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For the Advanced in Age, Easy-to-Use Technology

By ERIC A. TAUB

IN the 1960s, baby boomers, like most young people, could not wait to leave home.

Today, those boomers are trying to figure out how to stay at home, even if they are past the age when their parents made the passage to senior living. Companies that have long profited from the transformation of the counterculture into the over-the-counter culture are creating products that they hope will help them do that.

Here is what you have to look forward to as you enter your 60s and 70s: deciphering conversations at cocktail parties becomes difficult; you cannot remember where you put your keys; and your grandchildren think you are a computer klutz.

Fortunately, technologies are appearing that can remedy some of these shortcomings, helping those in their 60s maintain their youthful self-images.

"The new market is old age," said Joseph F. Coughlin, director of the AgeLab at M.I.T. "Baby boomers provide a perpetually youthful market." They are, says Mr. Coughlin, himself a spry 47, "looking for technology to stay independent, engaged, well and vital."

As most of them have finished rearing their children and paying for their education, they also have a lot of money, said Mr. Coughlin, and they are looking to spend it on technology.

The companies that are successfully marketing new technologies to older people are not those that have created high-tech ways for seniors to open jars. Rather, they are the ones that have learned to create products that span generations, providing style and utility to a range of age groups.

An obvious success story is Apple; its iPod line is easy to use and stylish, and its appeal crosses generations. Apple retail stores are clean, sleek and inviting. Older people enjoy entering them because "the Apple stores make you feel smart," Mr. Coughlin said.

Similar trends are happening in the auto industry. In the 1990s, the inside joke at Ford was that the Lincoln Town Car appealed to people whose next car would be a hearse.

But those entering their golden years today are not looking for psychedelic-decorated walkers or plush mini-limos.

Automobile manufacturers have moved from creating cars for older people to creating cars that can cross generations.

Consumers with less-nimble fingers find the large knobs in Honda's boxy Element easy to manipulate. But Honda did not design them for the arthritis stricken, but for young people who drive while wearing ski gloves, said a Honda spokesman, Chris Martin. The Element's design, aimed at younger people, inadvertently attracted consumers across age groups.

An important future trend, said Eero Laansoo, a human factors engineer for Ford, will be the personalized car, which gives drivers the ability to change instrument fonts and colors to make gauges and dials easier to read.

The rash of accident avoidance technologies — like blind spot detection, lane departure warning and adaptive cruise control (which slows your vehicle down if you get too close to another car) — cross age boundaries in their appeal. Teenage drivers can use them, and they can also give confidence to aging drivers with declining motor skills.

Here are some current technology products created for aging consumers:

CELLPHONES As growth in the mobile phone market slows because most people have bought one, carriers are looking to expand it by focusing on the specific needs of older consumers.

The Jitterbug clamshell phone (www.jitterbug.com), made by Samsung ($147, not including a service plan), does not reveal itself as a phone for older people until it is opened, displaying oversize buttons and large type on the screen. One-touch buttons enable easy dialing of 911 and other emergency numbers. The carrier markets the phone to the elderly with ads that explain that consumers can either dial numbers or ask a Jitterbug operator to do it for them. The company says 30 percent chose an operator's help.

Phone numbers can be manually entered into the Jitterbug or the company can do it for consumers. Full text-messaging will be available next year.

Because the Jitterbug is sold as a phone for senior citizens, people who refuse to think of themselves as such may hesitate to use it, no matter how easy it is. The Pantech Breeze ($50 with contract), by AT&T, and the Coupe ($30 with contract), by Verizon, are a bit more subtle in that they look more like standard cellphones. They are simplified flip phones with somewhat large buttons, oversize type and three one-touch buttons for emergencies. The Breeze includes Bluetooth capability and a pedometer.

In October, Clarity (www.clarityproducts.com) will sell ClarityLife C900, which can amplify voices by 20 decibels. A hearing aid can also be plugged into the phone. A single red button can be pushed to call or text up to five numbers of one's choosing. The $270 cellphone can be used on the AT&T or T-Mobile networks.

AT HOME IRobot (www.irobot.com), the company that made a name for itself with its Roomba robot vacuum cleaner, has created the Looj, a robotic gutter cleaner. The device, which sells for $100 to $170 depending on features, saves a person the trouble of climbing a ladder repeatedly.

Later this year, iRobot will market the ConnectR, its "virtual visiting robot," which will allow people to remotely view and speak to others. With its activities managed from a Web site at a remote location, the robot can be told to travel around a house to make sure that its occupants are safe, to read a story to a child or to make sure the Roomba is busy cleaning floors.

The remote control can also be expanded to do some household tasks. Universal TV remotes from Logitech, Philips and Sony can also control room lighting and draw automated shades.

Reach, from Break Boundaries (www.breakboundaries.com), is an L.C.D. touch screen that not only controls electronic components, but also allows users to operate a phone, raise a hospital bed, open and close doors and blinds, and call a nurse.

TAKE YOUR MEDICINE Another problem of aging is forgetfulness. A number of automated pill dispensers that verbally alert users when to take their medication are available. From Timex, the Daily Medication Manager (www.timexhealthcare.com) holds medication and can alert a user to take dosages up to four times a day.

Med-Time, from the American Medical Alert Corporation (www.age-in-place.com), can be programmed to dispense as many as 15 pills, each up to 28 dosages a day. When the unit beeps, the user turns the device over to release the pills.

The simple moments of forgetfulness may not be able to be eliminated, but their effects can be mitigated.

For those who misplace items, the Loc8tor (www.loc8tor.com), starting at about $100, can find up to seven items. A small tag is attached to an object, which is then registered on the Loc8tor's main unit using radio frequency. When an item is misplaced up to 600 feet away, the user chooses the item from the list and a series of tones points the user in the correct direction.

Of course, if the main unit is lost, you may never find your keys. In which case, several lock manufacturers offer keyless home entry locks that use fingerprint recognition technology to open a door. Available from such companies as Kwikset and 1Touch, the units, which start at around $200, can authorize 50 or more users depending on the model.

If you can remember all 50 users, this may be one product you do not need yet.

http://www.nytimes.com/2008/08/28/arts/design/28yale.html?th&emc=th

Freeing Those Snapshots Trapped Inside the Cellphone

By BOB TEDESCHI

For most people, camera phones are the place where life's precious moments languish. Snap a photo of your tyke's first steps with your phone and chances are that shot will be entombed in your little gizmo until your baby has gray hair.

Which is O.K., as long as you plan on keeping your trusty Razr with you for the next half-century. (And really, how good could the shot have been on a camera phone?) But this is not a good thing for the wireless carriers, who know that data usage — mobile gaming, messaging and such — is a gold mine.

So it is not so surprising that the phone companies are urging us to buy devices and services meant to seamlessly move those pictures onto the Web, where they can be blown up, touched up and blasted out to one's MySpace or Facebook pages, Flickr accounts or to anyone with an e-mail address.The operative word here is "seamlessly." For years, cellphone users could get pictures from their phones to the Web, but for most people, learning how to use those services is the digital equivalent of a trip to the D.M.V.

Carriers and device manufacturers have only lately figured out that users need a single button that says, "Send my new photo now."

Verizon Wireless in the coming weeks will introduce just such a service. Verizon was not ready to release details about its plan, but Alltel, which Verizon plans to purchase, recently started its Pic Transfer service. For $3 a month, each time a user snaps a photo, a box appears on the cellphone screen asking the shooter if he wants to send the photo to Photobucket, Flickr or whatever online service the user prefers.

How would the phone know which Web site to suggest? The company has eliminated even that small measure of guesswork. Subscribers can bring their phones to an Alltel store where a representative asks the questions and does all the work. Customers who are not near a store can set it up on Alltel's Web site.

No major carrier has quite such an easy service, although some can argue they're close. T-Mobile, for instance, lets users text their photos to "222," and photos will sit on a personal Web page. But those who are not yet on the text-messaging bandwagon will most likely shrink from such a feature. (And yes, Mom, I mean you.)

While we wait for networks to line up one-click photo sharing services, handset makers are jumping in. Nokia, for example, this week announced its newest camera phone marvel, the N96, which will be available in the final three months of the year.

Photography snobs who sniff at camera phones need to look at this thing. The five-megapixel camera features a Carl Zeiss lens with autofocus capabilities — a huge departure from typical camera phones, which have static focal points and therefore render subjects in adequate, but rarely stellar, focus.

What this means, for those who can afford the roughly $900 price tag, is that N96 users will very much want to get their photos to the PC and the Web. For them and other users of newer N-series phones, Nokia has its own method for easy photo sharing.Take a picture with the N96, and the camera's screen offers four icons — one for trash, one for saving the shot to the camera's internal gallery, one for e-mailing the photo and one for sending it to "Share on Ovi," Nokia's free online media sharing service at share.ovi.com. The phone photographer can edit the photo at that site, download it to her PC or send it to another online service.

The phone also "geo-tags" the photo, so others in your area can compare local snapshots online, assuming you have made your pictures public. Some newer phones from Motorola, like the Z8 and Z10, and handsets from Samsung, like the SGH F330 and the SGH i550, come with similar one-click upload software from ShoZu. ShoZu says millions of handsets will be distributed this year in the United States with its software preinstalled.

If you don't happen to have one of those phones, you can get the software on the phone yourself. An undisclosed number of people — probably in the millions — have downloaded ShoZu's software, either from their mobile Web browser (at m.shozu.com) or from ShoZu.com.

Of course, you can also send the photo to a dedicated e-mail address and have it appear on free online photo sharing services like Flickr, or a mobile social networking service like Radar.net. For those new to texting, this requires learning to make the "@" sign appear on the screen.

It also means you will want to consider an unlimited data plan, unless you are especially stingy about the photos you want to keep. But with carriers conveniently introducing ever-better cameras and ever-easier methods to put those photos in circulation, they'll get you upgrading your plan yet.

Quick Calls

¶The cellphone has become many things to many people. Now it's a financial adviser. Intuit, perhaps best known for TurboTax and QuickBooks software, last week introduced Quicken Beam, a service that lets cellphone users check the balances of all their financial accounts or receive alerts whenever balances reach a certain level. Such services have been available from certain financial institutions for a while, but the company says it is the first to check accounts with a variety of financial institutions. Beam is free and works on any cellphone. It is available at intuitlabs.com.¶Tired of being the last person you know without G.P.S. on your phone? You can still get turn-by-turn directions on your cellphone. MapQuest and 1-800-FREE411 last week announced a free service where users speak their current location and their destination, and receive a text message with directions.

¶Handset makers are getting the message: teenagers must text. Just in time for school, Verizon this week released the Blitz, a texting workhorse that features a slide-out keyboard and a dedicated messaging key front and center. The device costs $70, after a $50 mail-in rebate.

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YALE SCHOOL OF ART AND ARCHITECTURE

Yale Revelation: Renewal for a Building and Its Original Designer

By NICOLAI OUROUSSOFF

NEW HAVEN — It's hard to think of a building that has suffered through more indignities than the Yale School of Art and Architecture. On the day of its dedication in 1963, the architectural historian Nikolaus Pevsner condemned the oppressive monumentality of its concrete forms. Two years later the school's dean brutally cut up many of the interiors, which he claimed were dysfunctional. A few years after that a fire gutted what was left. By then the reputation of the building's architect, Paul Rudolph, was in ruins.

Under the circumstances it's a miracle that Yale didn't tear the building down. But several years ago the university started down the road to atonement, investing $126 million in a major restoration and addition designed by the New York firm Gwathmey Siegel & Associates.

The result should stun those who have continued to deny Rudolph's talent. Now seen in its full glory, his building turns out to be a masterpiece of late Modernism, one that will force many to reappraise an entire period of Modernist history and put Rudolph back on the pedestal where he belongs.

Only Gwathmey Siegel's addition prevents this from being a total triumph. The firm's principal designer, Charles Gwathmey, went to great pains to ensure that the addition didn't disturb Rudolph's masterwork. Yet the challenge Mr. Gwathmey faced was not only to be a good neighbor, it was also to rise to the high standards set by his predecessor. By that measure his design is a major letdown.

Rudolph had his own generational battles to fight. His building, which will be renamed Paul Rudolph Hall at a dedication ceremony in November, stands directly across the street from Louis Kahn's 1953 Yale Art Gallery, one of the most brilliant and revered structures of the postwar Modernist period. But many of the attacks against the Rudolph building had more to do with polemics than architecture. To

classical Modernists the art and architecture school's Brutalist aesthetic betrayed the taut glass-enclosed structures of Kahn's museum. To postmodernists it represented the indifference to history and context that they saw as the Modernist movement's greatest sin.

These arguments were reinforced by the heartless renovations after the fire. Windows and skylights were boarded over; additional levels were stuffed between existing floors; large open studios were cut up into a warren of cramped, airless work spaces. The effect was suffocating, and it reflected an attitude of disrespect toward Rudolph that persisted until his death in 1997.

In reopening these spaces Mr. Gwathmey shows us that the building was more sympathetic to its surroundings than once thought. The recessed windows of the front facade are an obvious echo of Kahn's sunken courtyard across the street; so is the masterly play of opaque and transparent surfaces.

Just as important, the subtlety of the design can now be seen. The rough corduroy surfaces of the concrete towers that anchor the structure's corners are now offset by the smooth finish of the horizontal concrete beams, softening the overall appearance. A long narrow planter that runs along the building's front just above street level is used to break down its scale.

But the great revelation is the way the muscularity of the exterior is used to disguise the lightness of the interiors. Like Frank Lloyd Wright in his 1904 Larkin Building, Rudolph sets his entry staircase off center, near a corner marked by a soaring concrete tower. A slender pillar rises out of the staircase's edge. The pillar forces you to enter the space at a slight angle, and then slip between two towering concrete forms before climbing up to the lobby, as if you were passing through a prehistoric gorge.

The sense of spatial compression contributes to the shock you feel once you step inside. Light spills down through skylights. As you step deeper into the space, exterior views open up, including a loving view of Kahn's glass facade. The effect is breathtaking, and it only intensifies as you reach the upper floors.

From the third-floor administrative offices you can gaze down into the main exhibition hall, and farther below, into a periodical reading room. On each floor shallow steps are used to fine-tune the shift in levels and create intimate corners without interfering with the spirit of openness. All of this is reinforced by the dramatic play of light washing down the concrete surfaces.

It is a dazzling display of how to create intricate multidimensional space. But the complexity of the architecture is also driven by a powerful social vision. The relationship between the various floors is meant to foster a sense of solidarity among the students, to engender a big, embracing community of vibrant souls.

Mr. Gwathmey, a student of Rudolph's at Yale in the 1960s, is one of the few to have experienced that vision in its original incarnation. And he is as reverential of the old master in his addition as he was in the restoration work. The new structure, which will house the school's art history department, required a separate entry, but it has a straightforward informality in order not to compete with Rudolph's design. Inside, windows on several floors allow you to catch glimpses of the older building, so that you are always aware of its presence — an apparition hovering in the background.

Not surprisingly, the addition's most powerful innovation is the way in which the two buildings interlock. A staircase leads down into the library. The room, once an outdoor courtyard, is enclosed under a grid of domed skylights. The back of the old art and architecture building is now an interior wall, further blurring the distinction between inside and out. A single skylight extends into Rudolph's second-floor lobby, gracefully tying the two together.

Yet the project demanded more than a competent design. The Rudolph and Kahn buildings are not only masterpieces, they are also powerful statements about the values that shaped American architecture at a

critical moment. Together they represent an enthralling conversation between two great minds across time.

The addition was a rare opportunity to broaden that conversation by extending it into the present. It should have answered the questions: "Who should speak for our era? Where are the great voices of today?"

Mr. Gwathmey doesn't make a strong case for himself. His addition, a series of stacked slabs, lacks the intriguing complexity of Rudolph's vision. He offers an abundance of light-filled spaces, but they lack the precisely framed views and the careful manipulation of light and shadow that are some of an architect's most valuable devices. Nor does he demonstrate the level of artistry that not only reinforces a building's central ideas but also gives you a feel for the architect's hand — the love of craft and obsessive attention to detail that can elevate a structure to greatness.

Everything here, in short, feels sadly conventional. And unlike Rudolph's masterpiece this is something that no amount of restoration work can repair.

http://www.nytimes.com/2008/08/28/arts/design/28yale.html?th&emc=th

Collision Course' for Graduate Education

What's wrong with graduate education these days? Is it what Ph.D. students are missing — teaching skills perhaps, or the ability to branch out beyond their area of specialization? Or is that too many students take too long to finish?

At a discussion Wednesday as the annual meeting of the American Political Science Association kicked off in Boston, panelists agreed that the answer is "all of the above." And they also agreed that there may be a contradiction — a "collision course," in the words of one expert — between the desire to add more elements to graduate education and the increasingly shared view that universities need to cut "time to degree." While the discussion focused on political science, those on the panel have also been involved in graduate education generally, and said many of the issues apply elsewhere in the social sciences.

So what's missing in the training of new Ph.D.'s?

"Today's graduate students have a degree of training and proficiency far in excess of those I had when I started out," said Graham Wilson, a professor of political science at Boston University who earned his Ph.D. in 1975. "But what is happening to wider knowledge? We want to hire [new Ph.D.'s] to teach a number of different courses across the program or to be part of liberal arts programs or to be in interdisciplinary program," he said.

Wilson, who was a graduate director at the University of Wisconsin at Madison earlier in his career and is about to take up that job in his department at BU, said that "we've seen over the decades a progressive narrowing" of the number of fields in political science that graduate students are expected to study in depth. However "admirable" much of the work being produced by new Ph.D.'s may be, he said, "we are producing a narrower product" that doesn't fit with what hiring departments want. And while professors like to talk about grand philosophical issues when considering what a new Ph.D. should learn, he said, it's important to remember that graduate education "is very much about getting jobs."

Theda Skocpol, a professor of government and sociology at Harvard University, said that these issues aren't new. More than five years ago, a panel appointed by Skocpol when she was president-elect of the political science association issued a report calling for more breadth in graduate training. The problem, she said, is that departments haven't fully embraced the ideas — and the field has continued to grow.

"We do risk overspecializing and it's a conundrum. There is more to learn in every subfield," she said. "But I think it behooves us to recognize that on the job market, whether it is going off to work in a college where they are going to want the student to teach multiple courses, or having to develop research ideas that will engage the public over the course of a career, students have to have the ability to combine approaches and address real world questions." With so much specialized knowledge, she said, "it's too easy for us to wander off into very specialized communities and I don't think that will be in our interest."

Political science is also a field in which there has long been tension between subject matter and methods — and some said that may contribute to the problem. Skocpol said it was important that new Ph.D.'s be well versed in more than one methodology.

"There's the constant struggles of substance vs. methods," said Elliot E. Slotnick, associate dean of the Graduate School at Ohio State University. He said he believes that many departments have "gone too far" in favor of methodology and formal theory, and that he worried about "how easy it can be to have someone teach a course on legislatures without really knowing anything about Congress."

Teaching generally is another area where the panel said graduate programs need to do much more. Given that most students will end up at institutions more oriented toward teaching than their Ph.D.-granting universities, graduate education has been remiss in its emphasis on research, the panel said.

So if graduate programs should offer broader training, and also teach their Ph.D. students how to teach, should they stop worrying about "time to degree"? Absolutely not, said the panelists.

Skocpol, who recently completed a term as dean of Harvard's graduate school, is a "time to degree" hawk who aims her firepower not at graduate students but their departments. At Harvard, she instituted an unusually successful reform in which for every five graduate students in years eight or higher of a department's Ph.D. program, the department loses one admissions slot for a new doctoral student. The program has had an immediate impact, with many departments that would have lost admissions slots moving quickly to get their long-time grad students through. If departments aren't pressured to work with grad students, she said, they will tolerate students lingering in programs.

"It's a terrible waste of institutional money and of people's commitments in life" for people to be Ph.D. students 10 years and more, she said.

In fact, while Skocpol pushed for better stipends for graduate students, she said that too much money can discourage grad students from finishing up. She advocates linking funds to timetables.

At Ohio State, which as a large public university operates in a very different financial reality than that of Harvard, Slotnick said that speeding up completion has also been a top priority. The university, for example, links some fellowship support for dissertation writing to the time that a person has taken to get there — so there is an incentive to reach the dissertation-writing stage at a good pace.

Further, he said, the university is starting a "continuous registration" requirement under which anyone wanting to remain a graduate student must pay a modest fee (a few hundred dollars). This should help departments identify who is out there, theoretically finishing a program — and may prod some grad students to take their completion plans off the back burner.

Part of the problem at a place like Ohio State, he said, is that departments don't even know the status of all of their graduate students.

So how could departments and grad schools shift their programs while not extending their duration? The panel offered several ideas.

Redefine time to degree. Skocpol said she is dubious of many of the statistics because they are inconsistent in how they count and they play down the costs of students who drop out. She devised a different standard — counting every graduate student who entered a program and tracking the student for the next 10 years. Those still enrolled at the end of 10 years get a 10, those who have earned their Ph.D.'s earlier get a number representing the years it took them, and those who dropped out get a number reflecting how many years they were enrolled. Then Skocpol divides the total by the number of doctorates awarded.

The result, she said, is the "human years invested per Ph.D." When she did it at Harvard's graduate school, she found departments ranged from 4 to 16 years — with the higher figures representing not only more years of work on a doctorate, but more work prior to dropping out. These figures, she said, "are embarrassing" to departments — and can be used to promote discussion and reforms.

Make better use of summers — including the pre-enrollment summer. Many graduate students need extra math assistance or (for those from some parts of the world) English assistance, and this should be taking place the summer prior to grad school, not during the program itself. This allows more students to move at a good pace from day one. Further, they said that summers are ideal time for interdisciplinary programs involving graduate students from multiple departments or from different parts of a discipline. While noting that summer programs require funding for grad students, the general sense was that summers are not sufficiently utilized, especially early in a Ph.D.

Build ties to teaching institutions. Slotnick said that Ohio State has used the Preparing Future Faculty program — an initiative of the Council of Graduate Schools — to offer a range of programs for graduate students about what their future jobs are likely to be. A key lesson, he said, was the need to get graduate students on teaching-oriented campuses so they could see what such careers look like. Ohio State works with faculty members at Kenyon College and other liberal arts colleges in the state — with programs at Columbus and the various college campuses. Some graduate students have mentors at the colleges and

get to spend time there and teach — while they are still shaping their graduate program. In this way, an awareness of what potential employers would want is clear much earlier than a job talk.

Discourage early publishing and presenting. Slotnick said that in terms of grad students having more time for breadth, they can cut back on the trend of trying to publish articles and make presentations early in their graduate student careers. He said that many of these papers just aren't that good — and hurt the reputations of the students and their programs.

Create "research workshops." Skocpol said that the social sciences need to embrace the positive role of laboratories in the physical and biological sciences by encouraging more team work and sharing of work. In the workshops, graduate students present papers for critique by colleagues — and get into the regular pattern of presenting work, responding to critiques, and sharing ideas. Even if participants are from the same discipline, they will not be as close to a project as the student him or herself and the dissertation committee. As a result, the grad students learn to respond to people without as much knowledge as they have. This not only encourages a broader perspective, but prepares student for the job hunt. "When you go on the job market, it's not the talk that gets you the job, but how you answer the questions," Skocpol said.

Teach time management. Skocpol said that faculty mentors should actively teach time management, especially with regard to teaching undergraduates. "Teaching them how to be good teachers and how not to let it eat up all of your time" is key, she said. Graduate students need to be told that they can be responsive to undergraduates without "being available 24 hours a day," and the need to learn that if a teaching assistant position is supposed to represent one fifth of their workload "how to do it in one fifth of their time."

— Scott Jaschik

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/08/28/grad.

Sharing Information About 'Struggling' Med Students

As colleges have begun paying increasing attention to retaining their current students, they have embraced a range of strategies for identifying and helping those who struggle. Virtually all of those strategies — such as "early warning" systems and "intrusive advising" — depend on a "it takes a village" approach, in which the more people working together to help the student, the better.

Those and other tactics, though, more or less depend on widespread sharing of information about how students are faring — particularly if they are struggling. But a series of articles released Wednesday — while relegated to the sphere of medical education, which has some unusual characteristics — suggests significant reluctance on the part of some educators to share information about at-risk students with some colleagues who might be in a position to help the students later.

The articles, published in the September issue of *Academic Medicine*, the journal of the Association of American Medical Colleges, include a report on a survey and three editorials about medical schools' policies regarding the sharing of information about students who struggle during required "clerkships" in internal medicine in their third and fourth years of medical school.

