popularity as a sustainable building method.

Just as a sandcastle needs a little water to stand up, the Durham engineers found that the strength of rammed earth was heavily dependent on its water content.Rammed earth is a manufactured material made up of sand, gravel and clay which is moistened and then compacted between forms to build walls. Sometimes stabilisers such as cement are added but the Durham research focussed on unstabilised materials.

The research, funded by the Engineering and Physical Sciences Research Council (EPSRC) and published in the journal *Geotechnique*, showed that a major component of the strength of rammed earth was due to the small amount of water present.Small cylindrical samples of rammed earth underwent "triaxial testing" – where external pressures are applied to model behaviour of the material in a wall. The researchers found that the suction created between soil particles at very low water contents was a source of strength in unstabilised rammed earth.

They showed that rammed earth walls left to dry after construction, in a suitable climate, could be expected to dry but not lose all their water. The small amount of water remaining provided considerable strength over time.The researchers say their work could have implications for the future design of buildings using rammed earth as the link between strength and water content becomes clearer.

There is increasing interest in using the technique as it may help reduce reliance on cement in building materials (cement production being responsible for five per cent of man's CO2 output (1)). Rammed earth materials can usually also be sourced locally, thereby reducing transport needs.

As well as informing new build designs the team hopes their findings could also aid the conservation of ancient rammed earth buildings by putting methods in place to protect against too much water entering a structure, which would reduce its strength. Paul Jaquin, a researcher on the project is now working for an engineering consultancy (Ramboll, UK) on new earth building projects around the world, using this research to better engineer buildings.

Research project leader, Dr Charles Augarde, of Durham University's School of Engineering, said: "We know that rammed earth can stand the test of time but the source of its strength has not been understood properly to date.

"Without this understanding we cannot effectively conserve old rammed earth or make economic designs for new build. "Our initial tests point to its main source of strength being linked to its water content.

"By understanding more about this we can begin to look at the implications for using rammed earth as a green material in the design of new buildings and in the conservation of ancient buildings that were constructed using the technique."

Rammed earth was developed in ancient China around 2,000 years before Christ, when people used the technique to build walls around their settlements and the technique spread throughout the world - as documented in another recent publication by the researchers linking up with Dr Chris Gerrard, of the Department of Archaeology, at Durham University (*).

Parts of the Great Wall of China and the Alhambra at Granada in Spain were built using rammed earth.

In the UK the technique was used to build experimental low cost housing, in Amesbury, Wiltshire, following the end of the First World War, and it is a recognised building method in parts of Australia and the USA.

The popularity of eco-friendly homes showcased on television programmes such as Grand Designs has also brought the technique to people's attention.

Dr Augarde is a co-director of Earth Building UK (EBUK), a new association established this year to foster the conservation, understanding and development of building with earth in the United Kingdom.

EBUK brings together builders, academics, researchers, architects, engineers, manufacturers and many more to work in areas of common interest at a national and local level.

Tom Morton, Secretary of Earth Building UK, said: "This kind of research is very valuable as the construction industry analyses environmentally sound, traditional ways of building and adapts them for sustainable construction in the 21st century.

"Such low-carbon technologies are most likely to succeed by marrying the expertise of our research universities, such as Durham, with the commercial understanding of the wider industry and we are seeing a number of very exciting developments in this area.

Journal reference:

1. P.A. Jaquin, C.E. Augarde, D. Gallipoli, D.G. Toll. **The strength of unstabilised rammed earth materials**. *Géotechnique*, 2009; 0 (0): 090505015147034 DOI: 10.1680/geot.2007.00129

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http://www.sciencedaily.com/releases/2009/06/090602192559.htm