The study, which was conducted by researchers at Rush Medical College in Chicago, Cleveland's Case Western Reserve University, and the Uniformed Services University of the Health Sciences, in Maryland, first asked the directors of internal medicine clerkship programs how many of the students were identified as "struggling" through performance on written exams, evaluations of their clinical performance, peer assessments, and other measures, including formal evaluations of "professionalism." Individual respondents identified between 0 and 15 percent of students in their programs as struggling. This figure includes only those students who were deemed to be struggling at the end of their clerkships, excluding those who had struggled during the clerkship but improved their performance (through remediation or otherwise) by the time it ended.

To the surprise of the researchers, more than two-thirds of the students the directors identified as "struggling" received non-failing grades, and significant numbers received grades high enough that they probably would not have shown up on the radar screens of the "promotions committees" or other officials at their medical schools who are charged with assessing the academic status of students. While those higher-than-expected grades may reflect "individual students' unique circumstances," the authors write, "the high percentage of satisfactory or above-average grades does raise concern regarding grade inflation.... Giving struggling students satisfactory grades may lessen the chances of those students being identified as struggling, thus reducing the potential for remediation."

Students who did receive failing or otherwise unsatisfactory grades were commonly referred to a "promotions" committee at their institution. But while nearly two-thirds of the clerkship directors said they believed that they should share information about struggling students with other clerkship directors at the institution, and nearly half thought they should share such information with students' medical school instructors, far fewer actually did so (51 percent shared this information with other clerkship directors; 36 percent shared it with medical school instructors).

Those who favored sharing information with instructors and others who might work with the students down the road said they did so because they wanted to provide a supportive educational environment and to identify students' problems early, and because they "viewed medical education as a continuum," the report says. (Two commentaries in the same issue of *Academic Medicine* — by academics at the State University of New York's Upstate Medical University and the Uniformed Services University — endorsed the idea of such information sharing for those and other reasons.)

Those who opposed sharing information about students' failings cited a "fear of creating bias or prejudice against students, and lack of trust that clerkship directors will use such information appropriately." Some also said they feared litigation from students. (One commentary in the issue of Academic Medicine — by a dean at the University of Texas Southwestern Medical Center at Dallas — discouraged the sharing of such information, expressing concerns about stigmatization of struggling students.)

Only 14 percent of institutions had formal policies on sharing information, and most of them "were specifically prohibited from discussing students with academic difficulty with current teachers or other clerkship directors," the report says.

Sandra L. Frellsen, assistant professor of medicine and co-clerkship director at Rush Medical College and the study's lead author, said the degree of grade inflation created numerous potential problems. First, "if students are never given a grade that identifies them as struggling, then they're missing out on an opportunity to get remediation," she said. Perhaps more seriously, given that these are students nearing the end of their medical school careers, there's a possibility that significant flaws might not get corrected until the soon-to-be doctors are treating patients, if ever. "We do have an obligation to say, when we graduate students, that they're ready and that they're not going to be a danger," she said.

Frellsen said she and her colleagues endorse the sharing of "limited information" about struggling students to help ensure that they get the help they needed from their instructors. "If a student had a difficult time representing a patient's medical history in an organized, succinct way in the clerkship, that would be useful information for the director of the next rotation to know, so attention can be paid to that," she said. Frellsen and her fellow authors call for a national standard that at least permits, if not openly encourages, the sharing of such information. "It would be easier if this were dealt with at the national level," she said.

Although the study in *Academic Medicine* focuses on medical education, its findings resonate with issues in undergraduate education, too, said George D. Kuh, Chancellor's Professor of Higher Education and director of the Center for Postsecondary Research at Indiana University at Bloomington. Kuh noted that there is great variation among colleges in how they approach student performance, with certain institutions — he singled out many historically black colleges — adopting a "talent development" orientation in which all hands work together to help students improve the most.

The competitiveness of medical schools, which are typically "creaming the cream off the top" of undergraduate student bodies, may lead faculty members and officials there to see information about students' academic troubles leading to "bias" against them. But it's hard to see, Kuh said, how such a view results in helping institutions help their students. Kuh said he was troubled by the suggestion of some medical school officials that "we don't trust others in our setting to have this information.... We have to be confident that others having this information will somehow make a positive difference in the students' performance."

— Doug Lederman

The original story and user comments can be viewed online at

http://insidehighered.com/news/2008/08/28/med.

Model targets foot-and-mouth risk

By Elizabeth Mitchell
Science Reporter, BBC News

UK scientists have found a way to quickly identify livestock at risk from infection through airborne transmission of the foot-and-mouth virus.

The control of foot-and-mouth outbreaks is of global socio-economic importance.

Researchers have created a simple risk model by combining weather and livestock information collected during the 1967 UK foot-and-mouth outbreak.

It may be possible to automate the system, the scientists suggest in the Journal of the Royal Society.

Outbreaks of foot-and-mouth - a highly contagious disease of cloven-hoofed animals - cause severe disruption to the farming sector and economy.

Dr Schley from the Pirbright Laboratory at the Institute for Animal Health in Surrey explained that transmission of the virus between different premises can mostly be controlled by implementing stringent control measures:

"You can stop animal movements, try to enforce bio-security on farms and try and make sure people disinfect themselves," he told BBC News.

However, airborne transmissions are particularly difficult to control: "All we can do is try to detect and contain such transmissions afterwards," explained Dr Schley.

Airborne transmission of virus particles is influenced by the wind and atmospheric turbulence.

Dr David Schley and colleagues used NAME in their study - a system that has been developed by the UK Meteorological Office to predict the weather.

They also incorporated details about the source of the virus - including the number of animals infected.

The model was tested by applying it to the recent 2007 UK outbreak in Surrey.

Data deficient

The scientists recognise that successful implementation of these predictions requires accurate information regarding the location of animals before any outbreak occurs.

The independent review of the 2007 UK foot-and-mouth outbreak by Dr Iain Anderson included recommendations for improved "data and information management systems".

"(Currently), we know where the owner of the animals lives, but that is slightly different from knowing where the animal is. If that information was available you could make some useful and powerful predictions in terms of risk," said Dr Schley.

He added: "The level of information that I would like the UK to aspire to has already been achieved by other countries - including New Zealand."

A well-coordinated and reliable data system could be automated: "The next day (we) would be able to say, these are the farms that we feel are the priority for inspection."

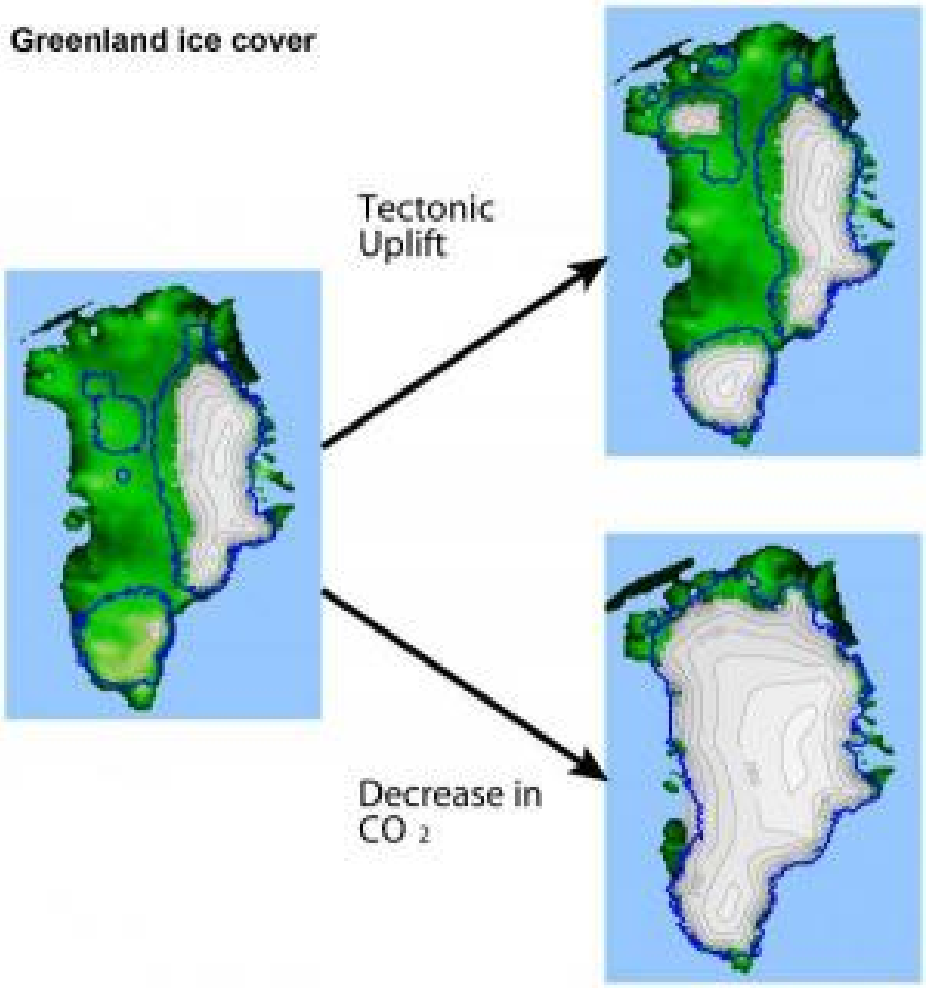
Scientists at the Institute for Animal Health have developed other models for predicting the transmission of other viral diseases that affect livestock:

"(Bluetongue) is spread by midges - but they can be affected by which way the wind blows because they are so tiny and light," commented Dr Schley.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7582760.stm

Published: 2008/08/27 12:46:22 GMT

Why Is Greenland Covered In Ice? Changes In Carbon Dioxide Levels Explain Transition



Computer models show that while (tectonic) uplift of the Rocky Mountains may have contributed to increased ice cover on Greenland, this change was small in comparison with the ice sheet caused by a decrease in carbon dioxide. (Credit: Dan Lunt, University of Bristol)

ScienceDaily (Aug. 28, 2008) — There have been many reports in the media about the effects of global warming on the Greenland ice-sheet, but there is still great uncertainty as to why there is an ice-sheet there at all.

Reporting today (28 August) in the journal Nature, scientists at the University of Bristol and the University of Leeds show that only changes in atmospheric carbon dioxide are able to explain the transition from the mostly ice-free Greenland of three million years ago, to the ice-covered Greenland of today.

Understanding why the ice formed on Greenland three million years ago will help understand the possible response of the ice sheet to future climate change.

Dr Dan Lunt from the University of Bristol and funded by the British Antarctic Survey, explained: "Evidence shows that around three million years ago there was an increase in the amount of rock and debris deposited on the ocean floor around Greenland. These rocks could not have got there until icebergs

started to form and could transport them, indicating that large amounts of ice on Greenland only began to form about three million years ago.

"Prior to that, Greenland was largely ice-free and probably covered in grass and forest. Furthermore, atmospheric carbon dioxide levels were relatively high. So the question we wanted to answer was why did Greenland become covered in an ice-sheet?"

There are several competing theories, ranging from changes in ocean circulation, the increasing height of the Rocky Mountains, changes in the Earth's orbit, and natural changes in atmospheric greenhouse gas concentrations. Using state-of-the-art computer climate and ice-sheet models, Lunt and colleagues decided to test which, if any, of these theories was the most credible.

While the results suggest that climatic shifts associated with changes in ocean circulation and tectonic uplift did affect the amount of ice cover, and that the ice waxed and waned with changes in the Earth's orbit, none of these changes were large enough to contribute significantly to the long-term growth of the Greenland ice sheet.

Instead, the new research suggests that the dominant cause of the Greenland glaciation was the fall from high atmospheric carbon dioxide levels to levels closer to that of pre-industrial times. Today concentrations are approaching the levels that existed while Greenland was mostly ice-free.

Dr Alan Haywood from the University of Leeds added: "So why did elevated atmospheric carbon dioxide concentrations fall to levels similar to the pre-industrial era? That is the million dollar question which researchers will no doubt be trying to answer during the next few years."

This work was carried out in the framework of the British Antarctic Survey Greenhouse to ice-house: Evolution of the Antarctic Cryosphere and Palaeoenvironment programme. Dan J.Lunt is funded by British Antarctic Survey and Research Councils UK fellowships. Gavin L. Foster is funded by a NERC research fellowship. Emma J Stone is funded by a NERC studentship.

Journal reference:

1. Daniel J. Lunt, Gavin L. Foster, Alan M. Haywood, and Emma J. Stone. **Late Pliocene Greenland glaciation controlled by a decline in atmospheric CO2 levels**. *Nature*, 2008; 454 (7208): 1102 DOI: 10.1038/nature07223

Adapted from materials provided by University of Bristol.

http://www.sciencedaily.com:80/releases/2008/08/080827163818.htm

Heart Attack Patients Who Stop Statin Risk Death, Say Researchers

ScienceDaily (Aug. 28, 2008) — Patients discontinuing statin medication following an acute myocardial infarction (AMI) increase their risk of dying over the next year, say researchers at McGill University and the McGill University Health Centre (MUHC). Their study was published in a recent issue of the European Heart Journal.

Using data on British patients who survived an AMI and were still alive three months later, Dr. Stella Daskalopoulou and colleagues found that those who discontinued their statin medication were 88% more likely to die during the following year compared to those who had never been on the medication.

"Statins were found to be beneficial drugs," said Dr. Daskalopoulou, of McGill's Faculty of Medicine and the Department of Medicine and the Division of Clinical Epidemiology at the MUHC. "Patients who used statins before an AMI and continued to take them after were 16% less likely to die over the next year than those who never used them. So even if it appears that the statins failed to prevent your AMI, it is beneficial to continue taking them and potentially quite harmful to stop."

The large, population-based cohort study was conducted using UK data to take advantage of the medical records kept in the General Practice Research Database (GPRD), which collects information on the health of more than three million patients across the UK.

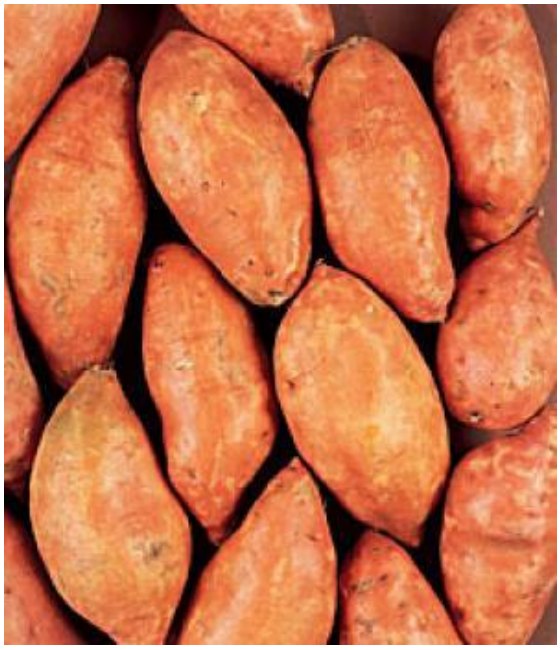
"In the general population the statin discontinuation rate within the first year of prescription is 30 percent. That's very high," Dr. Daskalopoulou continued. "Because statins are preventative drugs, patients may not feel the immediate benefit of taking them and sometimes stop. However, it looks like this might be quite a dangerous practice after an AMI."

The harmful effects of statin discontinuation may be the result of many different mechanisms, including individual patient characteristics, the researchers explained. "Regardless of the mechanism or explanation, physicians should be careful when assessing each patient's medication needs," Dr. Daskalopoulou said. "Patients also need to take their medications exactly as prescribed after an AMI. Statins in particular should only be withdrawn after an AMI under close clinical supervision."

Adapted from materials provided by McGill University.

http://www.sciencedaily.com/releases/2008/08/080827164033.htm

Sweet Potato Out-Yields Corn In Ethanol Production Study



Sweet potatoes can yield two to three times as much fuel ethanol as field corn, approaching the amount that sugarcane can produce. (Credit: Photo courtesy of the Louisiana Sweet Potato Commission)

ScienceDaily (Aug. 28, 2008) — In experiments, sweet potatoes grown in Maryland and Alabama yielded two to three times as much carbohydrate for fuel ethanol production as field corn grown in those states, Agricultural Research Service (ARS) scientists report. The same was true of tropical cassava in Alabama.

The sweet potato carbohydrate yields approached the lower limits of those produced by sugarcane, the highest-yielding ethanol crop. Another advantage for sweet potatoes and cassava is that they require much less fertilizer and pesticide than corn.Lew Ziska, a plant physiologist at the ARS Crop Systems and Global Change Laboratory in Beltsville, Md., and colleagues at Beltsville and at the ARS National Soil Dynamics Laboratory in Auburn, Ala., performed the study. The research is unique in comparing the root crops to corn, and in growing all three crops simultaneously in two different regions of the country.

The tests of corn, cassava and sweet potato were in the field at Beltsville, and in large soil bins at Auburn.

For the sweet potatoes, carbohydrate production was 4.2 tons an acre in Alabama and 5.7 tons an acre in Maryland. Carbohydrate production for cassava in Alabama was 4.4 tons an acre, compared to 1.2 tons an acre in Maryland. For corn, carbohydrate production was 1.5 tons an acre in Alabama and 2.5 tons an acre in Maryland.The disadvantages to cassava and sweet potato are higher start-up costs, particularly because of increased labor at planting and harvesting times. If economical harvesting and processing techniques could be developed, the data suggests that sweet potato in Maryland and sweet potato and cassava in Alabama have greater potential than corn as ethanol sources.

Further studies are needed to get data on inputs of fertilizer, water, pesticides and estimates of energy efficiency. Overall, the data indicate it would be worthwhile to start pilot programs to study growing cassava and sweet potato for ethanol, especially on marginal lands.

The additional research could help develop new biofuel sources without diverting field corn supplies from food and feed use to fuel.

Adapted from materials provided by USDA/Agricultural Research Service. Original article written by Don Comis.

http://www.sciencedaily.com/releases/2008/08/080825200752.htm

Yellowstone's Ancient Supervolcano: Molten Plume Of Material Cooler Than Expected

Yellowstone National Park and its famous geysers are the remnants of an ancient supervolcano. (Credit: U.S. Geological Survey)

ScienceDaily (Aug. 28, 2008) — The geysers of Yellowstone National Park owe their existence to the "Yellowstone hotspot"--a region of molten rock buried deep beneath Yellowstone, geologists have found.

But how hot is this "hotspot," and what's causing it?

In an effort to find out, Derek Schutt of Colorado State University and Ken Dueker of the University of Wyoming took the hotspot's temperature.

The scientists published results of their research, funded by the National Science Foundation (NSF)'s division of earth sciences, in the August, 2008, issue of the journal Geology.

"Yellowstone is located atop of one of the few large volcanic hotspots on Earth," said Schutt. "But though the hot material is a volcanic plume, it's cooler than others of its kind, such as one in Hawaii."

When a supervolcano last erupted at this spot more than 600,000 years ago, its plume covered half of today's United States with volcanic ash. Details of the cause of the Yellowstone supervolcano's periodic eruptions through history are still unknown.

Thanks to new seismometers in the Yellowstone area, however, scientists are obtaining new data on the hotspot.

Past research found that in rocks far beneath southern Idaho and northwestern Wyoming, seismic energy from distant earthquakes slows down considerably.

Using the recently deployed seismometers, Schutt and Dueker modeled the effects of temperature and other processes that affect the speed at which seismic energy travels. They then used these models to make an estimate of the Yellowstone hotspot's temperature.

They found that the hotspot is "only" 50 to 200 degrees Celsius hotter than its surroundings.

"Although Yellowstone sits above a plume of hot material coming up from deep with the Earth, it's a remarkably 'lukewarm' plume," said Schutt, comparing Yellowstone to other plumes.

Although the Yellowstone volcano's continued existence is likely due to the upwelling of this hot plume, the plume may have become disconnected from its heat source in Earth's core.

"Disconnected, however, does not mean extinct," said Schutt. "It would be a mistake to write off Yellowstone as a 'dead' volcano. A hot plume, even a slightly cooler one, is still hot."

Adapted from materials provided by National Science Foundation.

http://www.sciencedaily.com/releases/2008/08/080827164142.htm

Nonviable Seeds May Contain Research-Quality DNA

Seeds can still reveal genetic information even after they will no longer germinate, offering the hope of obtaining usable DNA even from 100-year-old seeds. (Credit: Photo by Stephen Ausmus)

ScienceDaily (Aug. 28, 2008) — Agricultural Research Service (ARS) scientists in Fort Collins, Colo., have ways of making seeds talk. They have demonstrated that seeds can reveal genetic information even after they've lost viability, which is the ability to germinate. The research has significant implications for seed bank management.

The research was conducted by plant physiologist Christina Walters, plant physiologist Gayle M. Volk and plant geneticist Christopher M. Richards at the ARS National Center for Genetic Resources Preservation (NCGRP) in Fort Collins, Colo.

Like all genebanks, the NCGRP stores genetic materials that researchers can use to study the nature, function and evolution of genes. All seeds lose viability in storage, however, and samples that can no longer germinate are often discarded. But new research shows that even low-viability seeds can contain research-quality DNA.

The ARS scientists examined three sets of seeds, ranging in age from one year to 135 years. They were able to extract usable DNA from all of the seeds—even the oldest set, which had been stored in a Georgia attic since the Civil War.

This is significant because donated collections, such as the Civil War seeds used in this study, are sometimes infested with microbes that contain enzymes capable of degrading the seeds' DNA. Fortunately, genetic materials at the NCGRP are stored under optimal conditions, and are at lower risk for degradation.

Because the oldest seeds in this study are no longer capable of germinating, the scientists have no means of measuring their phenotypes, or observable genetic traits. However, stable DNA enables researchers to study the parent plants' genetic material and uncover information about their genetic diversity.

Adapted from materials provided by USDA/Agricultural Research Service. Original article written by Laura McGinnis.

http://www.sciencedaily.com/releases/2008/08/080825201928.htm

Cocaine-induced Brain Plasticity May Protect The Addicted Brain: Findings May Lead To New Drug-abuse Treatments

Dr. Christopher Cowan (right), assistant professor of psychiatry, found that increased brain connections during chronic drug use may actually limit behavioral changes associated with addiction, rather than support them. The team, including lead authors Dr. Suprabha Pulipparacharuvil and William Renthal, hopes this finding could lead to a pathway for pharmaceutical treatment of addiction. (Credit: Image courtesy of UT Southwestern Medical Center)

ScienceDaily (Aug. 27, 2008) — Increased connections among brain cells caused by excessive drug use may represent the body's defense mechanism to combat addiction and related behaviors, scientists at UT Southwestern Medical Center have found.

Previous studies have shown that repeated use of drugs such as cocaine, amphetamines and nicotine increase the number of anatomical structures called dendritic spines in brain regions associated with pleasure and reward. These dendritic spines represent sites where brain cells communicate with one another. Many scientists believe that this long-lasting brain rewiring underlies the similarly persistent behaviors of drug-taking and drug-seeking associated with addiction and relapse. The mechanism that controls this brain rewiring, however, and its relationship to addiction-related behaviors were previously unknown.

In a study appearing in the Aug. 28 issue of Neuron, researchers found that cocaine suppresses the activity of the protein MEF2 in mice. Because MEF2 normally reduces the number of brain connections, suppressing MEF2 leads to an increase in dendritic spine density. The researchers also found that when they enhanced MEF2 activity in the brain this blocked the drug-induced increase in dendritic spine density and increased addiction-related behavioral responses to cocaine.

"Our findings suggest that increased brain connections during chronic drug use may actually limit behavioral changes associated with drug addiction, rather than support them," said Dr. Christopher Cowan, assistant professor of psychiatry at UT Southwestern and senior author of the study.

Researchers said they hope this finding could lead to a pharmaceutical treatment for addiction.

"Relapse, or the resumption of active drug-taking and drug-seeking, is very common in drug addicts," Dr. Cowan said. "Addiction-related brain changes and behaviors seem to be hardwired and semipermanent, and there are limited treatment options. Our data suggest that rather than trying to block the process of increasing dendritic spine density, we may actually want to look at treatments that try to enhance this process."

MEF2 is activated in response to brain activity. It provides negative feedback to eliminate the potential growth of too many communication sites between nerve cells. Repeated exposure to cocaine disrupts this function of MEF2, resulting in new brain connections.

To investigate the relationship between MEF2 and spine-density changes, the researchers varied the level of the protein in an area of the brain called the nucleus accumbens. This region is associated with the feelings of reward that drug addicts seek. Brain imaging done after mice were given cocaine showed that cocaine stopped MEF2 from limiting dendritic spine increases.

To test MEF2's relationship to behavior, researchers monitored the movement of mice after repeated daily exposure to the same amount of cocaine. This same dose of cocaine produced a larger behavioral response after repeated days of drug injections, resulting in a "sensitized" response. This sensitized behavioral response to the drug is very stable, lasting for many months after the drug is discontinued.

When the researchers manipulated animals so that their MEF2 levels remained high in the presence of cocaine, the animals were more sensitive to the drug. This suggested that increased communication sites might help combat the addiction process.

"This suggests the exciting possibility that MEF2 proteins may control expression of key genes that modulate drug-related brain changes and behavior," Dr. Cowan said. "If we understand which genes are influenced by MEF2, we can intervene and try to help the system resist or reverse these sensitization processes."

In 2006, 23.6 million people ages 12 and older needed treatment for drug or alcohol abuse, according to a Substance Abuse and Mental Health Services Administration survey. Substance abuse costs the U.S. more than half a trillion dollars annually, according to the National Institute on Drug Abuse.

Future research will focus on determining MEF2 target genes and exploring drug-related density changes in other regions of the brain associated with addiction, Dr. Cowan said.

Other UT Southwestern researchers involved in the study were Dr. Suprabha Pulipparacharuvil, instructor of psychiatry; William Renthal, graduate student in psychiatry and neuroscience; Carly Hale, research technician in psychiatry; Dr. Makoto Taniguchi, postdoctoral researcher in psychiatry; Colleen Dewey, graduate student in neuroscience; Dr. Scott Russo, assistant instructor of psychiatry; Dr. Devanjan Sikder, instructor of internal medicine; and Dr. Guanghua Xiao, assistant professor of clinical sciences. Dr. Eric Nestler, former chairman of psychiatry, and former instructor Dr. Arvind Kumar were also involved. Researchers from Yale and Rockefeller University also participated.

The work was funded by the Whitehall Foundation, the National Institute on Drug Abuse and the National Institute of Mental Health.

Adapted from materials provided by UT Southwestern Medical Center.

http://www.sciencedaily.com/releases/2008/08/080827163820.htm

How The Brain Compensates For Vision Loss Shows Much More Versatility Than Previously Recognized

ScienceDaily (Aug. 27, 2008) — Previous research has found that when vision is lost, a person's senses of touch and hearing become enhanced. But exactly how this happens has been unclear.

Now a long-term study from the Berenson-Allen Center for Noninvasive Brain Stimulation at Beth Israel Deaconess Medical Center (BIDMC) demonstrates that sudden and complete loss of vision leads to profound – but rapidly reversible -- changes in the visual cortex. These findings, reported in the August 27 issue of the journal PLOS One, not only provide new insights into how the brain compensates for the loss of sight, but also suggest that the brain is more adaptable than originally thought.

"The brain's ability to reorganize itself is much greater than previously believed," explains senior author Alvaro Pascual-Leone, MD, PhD, Director of the Berenson-Allen Center and Professor of Neurology at Harvard Medical School (HMS). "In our studies [in which a group of sighted study subjects were blindfolded for five days], we have shown that even in an adult, the normally developed visual system quickly becomes engaged to process touch in response to complete loss of sight. The speed and dynamic nature of the changes we observed suggest that rather than establishing new nerve connections – which would take a long time – the visual cortex is unveiling abilities that are normally concealed when sight is intact."

Or, as first author Lotfi Merabet, OD, PhD, describes, "In a sense, by masking the eyes, we unmask the brain's compensatory potential."

The scientists had previously shown that study subjects with normal vision who are blindfolded for a five-day period performed better than non-blindfolded control subjects on Braille tests. Subsequent brain scans found that blindfolded subjects also experienced dramatic changes in the brain's visual cortex.

In this study, the authors set out to determine the origins of these outcomes: Were they the result of new nerve connections being developed? Or were latent capabilities in the brain's visual cortex being "unmasked" in response to the loss of sight?

"We recruited 47 subjects to participate in the study," explains Merabet, Assistant Professor of Ophthalmology and Neurology at HMS. "Half of the study participants remained completely blindfolded, 24 hours a day, for a total of five days under the careful watch of the staff of BIDMC's General Clinical Research Center. The other half were only blindfolded for testing, but spent the rest of the day seeing normally. During their stays, both sets of study participants underwent intensive Braille instruction for four to six hours a day from a professional instructor from the Carroll Center for the Blind."

The study participants also underwent serial brain scans (known as fMRI or functional magnetic resonance imaging) at both the beginning and end of the five-day study period.

As predicted, the researchers found that the subjects who were blindfolded were superior at learning Braille than their non-blindfolded counterparts. Furthermore, the brain scans of the blindfolded subjects showed that the brain's visual cortex had become extremely active in response to touch (in contrast to the initial scan in which there was little or no activity). Twenty-four hours after the blindfolds were removed, the subjects were re-scanned, whereby it was discovered that their visual cortices were no longer responsive to tactile stimulation – in other words, reading Braille no longer activated "sight" among the study subjects. Finally, using transcranial magnetic stimulation (TMS) to transiently block the function of the visual cortex, the scientists demonstrated that disruption of the visual cortex impaired tactile function and Braille reading after five days of blindfolding – but not a day after the blindfold was removed and never in the control subjects.

"This extremely rapid adaptation indicates that functions that are normally inhibited in the brain's visual cortex will come to the surface when they are needed," adds Merabet. "We believe that over time, if these adaptive functions are sustained and reinforced, they will eventually lead to permanent structural changes."

"Our brain captures different types of information from the world -- sounds, sights, smells or tactile sensations," adds Pascual-Leone. "The impressions we form require us to merge these various different elements, but science's traditional view of brain function is that it is organized in separate and highly specialized systems."

But, he says, as the results of this research demonstrate, that is not the case.

"Our study shows that these views are incorrect and illustrate the potential for the human brain to rapidly and dynamically reorganize itself," notes Pascual-Leone. "We have shown that even in an adult, the normally developed visual system quickly becomes engaged to process touch in response to complete loss of sight. And we believe that these principles may also apply to other sensory loss, such as deafness or loss of function following brain injury."

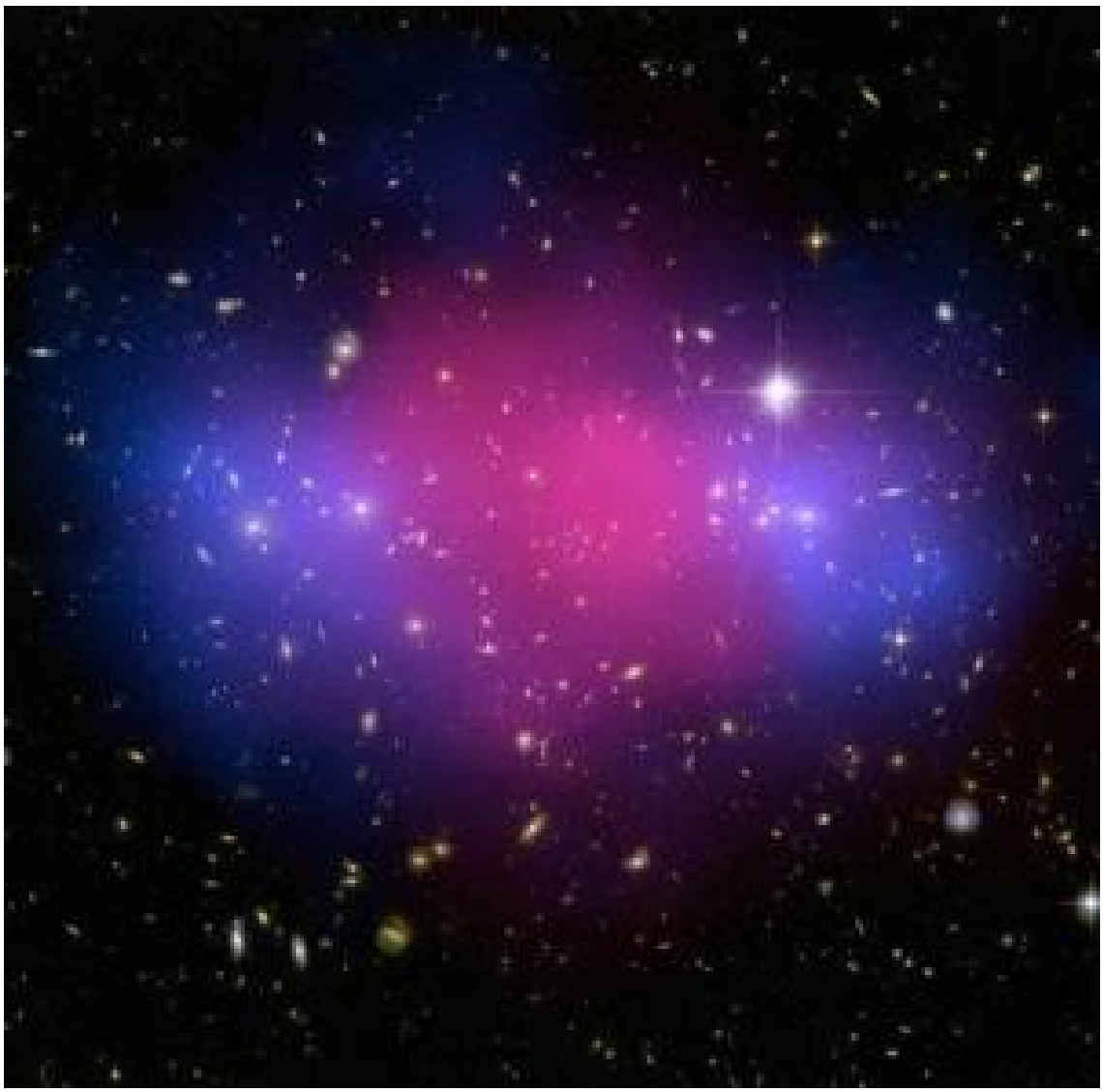
In addition to Pascual-Leone and Merabet, study coauthors include BIDMC investigators Roy Hamilton, Gottfried Schlaug, Jascha Swisher, Elaine Kiriakopoulos, Naomi Pitskel, and Thomas Kauffman.

This study was funded by grants from the National Eye Institute, National Institutes of Health.

Adapted from materials provided by Beth Israel Deaconess Medical Center, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080827002719.htm

Clash Of Clusters Provides New Dark Matter Clue



Hubble and Chandra Composite of the Galaxy Cluster MACS J0025.4-1222. (Credit: NASA, ESA, CXC, M. Bradac (University of California, Santa Barbara), and S. Allen (Stanford University))

ScienceDaily (Aug. 27, 2008) — New Hubble and Chandra observations of the cluster known as MACSJ0025.4-1222 indicate that a titanic collision has separated dark from ordinary matter. This provides independent confirmation of a similar effect detected previously in a target dubbed the Bullet Cluster, showing that the Bullet Cluster is not an anomalous case.

MACSJ0025 formed after an enormously energetic collision between two large clusters. Using visible-light images from Hubble, astronomers were able to infer the total mass distribution — dark and ordinary matter. Hubble was used to map the dark matter (coloured in blue) using a technique known as gravitational lensing.

Chandra data enabled the astronomers to accurately map the ordinary matter, mostly in the form of hot gas, which glows brightly in X-rays (shown in pink).

As the two clusters that formed MACSJ0025 (each almost a whopping quadrillion times the mass of our Sun) merged at speeds of millions of kilometres per hour, hot gas in the two clusters collided and slowed down, but the dark matter passed right through this smash-up. The separation between material shown in pink and blue therefore provides observational evidence for dark matter and supports the view that dark matter particles interact with each other only very weakly or not at all, apart from the pull of gravity.

The international team of astronomers in this study was led by Maruša Bradac of the University of California, Santa Barbara, USA, and Steve Allen of the Kavli Institute for Particle Astrophysics and Cosmology at Stanford University and the Stanford Linear Accelerator Center (SLAC), USA. Their results will appear in an upcoming issue of The Astrophysical Journal.

Adapted from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2008/08/080827104704.htm

Researching Impact Of Global Warming On Corals

Scientists capture coral spawn using a special net. (Credit: Ramon Villaverde, Columbus Zoo)

ScienceDaily (Aug. 27, 2008) — For just one late-summer night each year, the shallow waters off the coast of Puerto Rico fill with the pale-pink spawn of elkhorn corals -- the tiny, round packets of the adult corals' eggs and sperm.

This year, Iliana Baums, assistant professor of biology at Penn State, is there to collect the coral spawn as part of a research and education project to grow the newborn juvenile corals for distribution to aquaria and to the wild. "It looks like it's snowing," she said, "except that the egg and sperm packets rise underwater to the surface rather than fall to the ground."

Baums's reason for collecting the spawn is twofold: she hopes to acquire important information about how corals will respond to global warming, and she also is teaching a group of 28 aquarium professionals, as part of an international workshop, how they can participate in the protection of corals. Baums will hunt for and collect coral spawn on the nights of 21 and 22 August. For seven days thereafter, she will remain at the site, working to grow the newborn juvenile corals for distribution to aquaria and to the wild.

According to Baums, corals are extremely sensitive to changes in water temperature. "An increase in water temperature of just a couple degrees Celsius results in visible damage to adult corals and their offspring," she said. Referring to a paper published in a July 2008 issue of the journal Science in which the authors report that one-third of all reef-building corals face an elevated risk of extinction from climate change and other factors, Baums said it is imperative that scientists and marine-resource managers begin to think about how to rescue these important animals.

That's why Baums is searching for particular populations of coral that produce offspring that are better able to withstand high water temperatures. Because most coral species are triggered by moonlight to release their egg-sperm packets, Baums will begin her experiment with a nighttime trip to a designated reef off the coast of Puerto Rico. There, she will collect spawn from elkhorn corals, which are protected as a threatened species by the United States Endangered Species Act. In small rearing chambers, she will place eggs from certain populations with sperm from certain other populations.

Over the next seven days, she will raise the newly formed juvenile corals in saltwater tanks on land. She then will ship half of them to several aquaria around the world and will return the other half to the reef. "Corals are most vulnerable when they are very small, and our protected nursery will help them to get through the first critical days," said Baums.

Next, the juvenile corals in captivity will be subjected to a variety of higher-than-normal and lower-than-normal water temperatures in order to pinpoint those offspring whose parents can tolerate abnormal water conditions. Once Baums identifies these individuals, she will search their genomes for variants of genes

that are responsible for resistance to abnormal water temperatures. With this knowledge, she then can develop genetic markers that will enable her to identify wild elkhorn-coral populations throughout the Caribbean that contain such gene variants.

Water from the ocean is pumped into tubs where juvenile corals will be raised for a period of seven days after scientists harvest them from the wild.

In collaboration with SECORE (SExual COral REproduction), an international organization of professional aquarists and scientists that is concerned about coral conservation, Baums will hold a workshop during the annual coral-spawning event in Puerto Rico. Through the workshop, she and other researchers will teach a group of 28 aquarium professionals from around the world how to collect coral spawn, do fertilization experiments, raise larvae, and care for larvae once they are shipped back to the participants' home institutions. The workshop, which is now in its third year, already has been given to over 60 aquarium professionals. Baums and other members of SECORE plan to continue to the workshop in future years to reach as many aquarium professionals as possible.

"Poachers often collect wild corals to satisfy the demand for aquariums, but aquarium professionals are looking for alternative, less destructive sources of these animals. SECORE's goal is to develop methods to eventually breed corals in captivity, thereby reducing some of the pressure to collect corals from the wild," she said. "We are starting by raising juveniles from wild-caught eggs and sperm, which enables us to provide aquariums with the corals they desire without damaging wild adult colonies.

In return, the aquarium operators help us to perform the experiments and give us tips on how to raise adult corals in captivity, which is something they are very good at." Baums added that the establishment of good aquarium populations is a safeguard against the extinction of elkhorn corals.

The corals that Baums ships to aquaria will undergo one of two treatments: half of them will be exposed to species of the zooxanthellae -- algae that live inside the cells of corals and provide them with necessary nutrients and energy -- that naturally occur with elkhorn corals, and half of them will be exposed to zooxanthellae from other regions of the world, where elkhorn corals are not present.

In past years, elkhorn corals in captivity readily took up foreign zooxanthellae and coped better than those that took up only native species of zooxanthellae. These observations will be tested in a controlled experiment as part of this year's workshop. While Baums said she would not release foreign strains of zooxanthellae into the wild, she does think such measures could be beneficial to corals that are maintained in aquaria.

Baums is partnering with Margaret Miller, a scientist with the National Oceanic and Atmospheric Administration (NOAA), who will do the same experiment using corals from Florida, where annual minimum water temperatures are lower. The team will compare corals in the two locations to learn if there are any differences in their abilities to withstand high and low water temperatures. A goal of the research is to find out if current temperature differences between Florida and Puerto Rico will influence the abilities of corals to tolerate future warm-water conditions associated with global warming.

This research and the workshop are funded by the NOAA and the National Science Foundation.

Adapted from materials provided by Penn State.

http://www.sciencedaily.com/releases/2008/08/080826124359.htm

First Prehistoric Pregnant Turtle And Nest Of Eggs Discovered In Southern Alberta

"Although it is relatively rare to find the eggs and babies of extinct animals, it is even rarer to find them inside the body of the mother," says Darla Zelenitsky. (Credit: Photo by Ken Bendiktsen)

ScienceDaily (Aug. 27, 2008) — A 75-million-year-old fossil of a pregnant turtle and a nest of fossilized eggs that were discovered in the badlands of southeastern Alberta by scientists and staff from the University of Calgary and the Royal Tyrrell Museum of Palaeontology are yielding new ideas on the evolution of egg-laying and reproduction in turtles and tortoises.

It is the first time the fossil of a pregnant turtle has been found and the description of this discovery was published today in the British journal Biology Letters.

The mother carrying the eggs was found in 1999 by Tyrrell staff while the nest of eggs was discovered in 2005 by U of C scientist Darla Zelenitsky, the lead author of the article and an expert on fossil nest sites, and her field assistant. Both were found about 85 km south of Medicine Hat in the Manyberries area.

“Although it is relatively rare to find the eggs and babies of extinct animals, it is even rarer to find them inside the body of the mother,” says Darla Zelenitsky, who was also involved in the first discovery of a dinosaur with eggs inside its body.

It was almost by accident that scientists realized that the fossil turtle was pregnant.

"The turtle specimen was partly broken when it was first discovered. It is this fortuitous break that revealed that the fossil was a mother," says François Therrien, a co-investigator of the study and curator of dinosaur palaeoecology at the Royal Tyrrell Museum.

The remains of at least five crushed eggs were visible within the body of the fossil female and a CT scan exposed more eggs hidden under its shell. The turtle, estimated to be about 40 cm long, could have produced around 20 eggs. The nest, which was laid by a different female, contained 26 eggs, each approximately 4 cm in diameter.

Both specimens belong to an extinct turtle called Adocus, a large river turtle that lived with the dinosaurs and resembles today's slider and cooter turtles.

The eggs of Adocus are extremely thick and hard, whereas those of most modern turtles are either thinner or soft-shelled. The thick eggshell may have evolved to protect the eggs from desiccation in dry environments or to protect them from voracious predators during the time of the dinosaurs.

Zelenitsky says the pregnant turtle specimen and the nest shed light on the evolution of reproductive traits of modern turtles, specifically those traits related to their eggs and nests.

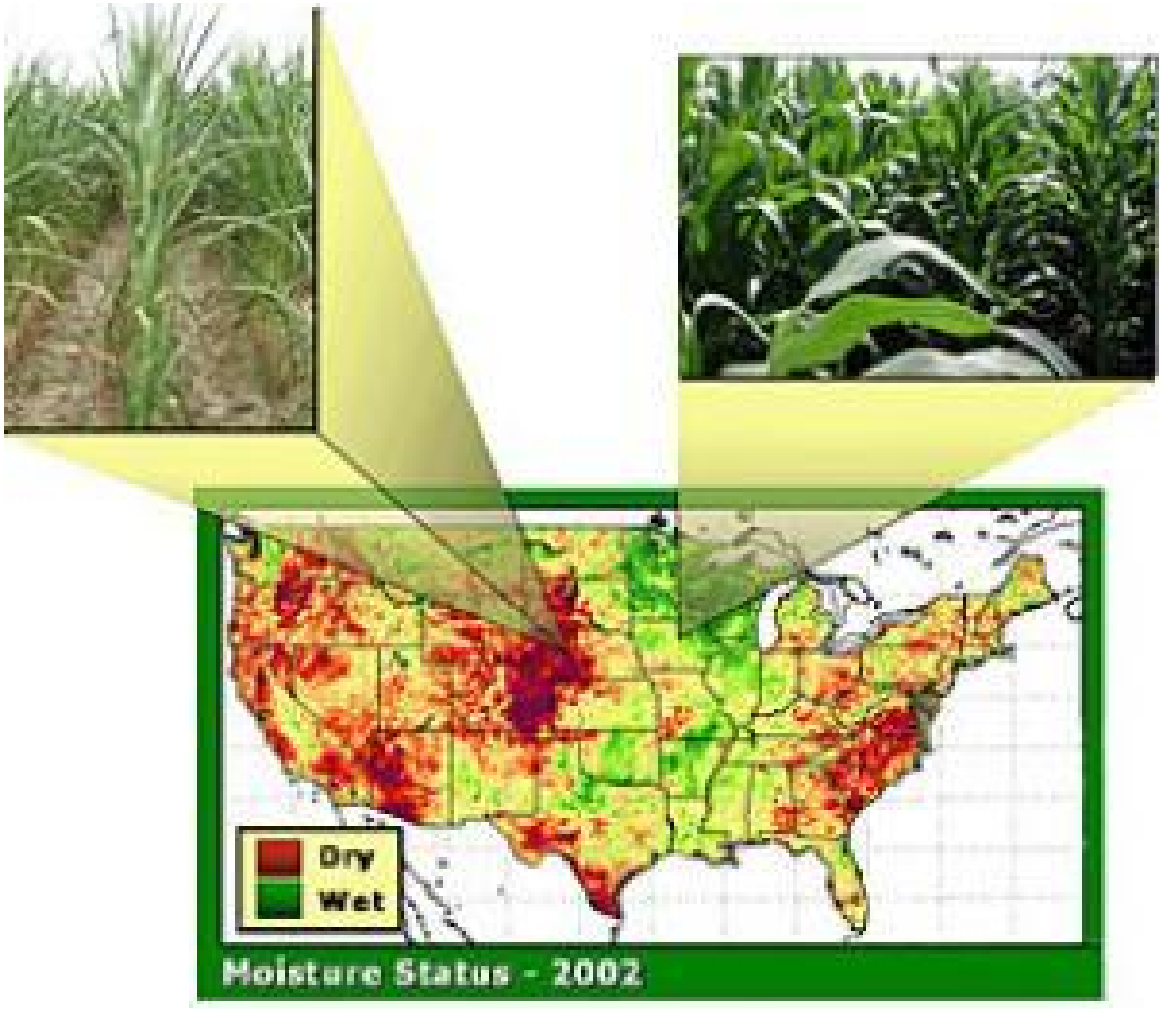
"Based on these fossils, we have determined that the ancestor of living hidden-necked turtles, which are most of today's turtles and tortoises, laid a large number of eggs and had hard, rigid shells," says Therrien.

The fossilized pregnant turtle will be on display at the Royal Tyrrell Museum in Drumheller starting August 29th.

Adapted from materials provided by University of Calgary.

http://www.sciencedaily.com/releases/2008/08/080827152614.htm

Taking Earth's Temperature Via Satellite



Thermal imaging from satellites can be used for monitoring drought and water consumption, administering irrigation projects, and predicting water demand. (Credit: Image courtesy of Martha Anderson, ARS)

ScienceDaily (Aug. 27, 2008) — Imagine adding a thermometer to Google™ Earth. That's the vision of Agricultural Research Service (ARS) scientists Martha Anderson and Bill Kustas, who see the need for high-resolution thermal infrared imaging tools -- such as those aboard the aging Landsat satellites -- as vital to monitoring earth's health.

These thermal data are especially important given the combination of global warming and the growing population's increasing demand for water.

Anderson is a physical scientist and Kustas is a hydrologist at the ARS Hydrology and Remote Sensing Laboratory in Beltsville, Md. Based on remote sensing experiments over the past two decades, Anderson and Kustas see the potential to combine results from a suite of satellites for regional monitoring of evapotranspiration and drought on a daily basis.

As with GoogleTM Earth, users could zoom in from the continental scale to a single field or irrigation operation.

Thermal remote sensing of the earth's land surface and plant canopies from satellites is a valuable way to diagnose water stress and drought conditions. Also, thermal imaging can be used in lieu of precipitation data, providing much-needed information on soil moisture status in data-poor parts of the world.

The ability to map evapotranspiration and soil moisture via satellite has broad applications in monitoring drought and water consumption, administering irrigation projects, predicting water demand, and providing information for hydrological and weather forecast computer models.

Landsat 5 is more than 24 years old; Landsat 7 is 9 years old, but already has operational problems. When the Landsat satellites fail, which could happen at any time, there will be a gap in high-resolution thermal measurements until the National Aeronautics and Space Administration launches its HypspIRI satellite, possibly sometime between 2013 and 2020.

Adapted from materials provided by USDA/Agricultural Research Service. Original article written by Don Comis.

http://www.sciencedaily.com/releases/2008/08/080825201731.htm

Bone Parts Don't Add Up To Conclusion Of Hobbit-like Palauan Dwarfs

A close-up view of the teeth shows their size as well as betel staining -- a red byproduct of chewing betel, an Areca palm nut along with slaked lime and leaf of the Piper betel vine. Betel has slight stimulant and medicinal qualities. (Credit: Photos by Jim Barlow)

ScienceDaily (Aug. 27, 2008) — Misinterpreted fragments of leg bones, teeth and brow ridges found in Palau appear to be an archaeologist's undoing, according to researchers at three institutions. They say that the so-called dwarfs of these Micronesian islands actually were modern, normal-sized hunters and gatherers.

Scientists from the University of Oregon, North Carolina State University and the Australian National University have refuted the conclusion of Lee R. Berger and colleagues that Hobbit-like little people once lived there.

"Our evidence indicates the earliest inhabitants of Palau were of normal stature, and it counters the evidence that Berger, et al, presented in their paper indicating there was a reduced stature population in early Palau," said University of Oregon anthropologist Greg C. Nelson. "Our research from whole bones and whole skeletons indicates that the earliest individuals in Palau were of normal stature but gracile. In other words, they were thin."

Berger, an American-raised paleoanthropologist at the University of the Witwatersrand in Johannesburg, South Africa, stunned archaeologists in March with his claim -- based on skeletal fragments collected from two caves exposed to tidal activity -- that small-bodied humans may have lived in isolation and suffered from insular dwarfism on the islands 1,000 to 3,000 years ago. Berger initially found fragmented human remains while vacationing in Palau, and returned later for excavations under a grant from the National Geographic Society.

Nelson and NCSU anthropologist Scott M. Fitzpatrick, who earned his doctorate at the UO and based his dissertation on Palauan culture, reviewed full skeletal remains and cultural evidence dating back to almost 3,500 years ago. Their Australian co-author Geoffrey Clark also has studied multiple Palauan cultural sites dating to approximately 3,000 years ago.

They argue that Berger, an expert on much earlier humans dating to the Pleistocene, failed to review existing documentation, much of it published by Nelson or Fitzpatrick. Much of their rebuttal comes from remains unearthed by Fitzpatrick and Nelson at Chelechol ra Orrak, only miles from Berger's two sites.

Among these whole remains are bone pieces that match -- some are even smaller that fragments found by Berger -- and come from much larger bodies than those claimed by Berger.

"I think Berger's primary mistakes were his not understanding the variation in the skeletal population in which he was working, using fragmentary remains again in a situation where he didn't understand variation, and stepping outside his own area of expertise, which, I think all scientists try not to do but sometimes we do," Nelson said.

In their paper, Nelson, Fitzpatrick and Clark provide detailed information on the island chain's geography, early migration patterns and cultural history based on a meta-analysis of their own research and studies done by others on the islands.

"Although we have not seen the material that Berger et al base their results on, we can speak to the diversity and normalcy of human skeletal series from throughout the archipelago that have been excavated from several burial caves over the last decade, as well as the an abundance of archaeological, linguistic and historical data indicating a general continuity of cultural traits over a period of three millennia," they wrote in the paper. "Archaeological data also do not suggest a separate isolated group evolving differently (biologically or culturally), although there are subtle differences and changes that occur through time."

Skeletal evidence, Nelson said, reveals three main areas where Berger's conclusions were flawed:

- Berger, as his primary evidence of the existence of small stature humans, pointed to fragments of femoral heads, the round balls atop the body's longest bone that connects it to the hip. Nelson concurs that these heads were often small compared to today's humans but that they connected femurs of modern-sized individuals -- with females averaging about 5-foot, 1-inch in height -- who were slightly built and subsisted off available food sources. At least two femoral heads analyzed by Nelson from full skeletons were smaller than those cited by Berger. Having an intact femur provides a usually accurate starting point for extrapolating body height.
- Berger argued that his fragmentary cranial evidence indicated brow ridges common to very ancient human foreheads (picture those of Neanderthals). Nelson and colleagues argue that all cranial measurements they analyzed point to modern-sized heads. They also noted that limestone dissolved in water -- very common to the island chain's karst environment -- running across bodies buried at or just below the surface will create the easily misinterpreted lumpy appearance on brow ridges.
- Berger said teeth and orthodontia fragments suggested megadontism -- abnormally large teeth, a condition common in the pre-modern, small-bodied hominins that he often studies. Nelson says that large teeth were indeed common in early Palauans but simply reflected a hunter-gatherer society. Smaller teeth evolved as cultures turned to agriculture, he said. "Had [Berger's team] compared their scant dental metric data with those of other regions in the Pacific, or elsewhere in the world, they would have seen that large teeth are not uncommon in early peoples of these regions," Nelson and colleagues wrote.

"One of his biggest mistakes was rushing to publish," Nelson said of Berger. "He did not take the time to understand the area in which he was working -- its entire history, not just the skeletal stuff," he said. "Any time you work anywhere, you have to understand this history. You just can't walk in and cowboy it, pull some stuff out and draw conclusions in the absence of understanding the bigger picture."

Adapted from materials provided by University of Oregon.

http://www.sciencedaily.com/releases/2008/08/080826205936.htm

Men Defy Stereotypes In Defining Masculinity

ScienceDaily (Aug. 27, 2008) — Contrary to stereotypes about sexual performance and masculinity, men interviewed in a large international study reported that being seen as honorable, self-reliant and respected was more important to their idea of masculinity than being seen as attractive, sexually active or successful with women.

The study published in the Journal of Sexual Medicine included interviews with more than 27,000 randomly selected men from eight countries (Germany, U.S., U.K., Spain, Brazil, Mexico, Italy and France), with about 16 percent of the men reporting erectile problems.

Regardless of age or nationality, the men more frequently ranked good health, harmonious family life and good relationships with their wife or partner as more important to their quality of life than material, self-fulfilling or purely sexual concerns. There was no significant difference in rankings of masculinity and quality of life characteristics between men who experienced erectile dysfunction and those who did not.

The study, part of the Men's Attitudes to Life Events and Sexuality (MALES) project, aimed to determine characteristics of masculinity and quality of life in men with and without self-reported erectile dysfunction, and how those ideas of masculinity might affect seeking help and treatment.

"Many meanings, positive and negative, are attached to the term, 'masculinity,'" said Julia Heiman, director of The Kinsey Institute at Indiana University and an author of this study. "To ask a large sample of men what comprises their own sense of masculinity is very useful for both the media and for research. These results suggest we should pay attention and ask rather than presume we know."

Findings of the study include:

- Overall, being seen as honorable was considered the most important quality in the construct of masculinity.
- Compared to men without erectile dysfunction, the experience of erectile dysfunction neither increased nor decreased the importance men placed on having an active sex life or having success with women, although men with erectile dysfunction reported less satisfaction with their sex lives.
- Men who seek treatment for erectile dysfunction do not differ in their views of masculinity from those who do not seek help.
- "Being seen as a man of honor" was cited as the most important attribute of masculine identity in Spain, Brazil, Mexico, United States and France, while "being in control of your own life" was the most important in Germany, the United Kingdom and Italy.
- The findings emphasize that men across cultures and ages value couple relationships over purely sexual pleasure and indicate that men are particularly concerned about their partnered relationships, whether or not they report erectile dysfunction.

Co-authors include lead author Michael S. Sand, Boehringer-Ingelheim Pharma. Inc., Ridgefield, Conn.; William Fisher, University of Western Ontario, London, Ontario, Canada; Raymond Rosen, New England Research Institutes, Watertown, Mass.; and Ian Eardley, M.D., St. James's University Hospital, Leeds, United Kingdom.

Adapted from materials provided by Indiana University.

http://www.sciencedaily.com/releases/2008/08/080826190950.htm

Is Extinction Or Diversity On The Rise? Study Of Islands Reveals Surprising Results

In New Zealand, there were about 2,000 native species of plants, the researchers noted. Since colonization, about 2,000 new plant species have become naturalized. Over the same period, there have been few plant extinctions, so the net effect is that humans have transformed New Zealand's landscape by bringing in many new species. (Credit: iStockphoto/Richard Goerg)

ScienceDaily (Aug. 27, 2008) — It's no secret that humans are having a huge impact on the life cycles of plants and animals. UC Santa Barbara's Steven D. Gaines and fellow researcher Dov Sax decided to test that theory by studying the world's far-flung islands.

Their research, published this month in the Proceedings of the National Academy of Sciences, sheds surprising light on the subject of extinction rates of species on islands. The paper, "Species Invasions and Extinction: The Future of Native Biodiversity on Islands," is one in a series of reports by this team studying how humans have altered the ecosystems of the planet.

Gaines and Sax started the project with a question: What effect are humans really having on biological diversity? "The presumption at the time was that we are driving biodiversity to lower levels," said Gaines, who directs UCSB's Marine Science Institute. "Certainly, if you think about it at the global level, this is true because humans have done a lot of things that have driven species extinct."

However, when studied on the smaller scale of islands, the findings showed something completely different. Diversity is on the rise – markedly so in some instances. Diversity has gone up so dramatically that it might cause some to wonder if the health of the ecosystems might not be better because the number of species is twice as high as it used to be. But it's not that simple, Gaines said.

"What Dov and I worked on a few years ago is the fact that the vast majority of introductions (of species) don't have large negative effects," Gaines said. "Indeed, most species that get introduced don't have much effect at all. It doesn't mean that they're not altering the ecosystem, but they're not driving things extinct like some of the big poster-child stories we've been hearing about."

Still, the study showed that human colonization has had a massive impact on ecosystems of islands, with the introduction of new, exotic plants and animals. In New Zealand, for example, there were about 2,000 native species of plants. Since colonization, about 2,000 new plant species have become naturalized. Over the same period, there have been few plant extinctions, so the net effect is that humans have transformed New Zealand's landscape by bringing in so many new species.

Sax, a former postdoctoral researcher at UCSB who is now assistant professor of ecology and evolutionary biology at Brown University, did much of the fact-finding for this report by painstakingly digging through data that had been collected over hundreds of years on islands around the world. "This is Dov's specialty," Gaines said. "Finding really old data sets that are very interesting."

"The dramatic increase in the number of species has changed how the system functions," Sax said. "Changing the abundance of natives versus exotics affects all of the other species that used to depend on the natives for food or shelter. So, it's not in any way to say that increasing biodiversity is a good thing."

With birds, it's a different story. The number of bird species on islands today is almost exactly the same as it was prior to human colonization, but the species of birds on the islands are very different. About 40 percent of the species of birds that you find on islands today are introduced species, Sax said, which means that a comparable number of birds has gone extinct. "In the case of birds," he said, "lots of extinctions, no change in total biodiversity."

All of this caused Gaines and Sax to ask new questions:

• Are the islands undersaturated? Can you still keep throwing species in there, with the result that nothing is going to happen?

• Are they now oversaturated? Are there limits in how many species an ecosystem can hold?

• Are we building an extinction debt? "Which means," Gaines said, "that by going in and mucking up the system, we may have already created the setting where too many species have been packed in, and we just haven't waited long enough to see these extinctions start to happen.

"The whole point of this study was to start looking down the path to see which of these wildly different scenarios might be right," Gaines added. "We haven't nailed the answer yet, but we've set the stage for answering whether islands are now saturated or not."

What made the research possible was that many of the explorers who colonized the islands included naturalists on their boats. From the time they landed on the islands, the naturalists were busy cataloging and documenting the plants and animals of each colony.

"It was very surprising to find such a strong correlation between the number of native and exotic plant species on islands around the world," Sax said. "In ecological research, a ‘strong' correlation often explains 50 percent of the variation. Here, the correlation between native and exotics explains almost 100 percent of the variation. In other words, if you know how many native plants are on an oceanic island then you can predict almost perfectly how many exotic plants are there."

The study, which took a year and a half, included islands such as Lord Howe Island east of Australia and Tristan da Cunha, a group of remote volcanic islands in the south Atlantic Ocean, among others.

"These were all oceanic islands," Gaines said, "which means islands that are far enough away from a continent that they're not getting regular exchanges with the mainland."

Journal reference:

1. Dov F. Sax and Steven D. Gaines. **Colloquium Paper: Species invasions and extinction: The future of native biodiversity on islands**. *Proceedings of the National Academy of Sciences*, 2008; DOI: 10.1073/pnas.0802290105

Adapted from materials provided by University of California, Santa Barbara.

http://www.sciencedaily.com/releases/2008/08/080826173227.htm

Bones Get Mended With High Tech Glass-of-milk

ScienceDaily (Aug. 27, 2008) — Scientists at the new Nuclear-Magnetic Resonance unit at the University of Warwick have discovered how a high-tech glass of milk is helping bones mend.

Low temperature Bioglass is used to help fix broken bones, but until now no-one has been able to understand the process.

Using a strong magnetic field to 'see' into the bones researchers saw calcium rush into the bioglass in the first hour of implantation.

Physicist Professor Mark Smith explains: "Bioglass is used to help mend broken bones. Recently researchers working at Imperial College discovered a new kind of bioglass which seemed to work better, but they could not work out all the details why.

"We looked at it through our NMR machine and were amazed by what we saw. Fluid simulating patient's bodies rushed calcium out of the bioglass and then into the new bones. It seems perhaps a glass-of-milk-a-day really is what the doctor ordered."

The new Bioglass uses chemicals rather than heat to form the replacement bones. The University of Warwick worked with Imperial College and Kent University of the project.

Adapted from materials provided by University of Warwick.

http://www.sciencedaily.com/releases/2008/08/080826100831.htm

How Diet, Antioxidants Prevent Blindness In Aging Population

Researchers at Brigham Young University and Weill Medical College of Cornell University discovered a link between two processes in the retina that, in combination, contribute to a disease called macular degeneration. (Credit: Image courtesy of Brigham Young University)

ScienceDaily (Aug. 27, 2008) — A new study reveals part of the magic behind a diet rich in antioxidants, showing how artichokes, blueberries and pecans can hold at bay the leading cause of age-related blindness in developed countries.

Researchers at Brigham Young University and Weill Medical College of Cornell University discovered a link between two processes in the retina that, in combination, contribute to a disease called macular degeneration. They found antioxidants disrupt the link and extend the lifetime of irreplaceable photoreceptors and other retinal cells.

"The implication is that people at risk of macular degeneration could help prevent the disease by consuming antioxidants," said Heidi Vollmer-Snarr, a BYU chemist who earned a doctorate from Oxford and began work on this disease as a postdoctoral researcher at Columbia.

Age-related macular degeneration affects more than 1.75 million people in the United States. With a rapidly aging population, that number will rise to 3 million by 2020. People struck with the disease first lose central vision and temporarily adjust by relying more on peripheral vision. Some eventually lose their vision entirely.

Dr. Paul Bernstein of the University of Utah's Moran Eye Center says understanding the exact mechanisms of macular degeneration has remained elusive. Bernstein was not involved in the study.

"This work by Dr. Vollmer-Snarr and colleagues ties these two damaging processes together and demonstrates the harm they cause in combination is much more than would be expected," Bernstein said. "This new knowledge suggests the possibility of interventions which could prove to be powerful ways to prevent or delay age-related macular degeneration."

The new study finds a destructive synergy between the buildup of a compound called A2E and damage to cellular "power plants" called mitochondria. A2E is a natural byproduct of cellular activity that, unlike other compounds, won't break down or be disposed by the body.

A problem occurs when A2E encounters oxidative stress created by light exposure. In these circumstances, A2E disrupts energy production in mitochondria. The resulting energy shortage pulls the plug on daily cleaning and maintenance of photoreceptors and another type of retinal cell.

The result is more A2E buildup, and the cycle of destruction hastens the death of these vital visual cells, which are not replaced when they die. The experiments performed with visual cells from rats, cows and humans showed that antioxidants could completely counter the damage.

Seeing this process play out in the retina has given Vollmer-Snarr a novel idea for attacking harmful growths in the body. The strategy would involve delivering potentially disruptive compounds like A2E to the target and then using light to trigger the damage.

"Why not take a page out of one disease's book in the fight against other diseases?" Vollmer-Snarr said.

BYU graduate student Junping Gao is also a co-author on the study. Joining as co-authors are Cornell medical researchers Silvia C. Finnemann, Cristofol Vives-Bauza, Monika Anand, Arash K. Shirazi, Jordi Magrane and Giovanni Manfredi.

The study is online and will be published September 5 in the Journal of Biological Chemistry.

Adapted from materials provided by Brigham Young University.

http://www.sciencedaily.com/releases/2008/08/080825203550.htm

Stick With Simple Antibiotics For Pneumonia To Avoid Super Bugs, Says Researcher

ScienceDaily (Aug. 27, 2008) — Australian hospitals should avoid prescribing expensive broad-spectrum antibiotics for pneumonia to avoid the development of more drug-resistant super bugs, according to a University of Melbourne study.

The study, by PhD researcher and Austin Health Infectious Diseases consultant, Dr Patrick Charles, shows that only 5 per cent of people admitted to hospital with community-acquired pneumonia had infections caused by organisms that could not be successfully treated with penicillin combined with an "atypical" antibiotic such as doxycycline or erythromycin.

In the world's largest study of its kind, Dr Charles studied almost 900 people admitted to six Australian hospitals over 28 months from 2004 to 2006.

Dr Charles' research analysed samples of blood, urine, sputum and viral swabs of the nose and throat taken from 885 patients at the Austin, Alfred, Monash and West Gippsland hospitals in Victoria, the Royal Perth Hospital and Princess Alexandra Hospital, Brisbane.

He found that most cases of pneumonia were caused by easy to treat bacteria such as the pneumococcus or Mycoplasma, or alternatively by respiratory viruses that do not require antibiotic therapy.

Only five per cent of cases were caused by organisms that would require more expensive and broad-spectrum antibiotics, and these cases were nearly all in patients who'd had frequent hospital admissions or were residents of nursing homes.

"The study results show that current Australian guidelines for prescribing antibiotics for pneumonia are appropriate," Dr Charles said.

"It shows that Australian doctors should resist the push which is occurring in some parts of the world – particularly the US - to prescribe broad spectrum antibiotics to treat essentially all possible causes."

Dr Charles said the trend towards broad-spectrum antibiotics was being driven by laboratory-based studies of resistance rates in bacteria sent to the labs, rather than clinical studies of patients with pneumonia.

In the laboratory-based studies, the bacterial isolates often come from highly selected patients with more difficult to treat disease.

In addition, the fear of litigation made some doctors unnecessarily opt for more aggressive treatments.

However, the more frequently these broad-spectrum antibiotics were used, the more likely it was that bacteria would be become resistant to them.

"The emergence of antibiotic-resistant bacterial pathogens is one of the biggest threats to Australian health care standards and is closely linked to the inappropriate use of antibiotics," Dr Charles said.

"By continuing to use more traditional antibiotics to treat most cases of pneumonia, Australian doctors can limit or delay the emergence of more resistant strains of bacteria.

"By using the broad-spectrum antibiotics less often, we can also prolong the effective lifespan of these drugs.

"Furthermore, in the US, Canada and some parts of Europe, they are seeing some serious complications which appear to be related to the overuse of some classes of broad-spectrum antibiotics that are frequently used there to treat respiratory infections."

Dr Charles is a physician in Infectious Disease and General Medicine at the Austin Hospital in Melbourne. He is also an Honorary Lecturer in the University of Melbourne's Department of Medicine at the Hospital.

His study was recently published in the journal Clinical Infectious Diseases and he will be conferred with a PhD for his research tomorrow (27 August) at the University of Melbourne.

He received funding from the independent 201CC Research Fund to complete the study.

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

http://www.sciencedaily.com/releases/2008/08/080826124405.htm

Trouble Quitting? New Smoking Study May Reveal Why

ScienceDaily (Aug. 27, 2008) — A new study from researchers at the University of Pittsburgh and Carnegie Mellon University sheds light on why smokers' intentions to quit "cold turkey" often fizzle out within days or even hours.

If a smoker isn't yearning for a cigarette when he makes the decision to kick the habit-and most aren't-he isn't able to foresee how he will feel when he's in need of a nicotine buzz. The new study bolsters the theory that smokers not in a state of craving a cigarette will underestimate and underpredict the intensity of their future urge to smoke.

"We have observed previously that the idea of smoking a cigarette becomes increasingly attractive to smokers while they are craving," said the study's lead investigator and University of Pittsburgh professor of psychology Michael Sayette. "This study suggests that when smokers are not craving, they fail to appreciate just how powerful their cravings will be. This lack of insight while not craving may lead them to make decisions-such as choosing to attend a party where there will be lots of smoking-that they may come to regret."

The study looked at the cold-to-hot empathy gap-that is, the tendency for people in a "cold" state (not influenced by such visceral factors as hunger, fatigue) to mispredict their own behavior when in a "hot" state (hungry, fatigued), in part because they can't remember the intensity of their past cravings.

The researchers gathered 98 male and female smokers for two experimental sessions and placed them in one of three groups: "hot," "cold," and a comparison group. Those in a "hot" state were asked to abstain from smoking for 12 hours prior to Session 1 and then were induced to crave a cigarette by holding, but not smoking, a lit one.

Those in a "cold" state smoked up until Session 1 began and did not hold a lit cigarette. The comparison group did not attend Session 1.

During Session 1, "hot" and "cold" participants were asked to indicate the minimum amount of money they would need to delay smoking for five minutes in Session 2, when all participants would be in a "hot" state. Smokers in all three groups were required to abstain from smoking for 12 hours prior to Session 2 and would experience the lit cigarette cue described above.

During Session 2, when the subjects in all three groups were craving, they were given the chance to revise the amount of money they would need to delay smoking for five minutes. As expected, the "cold" smokers from Session 1 now significantly increased the amount of money they would need to delay smoking for just five minutes, while those originally in a "hot" state during Session 1 did not request an increase.

The study participants from the "cold" group were much less likely to accurately predict the amount of money they would need to put off lighting up. In fact, in Session 2, nearly half of the "cold" smokers requested an amount of money higher than what they had initially predicted, while only a quarter of the "hot" group did the same.

"These findings suggest that smokers are likely to underpredict their own future desire to smoke when they're not craving a cigarette," said study coauthor George Loewenstein, the Herbert A. Simon Professor of Economics and Psychology at Carnegie Mellon.

"The research not only has implications for helping smokers quit, but it also enlightens us on how nonsmokers may pick up the habit. If smokers can't appreciate the intensity of their need to smoke when

they aren't currently craving, what's the likelihood that people who have never smoked can do so," said Loewenstein.

Journal reference:

1. . **Exploring the Cold-to-Hot Empathy Gap in Smokers**. *Psychological Science*, September 2008

Adapted from materials provided by University of Pittsburgh.

http://www.sciencedaily.com/releases/2008/08/080826144852.htm

When IM Is the Best Way to Stay on Top

It's tough to keep up on your workload, whether you're a faculty member responsible for several classes or a student juggling a full schedule. The logistical dance becomes even more daunting for those learning remotely — from computers hundreds of miles away, or another campus in the same college system.

Yet those are everyday problems for students and instructors at large, sprawling community college systems, especially those that offer a significant portion of their courses online. The country's largest singly accredited system, Ivy Tech Community College, in Indiana, thinks the solution is already staring many of its students in the face: instant messaging, hardwired into every teenager since the heyday of America Online.

The community college system, which serves more than 115,000 students a year on 23 separate campuses across the state, adopted an instant messaging platform called Pronto, from the collaborative learning software company Wimba. Like a turbocharged AOL Instant Messenger or Google Talk, it lets students chat online with their professors in text, audio or video form, for virtual office hours or impromptu question-and-answer sessions.

Unlike the free IM clients students are already familiar with, though, the software integrates with existing course management systems, such as Blackboard and Moodle, so that their buddy lists are populated with the classmates already signed up for a specific course. Students also see each other's real names, with identities that are validated through the system — no "sk8rdude21″ who may or may not be your group partner — and they can save their chats for later consultation.

"I use it for my online office hours, I have it on whenever I'm at a computer; I helped at least eight students last night after midnight," said Bonnie Willy, an assistant professor in Ivy Tech's computer information systems and computer information technology department. "It's there. It dings when they come in so you can hear it. My cat's trained, so whenever it dings she comes and gets me."

Instant messaging, ubiquitous as it remains in many students' social lives, has yet to catch on in a big way as an official means of communication in the university setting. Grand Rapids Community College, with over 14,000 students in Michigan, and Arizona State University, among others, use Pronto. But Ivy Tech's example — unusual on such a wide scale — illustrates the possibilities of using IM at a community college with a large number of distance learners spread across many campuses.

At institutions like Ivy Tech, it's easy for students — many of whom are nontraditional and most of whom don't live near campus — to remain part of the faceless procession churning in and out of the institution. Many educators see one-on-one contact as an important part of keeping them engaged, with office hours seen as a central front in the struggle to boost retention — enough that Pronto is not the only software package to emerge as a potential solution.

"To me, the real key is it just provides a platform for students to remain in close contact with faculty," said Idris Smith, an adjunct instructor who teaches a course on integrated medical office systems at Ivy Tech's Richmond campus. "Hopefully, too, it will help me hang on to those students who kind of get lost along the way. Hopefully, I'll catch them online sometime and we'll talk about where they're at," and make sure they don't "get behind in assignments, too."

Ivy Tech rolled out Pronto about a year ago, said Kara Monroe, executive director of the college's Center for Instructional Technology. Since then, the institution has upgraded to a new version that incorporates video conferencing and file sharing capabilities. Until now, most faculty members have used mainly the text-based features, she said, but she expects that to change as the new features become better known.

Use of the platform is spreading organically. A bit over 8,000 users are registered with Pronto, most but not all of whom are distance learners or students taking a class from a remote campus. (Over 23,000 students are enrolled in the more than 2,000 available online courses, including hybrid courses and video feeds to classes held on campus.) That number also includes instructors from among the 833 so far who have Blackboard accounts, Monroe said.

Its use is expanding steadily, she added, with an average of 215 new accounts a month, either because some faculty members require it or students encourage their instructors to adopt it. Beyond facilitating interactions between students and their instructors, Monroe noted that instant messaging is becoming a useful tool for students to keep in touch with classmates on their own — and for faculty to stay connected among themselves, too.

Not all institutions that want instant messaging functionality turn to a professional academic solution. Even at Ivy Tech, Monroe noted, instructors and students used to swap AIM or Google screen names (sk8rdude21, anyone?) for out-of-class communication. "We've actually been doing that for years," she said. But other colleges looking for similar functionality have turned to Wimba and other providers for more integrated solutions, including Blackboard itself, which includes the text-based Collaborative Tools. Other colleges, focusing on virtual office hours, have opted for software packages like Elluminate Live!.

Some instructors, like Smith, have built Pronto into the very structure of their courses, requiring their students — in her case, all distance learners — to download the necessary software in the first week of the semester. It's "just much quicker than sending e-mails back and forth," Smith said. "I'll have sessions during the semester where they actually have to be online during a specific week."

But one drawback, she pointed out, is that relying on IM as a chief means of communication disadvantages distance learners who don't have their own computers at home and work instead from labs on campus or the public library. It's important, she acknowledged, to "be kind of careful, too, in that we're not creating an additional technology gap there."

— Andy Guess

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/08/29/im.

Does Silicon Valley Face an Innovation Crisis?

By CLAIRE CAIN MILLER

UPDATED with clarification on Ms. Estrin's latest company

Judy Estrin, who has built several Silicon Valley companies and was the chief technology officer of Cisco Systems, says Silicon Valley is in trouble. In a new book, "Closing the Innovation Gap," which will be in bookstores Tuesday, she writes that the valley's problems are symptomatic of a crisis in innovation facing the country as a whole.

In an interview in her Menlo Park office Thursday, Ms. Estrin said that the United States is stifling innovation by failing to take risks in sectors from academia to government to venture capital. "I'm not generally an alarmist, but I am really, really concerned about this country," she said.

In her book, Ms. Estrin discusses everything from problems in elementary education to drug development, but her expertise is in information technology. Beginning in 1981, she co-founded three tech companies: Bridge Communications, Network Computing Devices and Precept Software. In 1998, Cisco acquired Precept and appointed her chief technology officer. She left in 2000 and co-founded Packet Design. She is now chief executive of JLABS.

Ms. Estrin traces Silicon Valley's troubles to the tech boom. She said that's when entrepreneurs and venture capitalists started focusing more on starting companies to turn around and sell them and less on building successful companies for the long term.

"Starting in 1998, there was such a shift in Silicon Valley toward chasing money and short-term returns," she said.

Part of the reason, she said, was that Cisco and other fast-growing big companies started acquiring start-ups with innovative technologies instead of developing new ideas internally. Entrepreneurs began founding companies with the goal of selling to a big tech company, and venture investors encouraged that.

Ms. Estrin acknowledged that innovative ideas still appear all over Silicon Valley. But, she said, the technologies at the root of new products like Apple's iPod or the Facebook social networking service were actually developed several decades ago. If entrepreneurs do not continue to develop groundbreaking technology, she said, the valley will be in dire straits in another decade. She compared the situation to a tree that appears to be growing well, but whose roots are rotting underground.

"In some ways, we have the problem that it looks like innovation is flourishing, but too much of it is short-term, incremental innovation," she said.

Since the tech bust, she said, venture investors have been too cautious. "What venture capitalists should do is start taking more risks again," she said. "Taking risks and failing is one of the most critical aspects of innovation."

The successes of her own career would not be possible in the current environment, she surmised. "The environment that was so rich and helped me start my career really is not there for my son," she said.

http://bits.blogs.nytimes.com/2008/08/28/does-silicon-valley-face-an-innovation-crisis/index.html?th&emc=th

Change Arrives on Tiptoes at the Frick Mansion

By ROBERTA SMITH

Time doesn't quite stand still at the beloved Frick Collection, but you could call the pace of change there glacial without fear of correction. "We don't move things just to move things," said Colin B. Bailey, who became the Frick's senior curator eight years ago. "We take great care to respect the spirit of the place."

Just now, though, for a brief moment, the place is topsy-turvy, or as topsy-turvy as the Frick ever gets. Paintings have been moved around. A carpet has been taken up. There's a new piece of majolica in the Enamels Room. And the museum's three Vermeers are being shown together on one wall for the first time in a decade.

Yet despite an increasing number of special exhibitions, some things in Frick World have remained pretty much unchanged since the museum opened in 1935. One room harks back even further, to the years just before Henry Clay Frick's death, when he built and furnished this mansion with the intention that it would eventually be a public museum. This is the grand living room, or Living Hall, which can give rise to one of New York's great art-and-power epiphanies.

Thick with furniture and carpeting, the room has a built-in hush, a soothing green tonality and six paintings that form an amazing cohort. El Greco's otherworldly "St. Jerome" has a spot over the fireplace, flanked by Hans Holbein the Younger's portraits of Thomas Cromwell and Thomas More. On the opposite wall is the Venetian master Giovanni Bellini's magisterial "St. Francis in the Desert" from around 1480. It is flanked by Titian's portrait of Pietro Aretino and his mellifluous "Portrait of a Man in a Red Cap." Altogether this room is a prime example of robber baron luxe. Frick, a steel magnate, was at one time called "the most hated man in America," and not for nothing. But the room is also a stunning

testament to his passion for painting and perhaps, like the rest of his museum, even of a desire for atonement achieved by doing some public good.

For more than 90 years five of these paintings never left their perches; the El Greco was moved briefly to the Frick's Oval Room in 2001 for a small El Greco show. But last year it could no longer be denied that the 90-year-old carpet was worn out. Replacing it would require removing all the furniture, which led Joseph Godla, the Frick's conservator, to suggest also removing the paintings so the floors could be finished and the wood-paneled walls waxed.

And so for the last two weeks and through this weekend the Living Hall's masterpieces have been hanging in the Oval Room, free and clear of furniture, closer to eye level and bathed in natural light. Meanwhile a replica of the original carpet, made by the carpet manufacturer V'soske (which made the original), went down two days ago in the Living Hall, which will be open to the public this weekend to ease traffic flow.

In Frick time the chance to see the Living Hall all but empty and its contents in a completely different context is little short of radical and not likely to happen again until the new carpet wears out. Such intimate face time with the paintings is, of course, especially rewarding, and, incidentally, makes you more aware of the usual careful syncopation of their arrangement in the Living Hall.

Dating from the late 15th to the late 16th centuries, these works span an amazingly active period in the history of painting. For one thing, they present an almost classic opposition of tight and loose surfaces. The gleaming meticulous oil-on-panel surfaces of the Holbeins and the St. Francis play off the soft but commanding brushiness of the El Greco and Titian canvases.

"St. Francis in the Desert" is arguably Bellini's greatest painting and an indelible staple of Art History 101. Getting close to its enamel-like surface and sweeping yet detailed landscape always provides a jolt, and here you can get closer than ever. The setting is a panoramic rendering of a busy, seemingly Northern Italian landscape that includes carefully tended fields, a donkey, a flock of sheep with its outsize shepherd and hill towns receding in the distance. Everything seems to pause as St. Francis stands ready on unlikely pale blue rocks in the foreground, with open hands and skyward gaze. The stigmata of Jesus are about to arrive. The intense blue sky — the picture's most vivid color — seems to burn with the promise of heavenly reward. Seeing this painting in the Oval Room reveals details you may have missed: the rabbit nestled in a hole in the wall, just beneath St. Francis's left hand; a little twig of a tree just behind him, whose spindly branches form a delicate cross at what appears to be the composition's exact center.

In contrast El Greco's tall rendition of "St. Jerome" is an Everest of brushy, stroke-by-stroke fabulousness: his dark pink Cardinal's robes, white red-trimmed cuffs, elongated hands planted lightly on an open Bible. Everything seems subtly alive, with the face being the most fluid point. St. Jerome's look is quizzical, his lips are slightly parted. He could be on the verge of delivering a stern bit of wisdom or about to think out loud.

To my embarrassment, another aspect of these paintings that only occurred to me when they changed rooms is that they are all portraits of men, some of them great men, the kind of men that Frick would have wanted to be associated with. Each portrait represents, in its very form and execution, a manly attribute that Frick would probably have liked to think he possessed: the noble devotion of St. Francis, the benign erudition of St. Jerome, the firmness of Holbein's More. (If ever a face expressed the courage of its owner's convictions, it's More's, who chose to be beheaded rather than recognize the divorced Henry VIII as the leader of the Church of England.)

Holbein's almost desiccated portrait of the much slyer Cromwell reflects ruthless pragmatism, while the study in browns and golds that is Titian's Aretino depicts a bullish man whom the Frick handbook describes as "an author of scurrilous verses" who "acquired great wealth through literary flattery and blackmail." His strength is emphasized by the heavy chain around his neck. Finally Titian's "Portrait of a

Man in a Red Cap," which introduces a handsome youth in a wide ermine collar that benefits especially from the Oval Room's natural light, is the aesthete made beautiful (redeemed) by his love of the arts.

See it while you can. By Wednesday afternoon, the Frick says, both the Living Hall's furniture and its paintings will be back in their usual places, and life will go on. But there are other longer-lasting changes worth noting.

Last fall the Fragonard Room got new lighting, which upped the wattage of this artist's six-panel "Progress of Love" substantially. The new brightness suggests that the clandestine flirtations of the porcelainlike damsels and gentlemen are no match for the persistent suggestiveness of voluminous, erupting foliage and not-so-frozen-looking garden statuary.

The Frick has acquired its first work of majolica, a large, radiant dish depicting "The Judgment of Paris" from around 1565 that is a gift from Dianne Dwyer Modestini in memory of her husband, Mario Modestini. At the moment it can be seen in the small Enamels Room, holding its own against the gleaming dark greens and blues of the Limoges enamels that Frick bought from the estate of J. P. Morgan. The dish's glazes are laid on in fresh little strokes (as if with a tiny felt-tip marker) that makes the colors dance. And while the dramatic action by which Zeus, Paris and Aphrodite set the Trojan War in motion take the most space, the liveliest visuals are provided by impish grotesques on the white-ground border and the bits of green gold-sprinkled grass below and the ochre-tinged clouds above.

And then there are the three Vermeers grouped in the South Hall. The large luminous "Mistress and Maid" outshines two smaller, mousier works: "Officer and Laughing Girl" and "Girl Interrupted at Her Music." Each shows a man and a young woman in an interior, and suggest that Vermeer was at his best when he painted women. There have been other incremental changes at the Frick, some visible in the galleries, some not. The most significant permanent change, subtle by the standards of most museums, occurred about five years ago under Mr. Bailey's guidance. The West Gallery was liberated from the stanchions that created its distinctive race-track-like circuit. It became possible to look at the paintings while backing away from them and to see some of the room's small bronzes (also from Morgan) from all sides. And the search is on for the Frick's first curator of decorative arts, which means that we will be learning more about that side of Frick's acquisitions in the future, starting with the 18th-century tapestry-covered love seats and chairs in the Fragonard Room, I hope.

Still, not all change is welcome. I for one would like to see Ingres's 1845 "Comtesse d'Haussonville" taken from its cramped quarters in the North Hall and returned to its rightful, regal place at the center of the east wall of the East Gallery. There it was featured, essentially, as the last work in what remains an astounding march through European painting. The countess's quietly imperious gaze could engage the eye almost from the Enamels Room, through the wide doorways of the Oval Room and the long West Gallery. It would be great to see her there today, a presence nearly equal to six men.

The exhibition of paintings in the Oval Room is on view through Sunday at the Frick Collection, 1 East 70th Street, Manhattan, (212) 288-0700, www.frick.org.

http://www.nytimes.com/2008/08/29/arts/design/29fric.html?_r=1&th&emc=th&oref=slogin

Palm-Leaf Offerings From Ancient India

By HOLLAND COTTER

In West Bengal and Orissa in eastern India, palm-leaf paintings are common and cheap. Made from long, thin strips of dried leaves threaded together to fold up accordion-style, most have a single large image — of Ganesha, say, or Sarasvati, the goddess of books and knowledge — dashed off in fleet strokes.

The pictures are turned out by the thousands for tourists and they make ideal souvenirs. Sturdy and compact, they weigh next to nothing. The collapsible format protects them from dirt and light. Toss a dozen paintings in your luggage and the problem of finding all-purpose gifts for the folks back home is solved.

Such practical features — size, resilience, portability — help explain why a similar form of palm-leaf art, the illustrated book, was popular in India between the 10th and 13th centuries. And they suggest why such books and their illustrations have survived into the present, while painting in more perishable media has not.

Even these books, though, are rarities. Of the huge numbers that must have once existed, only a fraction remain. And few of these are as finely done and pristinely preserved as the examples in the small show "Early Buddhist Manuscript Painting: The Palm-Leaf Tradition" in the South Asian galleries at the Metropolitan Museum of Art.

The earliest Buddhist palm-leaf books originated in northeastern India, in what is now Bihar; West Bengal; and Bangladesh. Their components were simple: talipot palm leaves — cut, boiled and dried — and a palette of organic pigments limited to red, yellow, blue, green, black and white.

The palm-leaf sheets varied in length, but were seldom more than a few inches wide. They were stacked like slats in Venetian blinds and bound by threads passed through two holes in the center of each sheet. Rather than forming a single surface, as in modern palm-leaf paintings, the sheets in books were meant to be seen one at a time.

The sequence for viewing them was determined by the flow of an inscribed text, which was punctuated with tiny paintings. The image of Maitreya, the Buddha of the future, accompanied by a female disciple on a leaf at the Met, is an example.

Just under three inches high, it's packed with detail. Each figure is dressed, as if for a hot summer day, in beaded see-through attire. The disciple, her skin a mango gold, smiles up at her savior while he makes a coy gesture with his hands as if playing a game of shadow puppets for her amusement.

All the palm-leaf manuscripts we know of are religious books, transcriptions of Buddhist scriptures, or sutras. A few sutras were favorites, and by far the most frequently copied one was "Ashtasahasrika Prajnaparamita," or "Perfection of Wisdom in 8,000 Verses."

Said to have been written — or spoken — by the Buddha himself, it was more likely compiled over centuries. Like many texts generated by an ardently proselytizing faith, it simultaneously had its head in the clouds and was down to earth.

On the one hand, the sutra defines wisdom as a transcendent consciousness, a state of ego-erasure so profound that the reality of emptiness as the ultimate fact of life becomes clear. To reach this understanding was the goal of monastic practice. It was to gain Buddha-level knowledge, which was the knowledge you needed to gain before you could do the one thing worth doing, which was to help others in need.

Balanced against this high-minded goal was another. "Perfection of Wisdom" also implied that a smart devotee might use the sutra as a kind of existential survival kit, a magical talisman. With its help you could ward off illness, accidents and other material harm. And you could acquire things: money, a spouse, an extra cow, healthy children, and lots of them.

So palm-leaf manuscripts, like most art, had multiple uses. They circulated spiritual information. They functioned as protective charms. They served as religious offerings, gifts from which karmic returns were expected. And they became objects of worship.

Prajnaparamita was not only a form of wisdom, but also a female deity who had roots in ancient goddess worship and was identified with the Buddha's mother. The sutra itself explains that if the Buddha is kind enough to give you a book like this, you should "revere, adore and worship it with flowers, incense, unguents, parasols, banners, bells, flags and rows of lamps all around."

Such exalted copies of "Perfection of Wisdom" were doubtless lovingly preserved and pampered in temple treasuries or monastic libraries, though this did not guarantee their safety. When Muslim and Hindu raiders swept into northeastern India in the 12th century, they destroyed countless Buddhist foundations and burned their contents.

Fleeing monks carried at least some palm-leaf books — portability was a decisive factor here — to monasteries in Tibet and Nepal, where they remained until recent times. Few if any of the Buddhist palm-leaf manuscripts now in museums were actually found in India.

And a book could have a final use. It could be a personal possession; something to keep at home, carry around, examine up close whenever you pleased. That's basically the experience offered by the scattering of palm-leaf pages at the Met, with their elegantly written texts and magnetic little pictures.

In one, Maitreya and his rapt companion play their childlike game. In another, the fiery Tantric goddess Kurukulla, red as a bloody thumbprint, dances a tarantella on the corpse of the god of desire. And in a third, an unnamed bodhisattva — Maitreya again? — distributes fruit to a mob of starving souls.

A bodhisattva is a being who has attained perfect wisdom, then added something to it: love. That's why he's here on the food line rather than off in heaven somewhere. The small figures swarming toward him hungrily reach for the fruit he offers, but they also stare with longing at his dancer's figure and lamp-bright face.

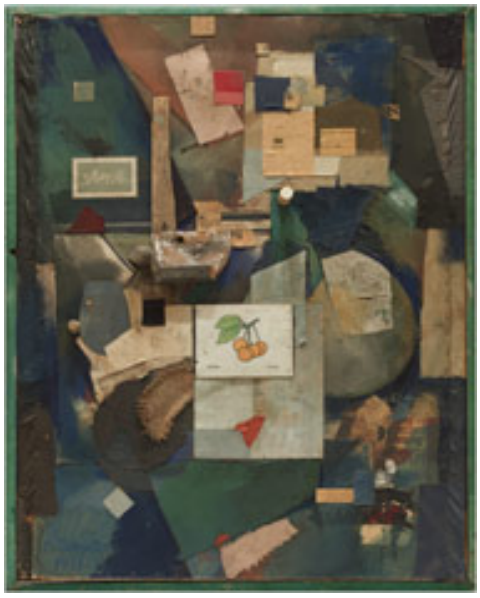
It's as if they couldn't get enough of him, were afraid his generosity might end, afraid he might leave. He doesn't return their gaze, though. He smiles to himself. He knows what they don't know, what the words passed down on palm leaves teach: that wisdom and love are one and the same; that wise love is the love that stays; and that the hand is never empty that gives everything away.

"Early Buddhist Manuscript Painting: The Palm Leaf Tradition" is at the Metropolitan Museum of Art through March 22; (212) 535-7710, metmuseum.org.

http://www.nytimes.com/2008/08/29/arts/design/29budd.html?ref=design

Bits of Paper, Scraps of Cloth and Photographs of Photographs

By KEN JOHNSON



Back in the ’80s, when Sherrie Levine exhibited photographs she made of photographs by Walker Evans, and Richard Prince made photographs of Marlboro cigarette ads leaving out only the text, a new genre was born: Appropriation Art.

Perhaps because of its trendy, anti-authoritarian associations, the term appropriation soon was applied retroactively to any type of art incorporating a foreign, non-traditional element, be it a scrap of newspaper, a button or a stuffed goat. And therein lies the intriguing problem at the heart of “Pipe, Glass, Bottle of Rum: The Art of Appropriation,” a worthy but frustrating exhibition at the Museum of Modern Art.

Organized by Connie Butler, the Modern’s chief curator of drawings, the exhibition features more than 100 works, mostly on paper, from the museum’s permanent collection. Many different ways of using nontraditional images, materials, forms and techniques are represented, from early Cubist collages by Picasso, Braque and Gris that incorporate newsprint and wood-grain paper to the suave, agitprop montages of Barbara Kruger, printed on matchbooks and a shopping bag. Other artists include John Baldessari, Hannah Höch, Sigmar Polke, Richard Hamilton and Mr. Prince.

The problem is that the show has the effect of collapsing many different approaches into one catch-all category. In so doing it confuses almost as much as it illuminates.

Consider, for example, the work from which the show’s title was taken. Picasso’s “Pipe, Glass, Bottle of Rum” (1914), a Cubist still life mostly drawn in charcoal, includes a piece of newspaper with the word “rhum” printed on it. To highlight the incorporation of that newsprint as an act of appropriation may not be wrong, but it obscures the main interest, which is how the newsprint and graphic lettering play within the formal and semiotic economy of the drawing. Printed materials were just part of Cubism’s new expanded palette.

It is also worth remembering that in most 20th-century collage and assemblage the foreign materials artists used were of little or no value. Often they were not owned by anyone before the artist took

possession of them: hence the term "found" as in found object or found photograph. What artists like Kurt Schwitters and Robert Rauschenberg did was more like redemption than appropriation. An old pipe bowl, a card with cherries printed on it, scraps of fabric and wine corks assume a poetic value in Schwitters's "Merz Picture 32 A. The Cherry Picture" (1921) that they never would have had otherwise.

In Rauschenberg's "Quiz" (1958), a drawing made by transferring magazine and newspaper photographs by means of solvent and rubbing, the imagery comes from a kind of vast public visual dump site. It takes on symbolic and metaphorical resonance only in its new high-art context. The artist usually identified as the godfather of appropriation art is Marcel Duchamp. But in designating as art the found objects he called "readymades" — the bottle rack, the snow shovel, the urinal — he studiously avoided laying claim to anything that anyone would regard as intrinsically valuable.

Duchamp is represented here by a small card with a reproduction of Leonardo's "Mona Lisa" and hand-printed below, the letters L.H.O.O.Q., which, read phonetically in French, say, "She has a hot bottom." Made in 1965, it is a reprise of a similar, better-known work from 1920, in which Mona Lisa has been given a goatee and mustache. In the newer piece, "L.H.O.O.Q. Shaved," she has no facial hair.

A label notes that Duchamp appropriated his own earlier work, which was itself an appropriation of Leonardo's painting. But it is truer to say that Duchamp made a witty new variation on his old piece and that if he was appropriating anything, it was not Leonardo's work but a cheap reproduction of it. What he was really doing was making fun of blind reverence for fine art.

With Pop Art the idea of appropriation becomes more relevant. When Roy Lichtenstein copied panels from romance comics, as in a small colored-pencil drawing in this exhibition, he was in a sense stealing someone else's art for his own purposes. But appropriating was not the point for Lichtenstein; it was simply a means, a necessary first step in the transformational process by which he created his own original, high-impact pictures.

Things are fuzzier in a work like Jasper Johns's graphite drawing of an American flag from 1955. If we are to regard this depiction as an act of appropriation, then just about any representation starts to look like an appropriation and the term verges on meaninglessness.

The archetypal appropriation artist of the '80s, Ms. Levine, is represented by a series of 40 small pencil drawings, half of which are copies of works by the German Expressionist Egon Schiele and half copies of works by the Russian Constructivist Kasimir Malevich. Even here the term appropriation seems inexact.

Unlike her photographs of other artist's photographs, these hand-made copies involve no real act of possession or theft: no one would mistake them for the original works or, for that matter, for forgeries. Ms. Levine's action is more like a pantomime of appropriation, a performance designed to raise questions about the cult of male genius on which the allure of modern art is thought to depend.

To study the works in this show on a case by case basis is to realize how many different sorts of acts are entailed: collage, quotation, citation, allusion, theft, redemption; echoing, copying, mimicking, mirroring, tracing, replicating, parodying, plagiarizing, recontextualizing, transforming, deconstructing, plain old representing and maybe a few others, including appropriating. What they all have in common is hard to say, which is why the exhibition leaves you wanting something more — another, revelatory level of curatorial insight.

"Pipe, Glass, Bottle of Rum: The Art of Appropriation" continues through Nov. 10 at the Museum of Modern Art; (212) 708-9400, moma.org.

http://www.nytimes.com/2008/08/29/arts/design/29pipe.html?ref=design

Layers to Comment on Layers of Imagery

By KAREN ROSENBERG

As it sifts through the riches of the extraordinary Gilman Collection of photographs, acquired three years ago, the Met is slowly bringing its holdings of contemporary photography up to speed. In the fall the museum dedicated a new gallery, the Joyce and Robert Menschel Hall, to the exhibition of post-1960 photography.

"Photography on Photography: Reflections on the Medium Since 1960" is the second installation in this space. It is better than the first, largely because of its variety of works (by artists male and female, young and old, American and European, famous and fledgling). Thomas Ruff and Hiroshi Sugimoto are here, but so are Janice Guy, an artist turned dealer who is benefiting from a sudden interest in her early self-portraits, and Mark Wyse, a young photographer who is also active as a curator. The 21-artist mix isn't perfect, but the curator, Doug Eklund, deserves credit for taking a few risks.

The show is also an excellent epilogue to the historical survey "Framing a Century: Master Photographers 1840-1940," just across the hall in the Howard Gilman Gallery. If "Framing a Century" presents a hallowed history of photography, "Photography on Photography" gleefully violates that sanctity.

The exhibition proceeds in roughly chronological order but is weighted toward work from the last decade. A display case of smaller, performance-oriented works from the 1960s is a good place to start. In "Nine Polaroid Photographs of a Mirror" (1967), William Anastasi photographs and rephotographs a mirror as he gradually covers its surface with the prints, producing a grid of pictures within a picture. A photo-booth strip from around the same time shows Vito Acconci contorting his face into animalistic expressions. (The label indicates that he is actually singing Cole Porter's "Anything Goes.")

Ms. Guy's untitled self-portrait from 1979 flirts with the exhibitionism of artists like Mr. Acconci and Robert Mapplethorpe. In the picture she hides her face behind a camera while draping her naked body across a bedsheet.

Another work from the late ’70s, Allen Ruppersberg’s “Miscellaneous Men,” mocks the archival and forensic powers of photography. He constructs a murder mystery around glossy head shots of D-list actors, in the spirit of Warhol’s “Thirteen Most Wanted Men.”

No exhibition titled “Photography on Photography” would be complete without a nod to late-1970s and early-1980s appropriation art. Images from Sherrie Levine’s 1981 series “After Walker Evans,” for which she rephotographed Evans’s portraits of an Alabama sharecropping family, have particular traction at the Met. (At least one of the Evans photographs borrowed by Ms. Levine is hanging in the Gilman.)

In her series “Jackie & Me” (1989), Lutz Bacher reproduces unauthorized shots of Jacqueline Kennedy Onassis by the celebrity photographer Ron Gallela. This cat-and-mouse chase through Central Park would look perfectly respectful next to the work of current-day stalkerazzi, which makes Ms. Bacher’s critique seem less strident.

Bypassing the 1990s the show makes an abrupt transitions to works that convey nostalgia for the veracity, or the technicality, of predigital photography. James Welling’s prismatic photograph of plumbago blossoms looks as though it emerged from a computer screen, but it is the product of an elaborate darkroom process. (It begs comparison to the photograms of William Henry Fox Talbot in “Framing a Century.”)

Roe Ethridge’s “Marina,” a yellow-tinted photograph of a crowded dock, is an original photograph that flaunts its stock-image associations. In Mr. Eklund’s evocative description, the picture looks as if it “had hung for too long on the walls of a seashore bar.”

Across the room Mr. Sugimoto’s startling picture of Fidel Castro — really, a wax likeness of him that resides at Madame Tussauds — is supposed to undermine our faith in the photographic portrait. Yet the museumgoers snapping pictures of the Sugimoto seem undisturbed that it is a copy of a copy.

A few works in “Photography on Photography” aren’t photographs at all. Kota Ezawa makes black-and-white computer drawings of famous photographs, exhibited as a slide show. These crude approximations — of the work of Bernd and Hilla Becher, Man Ray, Weegee and others — lazily summon history without really engaging it.

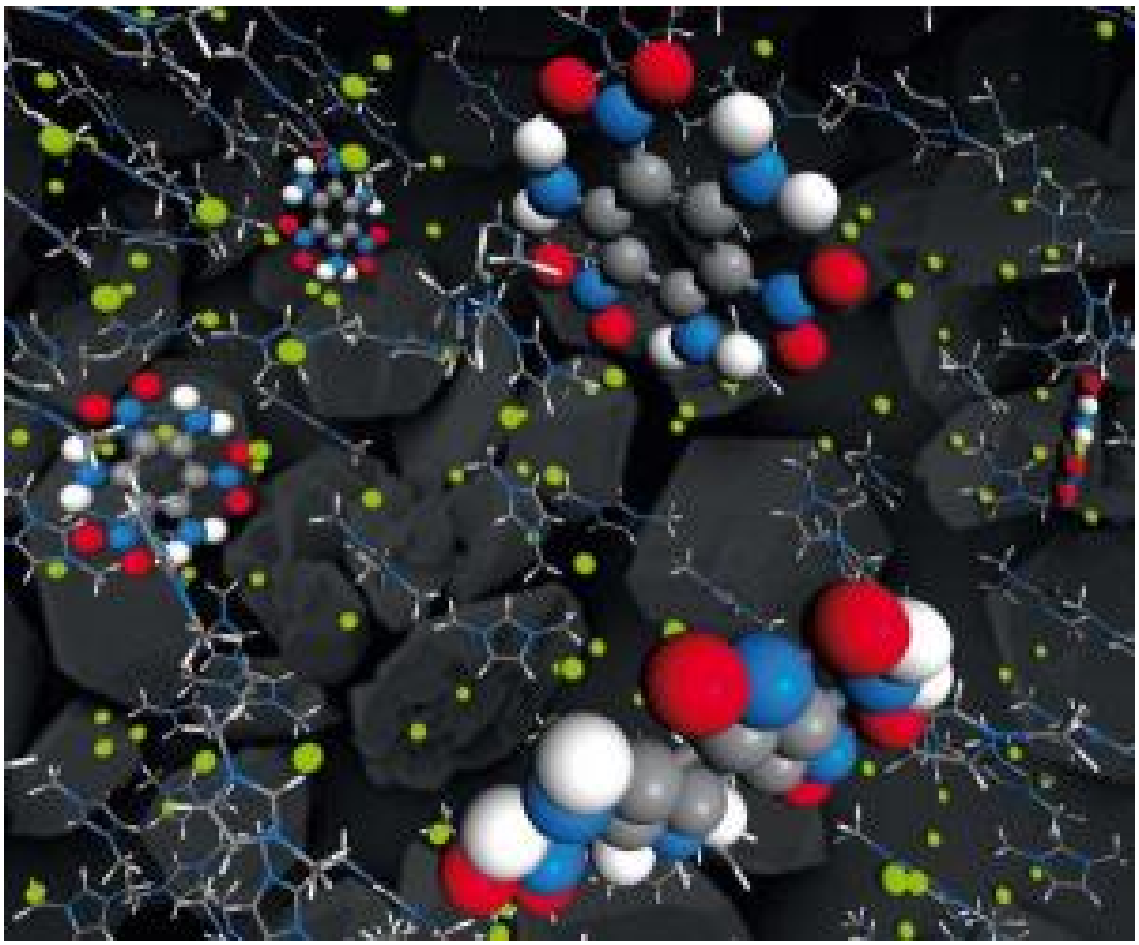
Somewhat more profound are two toy-size figurines by Karin Sander that represent the art dealer Olivier Renaud-Clement and the writer Gordon Tapper. Ms. Sander created these portraits in a two-stage industrial process, taking digital pictures from different angles and then feeding the data into a model-making machine. The photograph becomes an intermediate stage between the real and the virtual, rather than an end in itself.

In “Elizabeth Arden Ceramide Advanced Time Complex Capsules (14 Day Course),” from 2006, the British artist Josephine Pryde makes multiple prints from a single negative showing the anti-wrinkle product named in the title. Elsewhere Ms. Pryde’s series might be taken as a feminist statement. Here it speaks to the aging of a medium. If photographs were once heralded as time capsules, we have come to take their promises with a grain of salt.

“Photography on Photography: Reflections on the Medium Since 1960” continues through Oct. 19 at the Metropolitan Museum of Art; (212) 535-7710, metmuseum.org.

http://www.nytimes.com/2008/08/26/arts/design/26medi.html?ref=design

Explosives Go 'Green' ... And Get More Precise



Fluoride ionic liquid as a novel super-efficient solvent can lead to high-quality single crystals of technologically important materials. The molecules in red, white, blue and gray are the explosive, TATB. The green balls (fluoride anions) and the gray and blue sticks (cations), act as the solvent. The rocks in the background are TATB crystals. (Credit: Image courtesy of DOE/Lawrence Livermore National Laboratory)

ScienceDaily (Aug. 29, 2008) — Certain explosives may soon get a little greener and a little more precise. LLNL researchers added unique green solvents (ionic liquids) to an explosive called TATB (1,3,5-triamino-2,4,6-trinitrobenzene) and improved the crystal quality and chemical purity of the material.

This work, supported under the Transformational Materials Initiative (TMI) Laboratory Research and Development project, appears on the cover of the Sept. 1 issue of the journal Physical Chemistry Chemical Physics.

“Improving crystal quality and purity leads to explosive materials that are safer (less likely to react violently) when subjected to mechanical impact or heat,” said Larry Fried, the project’s principal investigator and a co-author of the paper.

Most explosives belong to a general class of materials called molecular crystals, which have become important building blocks in a number of other applications ranging from drugs, pigments, agrochemicals, dyes and optoelectronics. Many of these materials, including TATB, are bound together by a strong

network of hydrogen-bonds. This extended network often makes these materials nearly insoluble in common organic solvents, leading to poor quality and limited size crystals, which in turn hinders progress in many technological applications.

So the TMI team looked for a suitable alternative, which happened to be ionic liquids – a special type of molten salt that becomes liquid under the boiling point of water (100 degrees Celsius). Chemists recently became interested in ionic liquids because they are solvents with almost no vapor pressure, and do not evaporate, even under high temperature conditions. They also provide researchers an endless number of choices due to the large combinations of positive and negative ions involved.

To narrow the choices down, lead author Amitesh Maiti used state-of-the-art quantum mechanical simulations to identify a special class of ionic liquids containing fluoride anions that are highly effective in dissolving hydrogen-bonded materials such as TATB. (An anion is an atom with a net negative charge, i.e., more electrons than protons.)

"The design of custom solvents through first principles modeling opens up new possibilities for the dissolution of materials that are hard to dissolve," Maiti said.

The next step involved an experimental team, led by Phil Pagoria, who was successful not only in dissolving TATB in such solvents, but also in growing large defect-free crystallites (more than 97 percent pure TATB), which will lead to a better formulated material for explosive applications.

The solvents and the dissolution process developed by the TMI team have applications in other fields as well, such as the production of polymers (plastics) or molecular solids (pharmaceuticals, paints, propellants, explosives). For instance, the team found that fluoride ionic liquids are highly effective in dissolving cellulose (plant fiber), a versatile bio-renewable polymeric material with many applications.

However, the immediate goal is to find a cost-effective way to improve the quality of low purity TATB. TATB is an extremely safe explosive that is used by the Department of Energy, the Department of Defense and the mining industry.

Other Livermore researchers include: Alex Gash, Yong Han, Christine Orme and Richard Gee.

Adapted from materials provided by DOE/Lawrence Livermore National Laboratory.

http://www.sciencedaily.com/releases/2008/08/080828135903.htm

Even Without Dementia, Mental Skills Decline Years Before Death

Older people's mental skills start declining years before death, even if they don't have dementia, a new study finds. (Credit: iStockphoto/Anne De Haas)

ScienceDaily (Aug. 29, 2008) — A new study shows that older people's mental skills start declining years before death, even if they don't have dementia. The study is published in the August 27, 2008, online issue of Neurology®, the medical journal of the American Academy of Neurology.

"These changes are different and separate from the changes in thinking skills that occur as people get older," said study author Valgeir Thorvaldsson, MSc, of Göteberg University in Sweden. "We found accelerated changes in people's mental skills that indicated a terminal decline phase years before death."

The start of the decline is different for various cognitive abilities. Perceptual speed, which measures how quickly people can compare figures, begins declining nearly 15 years before death. Spatial ability starts declining nearly eight years before death. And verbal ability starts declining about six-and-a-half years before death.

The study involved 288 people with no dementia who were followed from age 70 to death, with an average age at death of 84. The participants' mental skills were measured up to 12 times over a period of 30 years, and they were evaluated to make sure they had not developed dementia.

A number of factors may explain this terminal decline in mental skills, Thorvaldsson said. "Cardiovascular conditions such as heart disease or dementia that is too early to be detected could be factors," he said. "Increased health problems and frailty in old age often lead to inactivity, and this lack of exercise and mental stimulation could accelerate mental decline."

Thorvaldsson noted that verbal abilities declined sharply in the terminal phase and did not decline significantly due to age only. "This indicates that people remain stable in their verbal abilities unless they are experiencing disease processes that also increase their mortality risk," he said. "A change in verbal ability might therefore be considered a critical marker for degeneration in health in older people."

The study was supported by the Swedish Brain Power and the Swedish Council for Working Life and Social Research.

Adapted from materials provided by American Academy of Neurology.

http://www.sciencedaily.com/releases/2008/08/080827163806.htm

Researchers Provide Solution To World's Worst Mass Poisoning Case

Arsenic treatment system. (Credit: Image courtesy of Queen's University, Belfast)

ScienceDaily (Aug. 29, 2008) — A solution to the world's worst case of ongoing mass poisoning, linked to rising cancer rates in Southern Asia, has been developed by researchers from Queen's University Belfast.

It is estimated that over 70 million people in Eastern India and Bangladesh, experience involuntary arsenic exposure from consuming water and rice; the main staple food in the region. This includes farmers who have to use contaminated groundwater from minor irrigation schemes.

It is estimated that for every random sample of 100 people in the Bengal Delta, at least one person will be near death as a result of arsenic poisoning, while five in 100 will be experiencing other symptoms.

Now, researchers have created new low-cost technology to provide arsenic-free water to millions of people in South Asia currently exposed to high levels of the poison in groundwater.

Leading an international team, Queen's researchers have developed a trial plant in Kasimpore, near Calcutta, which offers chemical-free groundwater treatment technology to rural communities for all their drinking and farming needs.

The technology is based on recharging a part of the groundwater, after aeration, into a subterranean aquifer (permeable rock) able to hold water. Increased levels of oxygen in the groundwater slow down the arsenic release from the soil. At higher dissolved oxygen levels, soil micro organisms, as well as iron and manganese, reduce the dissolved arsenic level significantly.

Dr Bhaskar Sen Gupta of Queen's, co-ordinator of the project said: "Arsenic poisoning is behind many instances of ill-health in Southern Asia, including a rising number of cancer cases. Developing a low cost method of decontaminating ground water that is laced with high levels of arsenic is a key challenge for sustainable agriculture there.

"While there are some techniques available for treating relatively small quantities of water, there has, until now, been no viable technology available for decontaminating groundwater on a large scale that can ensure safe irrigation and potable water supply.

"This project developed by Queen's is the only method which is eco-friendly, easy to use and deliverable to the rural community user at an affordable cost."

The project is part of the EU-funded Asia Pro Eco Programme which is dedicated to the improvement of environmental performance in Asian economic sectors. Known as TiPOT (Technology for in-situ treatment of groundwater for potable and irrigation purposes), a key part of the project is the establishment of sustainable technology partnerships.

Explaining further, Dr Sen Gupta said: "From its inception we have had the vital support of Indian-based stakeholders, such as village councils and local financial institutions. This has been vital as they are the authorities who monitor the water supply and distribution in rural areas and provide micro-credit to the local farmers.

"With their help, we now have a solution which is transferable to many areas in need across Asia."

The new plant will be maintained and operated by local village technicians. To help apply the technology to other areas in the South Asian region, the World Bank has given a grant of $200,000 to the TIPOT consortium to set up six more subterranean water treatment plants in the Gangetic plains of West Bengal.

Further information on the project can be found at http://www.qub.ac.uk/sites/TiPOT/

Adapted from materials provided by Queen's University, Belfast.

http://www.sciencedaily.com/releases/2008/08/080828084322.htm

Arctic Ice On Verge Of Another All-time Low

Envisat ASAR mosaic from mid-August 2008 showing an almost ice-free Northwest Passage. The direct route through the Northwest Passage is highlighted in the picture by an orange line. The orange dotted line shows the indirect route, called the Amundsen Northwest Passage, which has been passable for almost a month. (Credit: Image courtesy of European Space Agency)

ScienceDaily (Aug. 28, 2008) — Following last summer's record minimum ice cover in the Arctic, current observations from ESA's Envisat satellite suggest that the extent of polar sea-ice may again shrink to a level very close to that of last year.

Envisat observations from mid-August depict that a new record of low sea-ice coverage could be reached in a matter of weeks. The animation above is a series of mosaics of the Arctic Ocean created from images acquired between early June and mid-August 2008 from the Advanced Synthetic Aperture Radar (ASAR) instrument aboard Envisat. The dark grey colour represents ice-free areas while blue represents areas covered with sea ice.

Current ice coverage in the Arctic has already reached the second absolute minimum since observations from space began 30 years ago. Because the extent of ice cover is usually at its lowest about mid-September, this year's minimum could still fall to set another record low.

Each year, the Arctic Ocean experiences the formation and then melting of vast amounts of ice that floats on the sea surface. An area of ice the size of Europe melts away every summer reaching a minimum in September. Since satellites began surveying the Arctic in 1978, there has been a regular decrease in the area covered by ice in summer – with ice cover shrinking to its lowest level on record and opening up the most direct route through the Northwest Passage in September 2007.

The direct route through the Northwest Passage - highlighted in the image above by an orange line - is currently almost free of ice, while the indirect route, called the Amundsen Northwest Passage, has been passable for almost a month. This is the second year in a row that the most direct route through the Northwest Passage has opened up.

Prof. Heinrich Miller from the Alfred Wegener Institute (AWI) in Bremerhaven, Germany commented that, "Our ice-breaking research vessel 'Polarstern' is currently on a scientific mission in the Arctic Ocean. Departing from Iceland, the route has taken the ship through the Northwest Passage into the Canadian Basin where geophysical and geological studies will be carried out along profiles into the Makarov Basin to study the tectonic history and submarine geology of the central Arctic Ocean. In addition, oceanographic as well as biological studies will be carried out. Polarstern will circumnavigate the whole Arctic Ocean and exit through the Northeast Passage."

Regarding the use of satellite data for polar research Miller continues, "The polar regions, especially the Arctic, are very sensitive indicators of climate change. The UN's Intergovernmental Panel on Climate Change has shown that these regions are highly vulnerable to rising temperatures and predicted that the Arctic would be virtually ice-free in the summer months by 2070. Other scientists claim it could become ice-free as early as 2040. Latest satellite observations suggest that the Arctic could be mainly ice-free even earlier."

Miller added, "At AWI we place particular emphasis on studying Arctic sea-ice, and along with in-situ studies of sea-ice thickness change satellite data have been used extensively - not only for the regular observation of changes in the Arctic and Antarctic, but also for optimising the operation of Polarstern in regions covered by sea ice."

The Arctic is one of the most inaccessible regions on Earth, so obtaining measurements of sea ice was difficult before the advent of satellites. For more than 20 years, ESA has been providing satellite data for the study of the cryosphere and hence revolutionising our understanding of the polar regions.

Satellite measurements from radar instruments can acquire images through clouds and also at night. This capability is especially important in areas prone to long periods of bad weather and extended darkness – conditions frequently encountered in the polar regions.

By making available a comprehensive dataset from its Earth Observation satellites and other ground and air-based capabilities, ESA is currently also contributing to one of the most ambitious coordinated science programme ever undertaken in the Arctic and Antarctic - the International Polar Year 2007-2008.

Further exploitation of data collected over the Arctic since 1991 is part of an ESA Initiative on Climate Change that will be proposed to the ESA Member States at its Ministerial Conference in November 2008. The proposal aims to ensure delivery of appropriate information on climate variables derived from satellites.

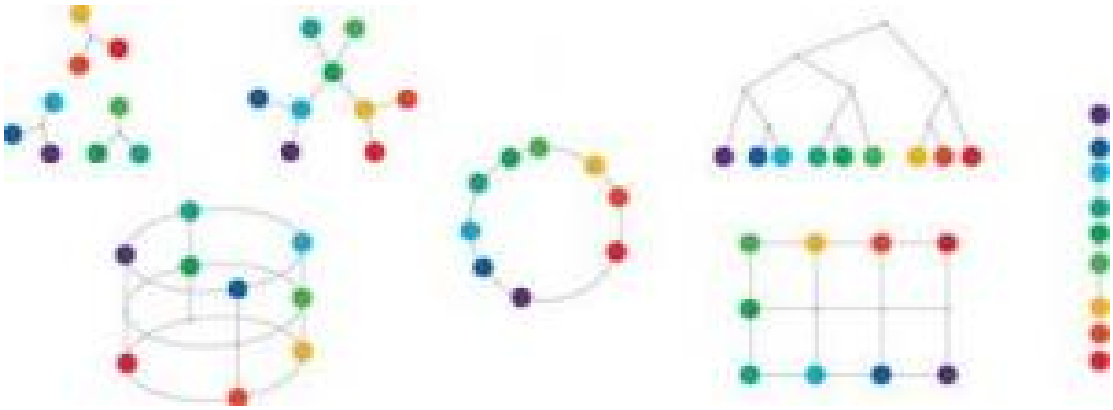
In 2009, ESA will make another significant contribution research into the cryosphere with the launch of CryoSat-2. The observations made over the three-year lifetime of the mission will provide conclusive evidence on the rates at which ice thickness and cover is diminishing.

Adapted from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2008/08/080828120314.htm

Model Helps Computers Sort Data More Like Humans

MIT associate professor Josh Tenenbaum and his former student, Charles Kemp, have developed a computer algorithm that can select the best type of structure to fit a set of data. Such structures, shown here, include linear order, rings and clusters. (Credit: Image courtesy of Charles Kemp)



ScienceDaily (Aug. 28, 2008) — Humans have a natural tendency to find order in sets of information, a skill that has proven difficult to replicate in computers. Faced with a large set of data, computers don't know where to begin -- unless they're programmed to look for a specific structure, such as a hierarchy, linear order, or a set of clusters.

Now, in an advance that may impact the field of artificial intelligence, a new model developed at MIT can help computers recognize patterns the same way that humans do. The model, reported earlier this month in the Proceedings of the National Academy of Science, can analyze a set of data and figure out which type of organizational structure best fits it.

"Instead of looking for a particular kind of structure, we came up with a broader algorithm that is able to look for all of these structures and weigh them against each other," said Josh Tenenbaum, an associate professor of brain and cognitive sciences at MIT and senior author of the paper.

The model could help scientists in many fields analyze large amounts of data, and could also shed light on how the human brain discovers patterns.

The computer algorithm was developed by recent MIT PhD recipient Charles Kemp, now an assistant professor of psychology at Carnegie Mellon University, along with Tenenbaum.

The model considers a range of possible data structures, such as trees, linear orders, rings, dominance hierarchies, clusters, etc. It finds the best-fitting structure of each type for a given data set and then picks the type of structure that best represents the data.

Humans perform the same feat in everyday life, often unconsciously. Several scientific milestones have resulted from the human skill of finding patterns in data -- for example, the development of the periodic table of the chemical elements or the organization of biological species into a tree-structured system of classification.

Children exhibit this data organization skill at a young age, when they learn that social networks can be organized into cliques, and that words can fit into overlapping categories (for example, dog, mammal, animal).

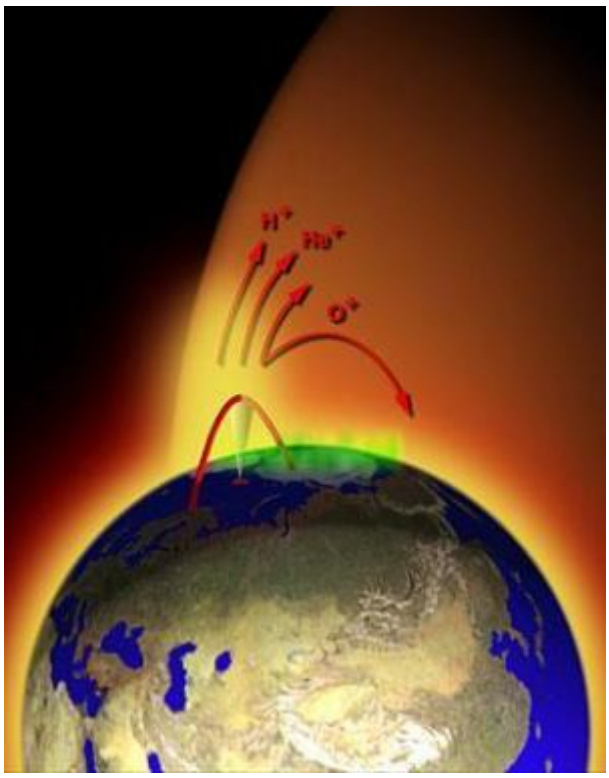
"We think of children as taking in data, forming theories, and testing those theories with experiments. They're like little scientists," Tenenbaum said. "Until now there's been no good computational model for how children can, like scientists, grasp the underlying global structure of a set of data."

The research was funded by the James S. McDonnell Foundation Causal Learning Research Collaborative, the Air Force Office of Scientific Research, and the NTT Communication Sciences Laboratory.

Adapted from materials provided by Massachusetts Institute Of Technology. Original article written by Anne Trafton.

http://www.sciencedaily.com/releases/2008/08/080828121652.htm

Cluster Watches Earth's Leaky Atmosphere



This artist's impression shows electrically charged oxygen, hydrogen and helium atoms (ions) leaking into space from the Earth atmosphere, over the poles. ESA's Cluster mission discovered that this accelerated escape is driven by changes in direction of the Earth own magnetic field. (Credit: NASA/ESA)

ScienceDaily (Aug. 28, 2008) — Oxygen is constantly leaking out of Earth's atmosphere and into space. Now, ESA's formation-flying quartet of satellites, Cluster, has discovered the physical mechanism that is driving the escape. It turns out that the Earth's own magnetic field is accelerating the oxygen away.

The new work uses data collected by Cluster from 2001 to 2003. During this time, Cluster amassed information about beams of electrically charged oxygen atoms, known as ions, flowing outwards from the polar regions into space. Cluster also measured the strength and direction of the Earth's magnetic field whenever the beams were present.

Hans Nilsson, Swedish Institute of Space Physics, headed a team of space scientists who analysed the data. They discovered that the oxygen ions were being accelerated by changes in the direction of the magnetic field. "It is a bit like a sling-shot effect," says Nilsson.

Having all four Cluster spacecraft was essential to the analysis because it gave astronomers a way to measure the strength and direction of the magnetic field over a wide area. "Cluster allowed us to measure the gradient of the magnetic field and see how it was changing direction with time," says Nilsson.

Before the space age, scientists believed that Earth's magnetic field was filled only with particles from the solar wind, the constant sleet of particles that escapes from the Sun. They thought this formed a large cushion that protected the Earth's atmosphere from direct interaction with the solar wind.

"We are beginning to realise just how many interactions can take place between the solar wind and the atmosphere," says Nilsson. Energetic particles from the solar wind can be channelled along the magnetic field lines and, when these impact the atmosphere of the Earth, they can produce aurorae. This occurs over the poles of Earth. The same interactions provide the oxygen ions with enough energy to accelerate out of the atmosphere and reach the Earth's magnetic environment.

The Cluster data were captured over the poles with the satellites flying at an altitude of anywhere between 30,000 and 64,000 kilometres. Measurements taken by earlier satellites during the 1980s and 1990s showed that the escaping ions were travelling faster the higher they were observed. This implied that some sort of acceleration mechanism was involved and several possibilities were proposed. Thanks to this new Cluster study, the mechanism accounting for most of the acceleration has now been identified.

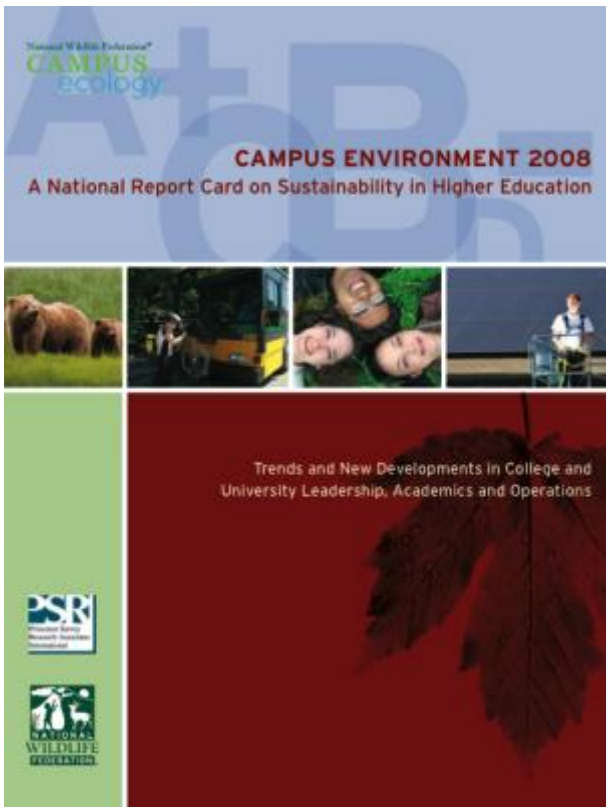
At present, the escape of oxygen is nothing to worry about. Compared to the Earth's stock of the life-supporting gas, the amount escaping is negligible. However, in the far future when the Sun begins to heat up in old age, the balance might change and the oxygen escape may become significant. "We can only predict these future changes if we understand the mechanisms involved," says Nilsson.

For now, Cluster will continue collecting data and providing new insights into the complex magnetic environment surrounding our planet.

Adapted from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2008/08/080828090715.htm

New Report Card Shows Campuses Going Greener



Campus Report Card: Are the grades green enough? (Credit: Image courtesy of)

ScienceDaily (Aug. 28, 2008) — Is your alma mater among those stepping up to green their campuses? Are our colleges preparing students for a greener future? You can find out in National Wildlife Federation's just-released Campus Environment 2008 Report Card, a comprehensive look at nationwide trends in sustainability among America's institutions of higher learning. The report compares findings with the previous study conducted in 2001.

The 2008 Report Card, based on a survey conducted in partnership with Princeton Survey Research Associates International, found that environmentally progressive and sustainable operations are now ranked among the highest priorities on campus. Ironically however, students are less likely to be environmentally literate when they graduate than their predecessors.

The study, which reviews programs at 1,068 institutions, recognizes colleges and universities for exemplary performance and awards academic letter grades (A through D) for collective, national performance on a broad range of conservation issues, including energy, water, transportation, landscaping, waste reduction and environmental literacy. Campuses in the survey are not graded or ranked on an individual basis; rather, the survey analyzes collective trends in the areas of management, operations, and academics.

With 27% of U.S. colleges and universities responding, the 2008 survey (sent to presidents, administrators, and facilities managers) is the nation's largest study to date created to gauge trends and new developments in campus sustainability. It was also the first study of its kind when conducted in 2001.

"The 2008 report finds that campus leaders value sustainability. They speak about it, plan for it, hire staff to support it, and the campuses they lead are steadily becoming greener models for the wider society," said Julian Keniry, NWF's senior director of campus and community leadership. "At the same time, the educational curricula to prepare students for a post-college world influenced by climate change are not keeping pace. On most campuses, the business leaders and facilities managers appear to be making greater strides towards sustainability than their faculty peers."

The study reveals trends including:

- The most prevalent environmental initiative is water conservation, versus recycling in 2001;
- Conserving energy is 2008's most popular performance goal, versus the 2001 goal of upping environmental performance in new buildings;
- The biggest green opportunity colleges are missing is adequate education about sustainability for their students;
- Funding is the biggest obstacle to expanding environmental and sustainability programming, versus the "other priorities" cited in 2001.

Regarding school management, American colleges show greener overall leadership than they did in 2001. The study reveals that management generally values environmental, social and economic sustainability and is putting systems in place to broaden and sustain engagement campus-wide. Indicators of this commitment include increased goal-setting to improve performance, more staffing for sustainability programs, and a rise in orientation programs on waste reduction and other sustainability efforts on campus.

However, sustainability initiatives still face roadblocks such as inadequate funding and support for faculty development.

Efforts to green our campuses shine most brightly in day-to-day operations. Facilities leaders, together with students and faculty, have been instrumental in driving programs to conserve energy and water, increase the amount of clean energy used to power the campus, and reduce waste. Since 2001, the number of campuses using clean renewable energy has grown significantly, and a new movement to reduce emissions of carbon dioxide and other greenhouse gases has taken hold. However, little progress has been made to date in reducing the congestion, pollution and other environmental impacts associated with campus commuting.

Results show that academics still lag behind the operations vision of the campus—even more so than when this survey was first conducted in 2001. Sustainability-related education offerings and recruitment programs have declined, as have faculty doing environmental and sustainability research. Just over half of colleges and universities now offer either an undergraduate major or minor in environmental and sustainability studies, down from two-thirds in 2001.

"This Report Card tells us there is a widening gap between where higher education actually is on teaching sustainability versus where it should be," said Kevin Coyle, vice president of education for National Wildlife Federation. "Given the environmental challenges and opportunities this generation will face, I find this cause for deep concern and am committed to working with our partners to address this on both state and federal levels."

More than 240 individual schools are recognized and named in the report for having exemplary levels of sustainability activities, as determined by survey responses. The school engaged in the greatest number of such activities is Willamette University in Salem, Oregon. Willamette is committed to energy efficiency and conservation, greener transportation, environmentally friendly landscaping practices, as well as to orienting personnel and faculty to the sustainability goals of the campus.

Other campuses with high numbers of exemplary marks include the Georgia Institute of Technology, Atlanta; Michigan State University, East Lansing; University of Arizona, Tucson; University of North Carolina at Chapel Hill, and Cascadia Community College in Bothell, Washington. Dozens of other campuses are recognized in the report for specific programs.

The 2008 Report Card data, highlighting current trends and comparing them with 2001, provides ideas for enhancing sustainability at any school or business. It is designed to inspire further effort to improve environmental performance and literacy at all schools. Moreover, the results will help to shape state and national education policy initiatives.

"The NWF Report Card is the Gold Standard for charting the sustainability movement in higher education. Coverage of both operational and academic programs is particularly important. Strongly recommended reading for administrators, faculty and students," said David W. Orr, professor of Environmental Studies and senior advisor to the president, Oberlin College. He is also the author of Earth in Mind, Ecological Literacy, The Last Refuge, and Design on the Edge.

More than 18 million students are enrolled in over 4,000 American colleges and universities, offering a compelling opportunity for sustainability leadership. "The Campus Environment 2008 Report Card reveals just how well institutions of higher learning are preparing students for the environmental challenges they will face in the 21st century," said Mary McIntosh, PhD, lead survey researcher with Princeton Survey Research Associates International. "Many of the men and women who will lead our businesses, educational institutions and government agencies in the next 20 years are in college now."

"We need to offer today's college students the kind of academic and professional preparation that will ready them to envision and create a healthier and more sustainable world," concludes David Eagan, PhD, survey project co-coordinator based at the University of Wisconsin-Madison.

Co-sponsors of the study include the American Association of Community Colleges (AACC), American Association of Sustainability in Higher Education (AASHE), APPA-Leadership in Educational Facilities, American Society of Landscape Architects (ASLA), Clean Air-Cool Planet (CA-CP), Energy Action Coalition, National Association for Educational Procurement (NAEP), National Association of State Universities and Land-Grant Colleges (NASULGC), National Association of College and University Business Officers (NACUBO), National Association of Campus Activities (NACA), the Nelson Institute for Environmental Studies at UW-Madison, Society for College and University Planning (SCUP).

The study is funded by the Kendeda Fund and other sources.

The full Campus Report Card, including a list of schools participating in the survey and a list of schools with exemplary programs can be found at http://www.campusecology.org.

Adapted from materials provided by National Wildlife Federation.

http://www.sciencedaily.com/releases/2008/08/080827204904.htm

Subliminal Learning Demonstrated In Human Brain

New research uses sophisticated perceptual masking, computational modeling, and neuroimaging to show that instrumental learning can occur in the human brain without conscious processing of contextual cues. (Credit: iStockphoto/Kiyoshi Takahase Segundo)

ScienceDaily (Aug. 28, 2008) — Although the idea that instrumental learning can occur subconsciously has been around for nearly a century, it had not been unequivocally demonstrated. Now, a new study published by Cell Press in the August 28 issue of the journal Neuron used sophisticated perceptual masking, computational modeling, and neuroimaging to show that instrumental learning can occur in the human brain without conscious processing of contextual cues.

"Humans frequently invoke an argument that their intuition can result in a better decision than conscious reasoning," says lead author Dr. Mathias Pessiglione from the Wellcome Trust Centre for Neuroimaging at the University College London. "Such assertions may rely on subconscious associative learning between subliminal signals present in a given situation and choice outcomes." For instance, a seasoned poker player may play more successfully because of a learned association between monetary outcomes and subliminal behavioral manifestations of their opponents.

To investigate this phenomenon, Dr. Pessiglione and colleagues created visual cues from scrambled, novel, abstract symbols. Visual awareness was assessed by displaying two of the masked cues and asking subjects if they perceived any difference. "We reasoned that if subjects were unable to correctly perceive any difference between the masked cues, then they were also unable to build conscious representations of cue-outcome associations," explains Dr. Pessiglione.

In the next set of experiments, subjects performed a subliminal conditioning task that employed the same masking procedure, but the cues were now paired with monetary outcomes. Using this methodology, the

researchers observed that pairing rewards and punishments guided behavioral responses and even conditioned preferences for abstract cues that subjects could not consciously see.

The researchers collected scans of the brain, using functional magnetic resonance imaging, to investigate the specific brain circuitry that is linked to subliminal instrumental conditioning. "The ventral striatum responded to subliminal cues and to visible outcomes in a manner that closely approximates our computational algorithm, expressing reward expected values and prediction errors," says Dr. Pessiglione. "We conclude that, even without conscious processing of contextual cues, our brain can learn their reward value and use them to provide a bias on decision making."

The researchers include Mathias Pessiglione, University College London, London, UK, INSERM U610, Universite´ Pierre et Marie Curie, Paris, France; Predrag Petrovic, University College London, London, UK Jean Daunizeau, University College London, London, UK; Stefano Palminteri, INSERM U610, Universite´ Pierre et Marie Curie, Paris, France; Raymond J. Dolan, University College London, London, UKand Chris D. Frith, University College London, London, UK.

Journal reference:

1. Mathias Pessiglione, Predrag Petrovic, Jean Daunizeau, Stefano Palminteri, Raymond J. Dolan, and Chris D. Frith. **Subliminal Instrumental Conditioning Demonstrated in the Human Brain**. *Neuron*, 2008; 59: 561-567 [link]

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

http://www.sciencedaily.com/releases/2008/08/080827163810.htm

Olive Leaf Extract Can Help Tackle High Blood Pressure And Cholesterol

A specific olive leaf extract can lower cholesterol and lower blood pressure in patients with mild hypertension (high blood pressure), a new study has found. (Credit: iStockphoto)

ScienceDaily (Aug. 28, 2008) — Taking 1000mg of a specific olive leaf extract (EFLA®943) can lower cholesterol and lower blood pressure in patients with mild hypertension (high blood pressure). These findings came from a 'Twins' trial, in which different treatments were given to identical twins.

By doing this, researchers could increase the power of their data by eliminating some of the uncertainties caused by genetic variations between individual people.Hypertension is one of the most common and important disease risk factors imposed by the modern lifestyle. Many people would therefore benefit from finding ways of reducing blood pressure. Experiments in rats had previously indicated that olive leaf extract could be one way of achieving this goal.To test this in humans, researchers from Switzerland and Germany conducted a pilot trial with 20 identical (monozygotic) twin pairs who had an increased blood pressure. Individuals were either given placebo capsules or capsules containing doses of 500mg or 1000mg of olive leaf extract EFLA®943. Pairs of twins were assigned to different treatments. After the subjects had taken the extract for eight weeks researchers measured blood pressures as well as collecting data about aspects of life-style.

"The study confirmed that olive leaf extract EFLA®943 has antihypertensive properties in humans," says one of the co-authors, Cem Aydogan, General Manager, Frutarom Health."This works showed that taking a 1000mg dose has substantial effects in people with borderline hypertension," says Aydogan.The research is published in the latest edition of Phytotherapy Research.

Adapted from materials provided by Wiley-Blackwell, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080827002717.htm

Wind-powered 'Ventomobile' Places First in Race

The Ventomobile, constructed by Stuttgart University's InVentus student team, placed first at the recent Aeolus Race. (Credit: Tobias Klaus)

ScienceDaily (Aug. 28, 2008) — The solely wind-driven Ventomobile constructed by the InVentus team, a team of some 20 Stuttgart University students of Aerospace Engineering, came in first at the "Aeolus Race" in the Dutch town of Den Helder last Friday.

Racing the extremely stylish and lightweight three-wheeler, the vehicles of five European universities and research centres had difficulties to catch up. For their "innovative design" and public relations work, the InVentus team were also awarded prizes. The ECN-impulse built by the Energy research Centre of the Netherlands (ECN) came in second. The Flensburg University of Applied Sciences won the third prize with their very solid but slow Headwind Tricycle.

In this first time ever race the participating teams were challenged to drive directly into the wind, without tacking. During the preliminary races, the Stuttgart Ventomobile had already proven to be the most lightweight and most efficient vehicle among the contestants when, with its 130 kg, it succeeded in racing at 64% of the wind speed directly against the wind. From then on it was considered a serious contender for the win.

"Winning this prize was a great reward for our intense construction work during the last few months," said a thrilled Alexander Miller. Working with some 20 students, he and Jan Lehmann developed and constructed the vehicle from the summer of 2007 onwards with the support of the Endowed Chair of Wind Energy at the University of Stuttgart.

The students constructed the drive shaft and the rotor blades of the three-wheeler utilising the know-how at the Stuttgart University Department of Composites and Lightweight Construction. The experience of the students and the staff at the Institute of Aero- and Gasdynamics also helped greatly in optimizing the vehicle. The carbon-fibre-built tower can be turned into the wind, and through pitching the blades can be adjusted optimally to the wind speed. Via two bicycle gearboxes and a bicycle chain the power then is transmitted to the axle.

Matthias Schubert, Chief Technical Officer of the main sponsor REpower Systems AG, applauds the integration of this project into the coursework of the students: "The achievement of managing a big team over many months, and even making select construction tasks part of undergraduate teaching cannot be estimated highly enough! The enthusiasm the students show in renewable energies and the development of innovative solutions should serve the industry as an example for the development of new technologies."

Prof. Martin Kühn, head of the Endowed Chair of Wind Energy and mentor of the InVentus team, is pleased about the success of his students. "The expert knowledge the students acquired during this project constitute an unique experience which will prove extremely helpful in their future careers. The Ventomobile and its competitors represent excellent and creative examples of intelligent uses of wind energy," he points out, at the same time promoting a better use of renewable energies.

Adapted from materials provided by University of Stuttgart, via AlphaGalileo

http://www.sciencedaily.com/releases/2008/08/080827104702.htm

New LIDAR System Sees The Sky In 3D

Part of the new LIDAR system installed in Western Switzerland's weather forecasting headquarters. (Credit: Image courtesy of Ecole Polytechnique Federale de Lausanne (EPFL))

ScienceDaily (Aug. 28, 2008) — EPFL, the Swiss National Science Foundation and Switzerland's National Weather service, MeteoSwiss, are inaugurating a new LIDAR measurement system in Payerne, Switzerland. This technically innovative installation, unique in the world, will provide continuous data on atmospheric humidity for Western Switzerland's weather forecasting headquarters.

To make accurate forecasts, meteorologists need data on the vertical distribution of temperature and humidity in the atmosphere. The LIDAR system developed by EPFL can collect these data continuously and automatically up to an altitude of 10km. On August 26, EPFL will officially transfer this custom-developed LIDAR to MeteoSwiss, and from this point on Swiss forecasters will have access to this source of vertical humidity data for the models they use to calculate weather predictions. The project was supported by funding from the Swiss National Science Foundation.

One-of-a-kind Swiss know-how

The LIDAR system developed by EPFL is a relative of the familiar RADAR systems used widely in weather forecasting. Instead of sending radio waves out looking for water droplets, however, the LIDAR sends a beam of light vertically into the sky. The "echo" here is a reflection of that light from different layers in the atmosphere. This reflection is used to build an instantaneous vertical profile of temperature and humidity. The spatial and temporal resolution is excellent – the laser beam can be shot 30 times per second, a vast improvement over weather balloons that take minutes to reach the upper atmosphere and can be sent out only a few times a day.

And even though it's state-of-the-art technology, the LIDAR developed by EPFL is stable and reliable; even after a test run of several months, it did not need tuning. Traditional LIDAR systems are more finicky, typically needing to be tuned on a daily basis. According to project leader and EPFL Professor Hubert van den Bergh, "This LIDAR will serve as a reference for future or existing systems, especially since this kind of remote sensing is experiencing rapid development."

An ideal complement to MeteoSwiss' forecasting toolkit

The new LIDAR will operate at the Center for Technical Measurements at MeteoSwiss' Payerne weather service. It will provide an ideal complement to the traditional instrumentation already in place: a ground-based measurement network, balloon launched radio-soundings, radar equipment, remotely sensed windspeed and temperature measurements, and a station of the Baseline Surface Radiation Network, part of a world-wide network that measures radiation changes at the Earth's surface.

The combination of all these measurements will open up new possibilities, and weather forecasting models stand to benefit. The acquisition of the LIDAR will bring high-resolution three-dimensional humidity data to Swiss weather forecasting for the first time.

Adapted from materials provided by Ecole Polytechnique Federale de Lausanne (EPFL).

http://www.sciencedaily.com/releases/2008/08/080826080759.htm

More Aortic Chest Aneurysms Being Treated With Less-invasive Stents

ScienceDaily (Aug. 28, 2008) — An estimated 60,000 Americans are walking around with time bombs in their chests called thoracic aortic aneurysms.

At any time, their main chest artery could suddenly burst open, causing massive internal bleeding that is almost always fatal.

It's possible to repair the defect before the artery bursts, but traditional surgery is highly invasive. The operation typically requires an 18-inch incision, a week or two in the hospital and three to six months to recover. There are several major risks, including stroke and paralysis.

At Loyola University Hospital, an increasing number of patients are being treated with a device called a stent graft, which is inserted without opening the chest. Stent graft patients typically go home in a day or two, and recover fully in about two weeks.

At Loyola's Thoracic Aortic Disease Clinic, about 70 percent of patients who undergo surgery for aneurysms in the chest artery are receiving stent grafts rather than open chest surgery. "And as the technology evolves, we will be doing more and more stenting," said Dr. Jeffrey Schwartz, associate professor in the Department of Thoracic and Cardiovascular Surgery at Loyola University Chicago Stritch School of Medicine.

The stent graft used in chest arteries is a polyester tube covered by metal webbing. It is delivered with a catheter (thin tube). The surgeon inserts the catheter in a groin artery, and guides it to the thoracic aorta (chest artery). Once the stent graft is deployed from the catheter, the device expands outward to the walls of the artery. Depending on the patient, the stent graft is roughly 1 inch to 2 inches wide and 4 to 8 inches long, said Dr. Michael Tuchek, who has conducted several clinical trials of aortic stent grafts. Tuchek is a clinical assistant professor in the Department of Thoracic and Cardiovascular Surgery at Stritch.

James Feehan of Bolingbrook, Ill. recently received a stent graft to repair a life-threatening aneurysm in his chest aorta. The aorta is the main artery from the heart. An aneurysm occurs when the walls of the aorta thin and balloon outward. As the bulge grows, there's an increasing risk the aorta could suddenly burst. Feehan had undergone four earlier open-chest surgeries to repair other defects in his aorta. By comparison, the stent graft procedure was "a walk in the park," he said.

Feehan, 78, probably could not have survived another open chest surgery, said Tuchek, who placed the stent graft. Now, thanks to the stent graft, "he can go home and see his grandkids," Tuchek said.

The first-generation thoracic aortic stent grafts were approved in 2005. Feehan recently became one of the first patients in the country to receive the latest-generation stent graft, called Talent. The new device will make it possible for significantly more patients to have stent graft repairs rather than open surgery, Tuchek said.

The difference between the older stent grafts and the new one "is kind of like the difference between a Model T and a Ferrari," Tuchek said.

In a study published recently in the Journal of Vascular Surgery, researchers compared 195 patients who received the new stent graft with 189 patients who underwent traditional open chest surgery. About 84 percent of the open chest surgery patients experienced major complications, compared with only 41 percent in the stent graft group. After 12 months, 11.6 percent of the open chest surgery patients had died of aneurysm-related causes, compared with 3.1 percent in the stent graft group. Tuchek is a co-author of the study, which was funded by the manufacturer of the stent graft.

Loyola's thoracic aortic disease clinic follows more than 1,000 patients. About 80 percent of the patients have aortic aneurysms. Other conditions treated at the clinic include aortic dissection (the inner layer of the aorta's artery wall splits open) and ulcerated plaques (irregular buildup of cholesterol and other deposits in the aortic walls).

Risk factors for aneurysms and other aortic defects include smoking, hardening of the arteries, diabetes, family history, high blood pressure and congenital disorders such as Marfan syndrome. Many people do not realize they have aneurysms until the bulges are detected on CT scans or MRIs.

Because aortic disease is relatively uncommon, many surgeons and cardiologists refer patients to specialty centers such as Loyola. Loyola's aortic clinic treats patients from Illinois, Indiana, Wisconsin, Michigan and Iowa. Patients have come from as far away as Florida and Arizona.

The clinic is a collaborative effort. Schwartz, for example, specializes in open chest surgery, while Tuchek has helped pioneer the use of thoracic aortic stent grafts.

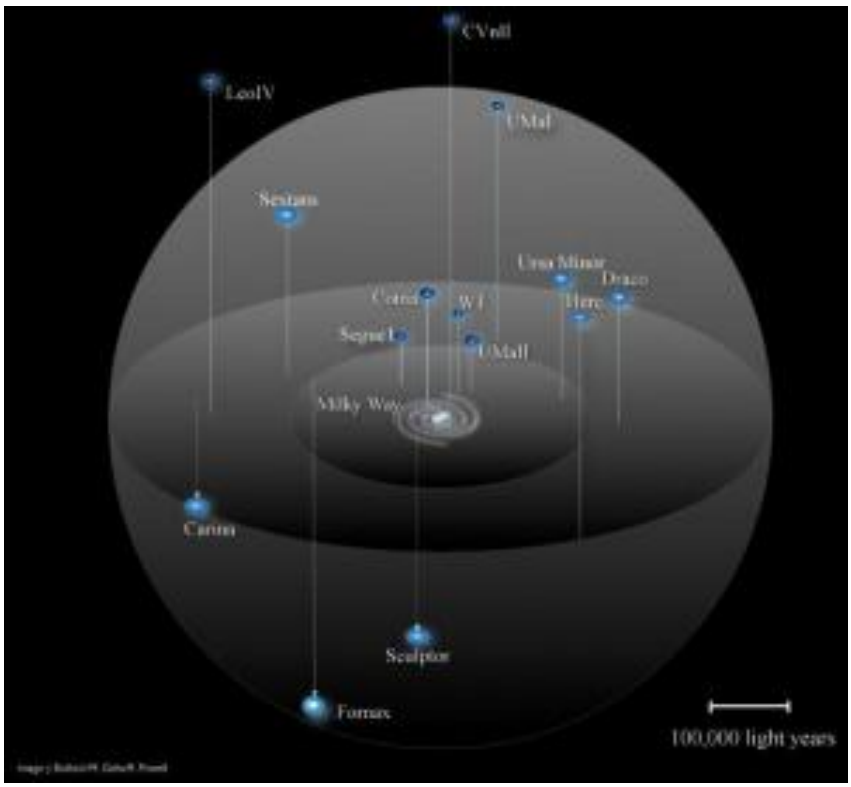
"My vision is that patients with aortic disease receive comprehensive, multi-specialty care for this unique condition," Schwartz said.

Tuchek is a leading enroller in a second multi-center clinical trial of the new stent graft, which is made by Medtronic, and he is a consultant to the company.

Adapted from materials provided by Loyola University Health System.

http://www.sciencedaily.com/releases/2008/08/080827100822.htm

Minimum Mass For Galaxies Discovered: Breakthrough Sheds Light On Mysterious Dark Matter



Satellite galaxies studied by UCI researchers that are within 500,000 light-years from the Milky Way. (Credit: J. Bullock/M. Geha/R. Powell; Image courtesy of University of California - Irvine)

ScienceDaily (Aug. 28, 2008) — By analyzing light from small, faint galaxies that orbit the Milky Way, UC Irvine scientists believe they have discovered the minimum mass for galaxies in the universe – 10 million times the mass of the sun.

This mass could be the smallest known "building block" of the mysterious, invisible substance called dark matter. Stars that form within these building blocks clump together and turn into galaxies.

Scientists know very little about the microscopic properties of dark matter, even though it accounts for approximately five-sixths of all matter in the universe.

"By knowing this minimum galaxy mass, we can better understand how dark matter behaves, which is essential to one day learning how our universe and life as we know it came to be," said Louis Strigari, lead author of this study and a McCue Postdoctoral Fellow in the Department of Physics and Astronomy at UCI.

Study results are published Aug. 28 in the journal Nature.

Dark matter governs the growth of structure in the universe. Without it, galaxies like our own Milky Way would not exist. Scientists know how dark matter's gravity attracts normal matter and causes galaxies to form. They also suspect that small galaxies merge over time to create larger galaxies such as our Milky Way.

The smallest known galaxies, called dwarf galaxies, vary greatly in brightness, from 1,000 times the luminosity of the sun to 10 million times the luminosity of the sun. At least 22 of these dwarf galaxies are known to orbit the Milky Way. UCI scientists studied 18 of them using data obtained with the Keck telescope in Hawaii and the Magellan telescope in Chile, with the goal of calculating their masses. By analyzing stars' light in each galaxy, they determined how fast the stars were moving. Using those speeds, they calculated the mass of each galaxy.

The researchers expected the masses to vary, with the brightest galaxy weighing the most and the faintest galaxy weighing the least. But surprisingly all dwarf galaxies had the same mass – 10 million times the mass of the sun.

Manoj Kaplinghat, a study co-author and physics and astronomy assistant professor at UCI, explains this finding using an analogy in which humans play the role of dark matter.

"Suppose you are an alien flying over Earth and identifying urban areas from the concentration of lights in the night. From the brightness of the lights, you may surmise, for example, that more humans live in Los Angeles than in Mumbai, but this is not the case," Kaplinghat said. "What we have discovered is more extreme and akin to saying that all metro areas, even those that are barely visible at night to the aliens, have a population of about 10 million."

Since dwarf galaxies are mostly dark matter – the ratio of dark matter to normal matter is as large as 10,000 to one – the minimum-mass discovery reveals a fundamental property of dark matter.

"We are excited because these galaxies are virtually invisible, yet contain a tremendous amount of dark matter," said James Bullock, a study co-author and director of UCI's Center for Cosmology. "This helps us better understand the particle that makes up dark matter, and it teaches us something about how galaxies form in the universe."

The scientists say clumps of dark matter may exist that contain no stars. The only dark matter clumps they can detect right now are those that are lit by stars.

Scientists hope to learn about dark matter's microscopic properties when the Large Hadron Collider in Switzerland becomes operational later this year. The device will accelerate two beams of nuclei in a ring in opposite directions and then slam them together to recreate conditions just after the Big Bang. By doing this, scientists hope to create the dark matter particle in the lab for the first time.

Several UCI physicists are working on this international project. Joining UCI scientists on the galaxy study were Joshua Simon of the California Institute of Technology, Marla Geha of Yale University, Beth Willman of the Harvard-Smithsonian Center for Astrophysics, and Matthew Walker of the University of Cambridge.

The research was funded by a grant from the National Science Foundation and a donation from Gary McCue to the UCI Center for Cosmology.

Adapted from materials provided by University of California - Irvine.

http://www.sciencedaily.com/releases/2008/08/080827163812.htm

Technology That Outthinks Us: A Partner or a Master?

By JOHN TIERNEY

SAN DIEGO

In Vernor Vinge's version of Southern California in 2025, there is a school named Fairmont High with the motto, "Trying hard not to become obsolete." It may not sound inspiring, but to the many fans of Dr. Vinge, this is a most ambitious — and perhaps unattainable — goal for any member of our species.

Dr. Vinge is a mathematician and computer scientist in San Diego whose science fiction has won five Hugo Awards and earned good reviews even from engineers analyzing its technical plausibility. He can write space operas with the best of them, but he also suspects that intergalactic sagas could become as obsolete as their human heroes.The problem is a concept described in Dr. Vinge's seminal essay in 1993, "The Coming Technological Singularity," which predicted that computers would be so powerful by 2030 that a new form of superintellligence would emerge. Dr. Vinge compared that point in history to the singularity at the edge of a black hole: a boundary beyond which the old rules no longer applied, because post-human intelligence and technology would be as unknowable to us as our civilization is to a goldfish.

The Singularity is often called "the rapture of the nerds," but Dr. Vinge doesn't anticipate immortal bliss. The computer scientist in him may revel in the technological marvels, but the novelist envisions catastrophes and worries about the fate of not-so-marvelous humans like Robert Gu, the protagonist of Dr. Vinge's latest novel, "Rainbows End."

Robert is an English professor and famous poet who succumbs to Alzheimer's, languishing in a nursing home until 2025, when the Singularity seems near and technology is working wonders. He recovers most of his mental faculties; his 75-year-old body is rejuvenated; even his wrinkles vanish.

But he's so lost in this new world that he has to go back to high school to learn basic survival skills. Wikipedia, Facebook, Second Life, World of Warcraft, iPhones, instant messaging — all these are quaint ancestral technologies now that everyone is connected to everyone and everything. Thanks to special contact lenses, computers in your clothes and locational sensors scattered everywhere you go, you see a constant stream of text and virtual sights overlaying the real world. As you chat with a distant friend's quite lifelike image strolling at your side, you can adjust the scenery to your mutual taste — adding, say, medieval turrets to buildings — at the same time you're each privately communicating with vast networks of humans and computers.

To Robert, a misanthrope who'd barely mastered e-mail in his earlier life, this networked world is a multitasking hell. He retreats to one of his old haunts, the Geisel Library, once the intellectual hub of the University of California, San Diego, but now so rarely visited that its paper books are about to be shredded to make room for a highbrow version of a virtual-reality theme park.At the library he finds a few other "medical retreads" still reading books and using ancient machines like laptops. Calling themselves the Elder Cabal, they conspire to save the paper library while they're trying to figure out what, if anything, their skills are good for anymore.

Dr. Vinge, who is 63, can feel the elders' pain, if only because his books are in that building. He took me up to the Elder Cabal's meeting room in the library and talked about his own concerns about 2025 — like whether anyone will still be reading books, and whether networked knowledge will do to intellectuals what the Industrial Revolution did to the Luddite textile artisans."These people in 'Rainbows End' have the attention span of a butterfly," he said. "They'll alight on a topic, use it in a particular way and then they're on to something else. Right now people worry that we don't have lifetime employment anymore. How extreme could that get? I could imagine a world where everything is piecework and the piece duration is less than a minute." It's an unsettling vision, but Dr. Vinge classifies it as one of the least unpleasant scenarios for the future: intelligence amplification, or I.A., in which humans get steadily smarter by pooling their knowledge with one another and with computers, possibly even wiring the machines directly into their brains. The alternative to I.A., he figures, could be the triumph of A.I. as artificial intelligence far surpasses the human variety. If that happens, Dr. Vinge says, the superintelligent machines will not content themselves with working for their human masters, nor will they remain securely confined in laboratories. As he wrote in his 1993 essay: "Imagine yourself confined to your house with only limited data access to the outside, to your masters. If those masters thought at a rate — say — one million times slower than you, there is little doubt that over a period of years (your time) you could come up with 'helpful advice' that would incidentally set you free."

To avoid that scenario, Dr. Vinge has been urging his fellow humans to get smarter by collaborating with computers. (See nytimes.com/tierneylab for some of his proposals.) At the conclusion of "Rainbows End," even the technophobic protagonist is in sync with his machines, and there are signs that the Singularity has arrived in the form of a superintelligent human-computer network. Or maybe not. Perhaps this new godlike intelligence mysteriously directing events is pure machine. Dr. Vinge told me he left it purposely ambiguous. "I think there's a good possibility that humanity will itself participate in the Singularity," he said. "But on the other hand, we could just be left behind."And what would happen to us if the machines rule? Well, Dr. Vinge said, it's possible that artificial post-humans would use us the way we've used oxen and donkeys. But he preferred to hope they would be more like environmentalists who wanted to protect weaker species, even if it was only out of self-interest. Dr. Vinge imagined the post-humans sitting around and using their exalted powers of reasoning:

"Maybe we need the humans around, because they're natural critters who could survive in situations where some catastrophe would cause technology to disappear. That way they'd be around to bring back the important things — namely, us."

http://www.nytimes.com/2008/08/26/science/26tier.html

Another Voice Warns of an Innovation Slowdown

By CLAIRE CAIN MILLER

MENLO PARK, Calif. — Judy Estrin, 53, has spent her entire career in Silicon Valley, a region that thrives on constant innovation. Ms. Estrin, the former chief technology officer of Cisco Systems, has founded four technology companies. Yet she is deeply worried that Silicon Valley — and the United States as a whole — no longer foster the kind of innovation necessary to develop groundbreaking technologies and sustain economic growth.

"I am generally not an alarmist, but I have become more and more concerned about the state of our country and its innovation," she said last week, explaining why she wrote her book, "Closing the Innovation Gap," which arrives in bookstores Tuesday. "We have a national innovation deficit."

Ms. Estrin's book is the latest call to action during the last several years by scientists, technologists and political leaders worried about the country's future competitiveness in technology.In 2005, the National Academies published "Rising Above the Gathering Storm," a report requested by Congress, which found that federal financing of research in the physical sciences was 45 percent less in 2004 than in 1976 and that 93 percent of students in grades five through eight learn science from teachers who do not hold degrees or certifications in the topics. In 2007, the book "Innovation Nation" by John Kao, a business consultant, revived the debate.

And this year, both presidential candidates have made government support of innovation and technology a central part of their campaign platforms.Still, not all technology watchers agree with Ms. Estrin about the extent of the innovation problem — or whether there is a problem at all. "The whole innovation crisis thing is a bit overblown," said Paul Saffo, a technology forecaster. Innovation in the natural world, in the form of mutation, is lethal, so species do it only when they are under dire stress, he said. "What makes Silicon Valley unique is that this place has stumbled onto a way to sustain innovation even when the place is doing well," he said.

Ms. Estrin argues that short-term thinking and a reluctance to take risks are causing a noticeable lag in innovation. She cites a variety of contributing factors. A decline in federal and university financing for research has dried up new ideas, she said. When research does produce new technologies, entrepreneurs and the venture capitalists who back them have been too cautious to make big bets — especially after the costly failures of the dot-com bust. If start-up companies do find financing, she said, new regulations make it hard for them to grow, and the focus of investors on short-term performance discourages companies from taking risks.

Ms. Estrin's suggestions for bolstering innovation range from the vague, like advising venture capitalists and entrepreneurs to take more risks, to the specific, like mandating that schools pay teachers higher salaries. Some of her prescriptions are unlikely to become reality, like her idea for a new government body modeled after the Federal Reserve that sets science policy without Congressional input.

Some thinkers on innovation agree with Ms. Estrin's assessment. "There is a remarkable telescoping in of vision and an unwillingness to make long-term bets," said Vinton G. Cerf, the chief Internet evangelist at Google.

Mr. Cerf led the development of the networking protocols that form the basic architecture of the Internet, a project to which Ms. Estrin contributed as a graduate student. He points to the Internet as an example of the need for long-term research and financing, since development of the technology used to transmit data online required two decades of government support.

Robert Compton, a venture capitalist and entrepreneur, said that the United States is losing its innovation edge to China and India. Chinese and Indian children are required to take more science courses than students in the United States, said Mr. Compton, who recently produced a documentary comparing high school education in the three countries. Of college graduates, 30 percent to 45 percent in India and China have engineering degrees, compared with 5 percent in the United States. Venture financing and patent applications are falling in Europe and the United States and rising in China and India, he said.

Most alarming to Mr. Compton is that 60 percent of engineering doctorates from American universities are granted to foreign nationals, but they are no longer staying here to work. "The American economy is not as exciting as China and India, and a lot of them are going back home," he said. Ms. Estrin and others acknowledge that the recent surge in financing for alternative energy companies is a sign that innovation is alive and well in some sectors. Still, she is concerned that investors will not have the patience to build these companies.

"If they treat these companies the same way they treated others — a couple years in, they need to see returns or cut the burn rate or start cutting people — they are not going to get to where we need to go," she said. Some who track innovation in the United States say the alarm bells are unnecessary and sound like a repeat of similar fears in past decades that turned out to be unfounded.

A June study from the RAND Corporation found that 40 percent of the world's spending on scientific research and development comes from the United States. The country employs 70 percent of the world's Nobel Prize winners and is home to 75 percent of the top 40 universities.

"The United States is still the world leader in science and technology," said the study's co-author, James Hosek. But Ms. Estrin said that the technologies at the root of new products like Apple's iPod or the Facebook social networking service were actually developed several decades ago. If a new round of fundamental innovation isn't seeded now, the country will suffer in the next decade.

She compared the situation to a tree that appears to be growing well, but whose roots are rotting underground.

"Too much of it is short-term, incremental innovation, and the roots of the tree aren't happy," she said.

http://www.nytimes.com/2008/09/01/technology/01estrin.html?_r=1&th&emc=th&oref=slogin

Revisiting Coen Country for Odd Men

By BRUCE HEADLAM

"SOMETHING just went horribly wrong," he said.

The sound of hysterical laughter is heard.

That line of dialogue and the stage direction that follows could have plausibly been found in many of the 13 major movies created by the Coen brothers: black comedies like "Blood Simple," "Barton Fink" or "Fargo" where invariably something does go horribly wrong.

Here, however, the speaker is Joel Coen, and the laughter is provided by Ethan, his younger brother (by three years). They were responding to the question of whether their big night at the Academy Awards last February — four Oscars for "No Country for Old Men," including best picture — changed the brothers' outlook on the film industry, or their place in it, or in any way represented an apotheosis of their 24-year career as darlings of art-house cinema.

Apparently not. According to the Coens, who spoke by phone from their hometown, Minneapolis, where they are currently shooting their next movie, the Oscars were barely an interruption.

"It was very amusing to us," Ethan said.

"Went right into the 'Life is strange' file," Joel said.

The Coens' "Life is strange" file must be overflowing by now. For more than two decades they have made popular movies — some loved by critics, some loathed — by following a simple formula: Typically, a slightly down-on-his luck protagonist driven by a single motivating belief ("The Dude abides," "I'm a writer") gets involved in a low-level criminal plot involving kidnapping or extortion, setting off a chain reaction of complications and reversals. And more often than not, somebody gets shot in the face.

Their steady progress as filmmakers contradicts the prescribed path for independent (or at least independent-minded) directors in Hollywood: Make a few small-budget movies, maybe in a genre like

film noir, then climb the Hollywood pay scale until, like Bryan Singer or Christopher Nolan, you're given the big-budget summer extravaganza.

What keeps filmmakers on this path — other than money — is the ability to make the kind of films they want. The Coens have been able to navigate their way all along, without once setting foot on a "Batman" soundstage.

"We've never navigated anything," Ethan said. "We've been lucky."

It's not luck, however, that the two have been working in lockstep their whole Hollywood careers.

Sometimes Ethan, 50, is credited as the writer, and sometimes Joel, 53, as director. But in reality both conceive the film, write the screenplay and direct, and edit under the joint pseudonym Roderick Jaynes. You think your family is close? These guys finish each other's movies.

That may work wonderfully on the set, where actors call them the Two-Headed Director. In an interview, however, the Coens are tough sledding. Like many close brothers they have developed an almost impregnable wall of in-jokes and verbal shorthand broken up by inexplicable fits of laughter, shared references and large inaudible patches when they speak over each other in a race to the next punch line.

Their new movie, "Burn After Reading," is set in Washington, or rather in the gray area between the old file-and-dagger Washington of Allen Dulles and the creeping suburbs that surround it. Frances McDormand, Joel's wife, plays Linda Litzke, a literally wide-eyed employee of Hardbodies Fitness gym, whose signature line, "I'm trying to reinvent myself," underscores her belief that four expensive plastic surgeries will help her meet a better class of man on Internet dating sites.

Through a series of strained coincidences (if plots had their own Hollywood guild, "Burn After Reading" wouldn't qualify for a union card), Linda receives a computer disk containing a draft of a memoir written by Osbourne Cox (John Malkovich), an angry alcoholic relic of the C.I.A. whose wife (Tilda Swinton) is having an affair with a federal marshal and aging Lothario (George Clooney). Linda decides to trade the memoir for cash, aided by a dimwitted personal trainer played by Brad Pitt, showing again that he's a great character actor in a leading man's body.

With its coldly satirical tone, stylized dialogue and broadly drawn characters, "Burn" will feel like familiar territory for longtime fans, a return to Coen Country for Odd Men. Is "Burn" a deliberate return to form, a step away from being Very Important Oscar-Winning Filmmakers? "It was nothing like that," Ethan said. "To tell you the truth, we started writing down actors we wanted to work with."

One was Richard Jenkins, who has appeared in three Coen films, starting with "The Man Who Wasn't There" in 2001.

"They're incredibly consistent, absolutely the same," said Mr. Jenkins, who has also worked with Hollywood's other best-known brother team, Bobby and Peter Farrelly. Those filmmakers have more defined roles, he said, but the Coens are almost interchangeable on the set when working with the actors. "I can't imagine them not being together making a movie. I can't think of one without the other."

The Two-Headed Director is one way to think about the Coens. Another — to borrow a concept from the horror movies they grew up on — is that they share the same brain, one cut crosswise. Ethan, whose first reaction to almost any question is to reject the premise out of hand with "No, that's not it" or "I don't remember," occupies the lower half, and Joel, who tends to pause, then provide a slightly more politic answer, occupies the other.

Together the Coens, like any divided brain, have little capacity for abstraction or intellectualism, and they resist delving into the philosophy or the processes underpinning their films. Analyzing their work, Joel says, "is just not something that interests us." Profiles of the pair frequently mention that Ethan wrote his senior thesis at Princeton on Wittgenstein — the sort of biographical detail film-studies types love — but, when asked, Ethan said he "can't honestly remember" what he wrote.

The sons of academics, they were raised in a heavily Jewish section in Minneapolis. But asking the Coens how growing up there affected their movies is like asking J .R. R. Tolkien how much time he spent in Middle-Earth before writing "The Hobbit."

Their next film, which they're working on now, is based on their childhood, but beyond that, they give no answers to how their city, its social structure or the dialect they heard as relative outsiders affected their work. "Scandinavian. That about sums it up," Joel said.

They will cop to this: They watched a lot of television. Now in their mid-50s, they're part of the last generation of filmmakers with a serendipitous relationship to old Hollywood, before VHS and infomercials, when being a cinephile meant watching whatever was on the late show.

"There wasn't HBO or movies on demand. There wasn't a lot of choice," Joel said, adding that they watched "a lot of Hercules movies" and that they and Mr. Clooney have wanted to do a Hercules movie for years.

"The local affiliate had the entire Joseph E. Levine catalog," Ethan said. "A lot of horror, but he also owned Fellini's movies, so occasionally, '8 ½' would be mixed in. All dubbed."

"Badly dubbed," Joel agreed. "Marcello sounded like Hugh Grant. Very stuttery."

In their teens they began to make their own movies on Super 8 millimeter, starting with a short film, "Henry Kissinger, Man on the Go." "It didn't have a strong narrative," Joel said. "It was really based on the fact that Ethan had a striking resemblance to Kissinger," establishing a Coen brothers theme early: the desperate character looking for some kind of payoff.

After college — Princeton for Ethan, New York University for Joel — they had various jobs film editing before making "Blood Simple" in 1984. Since then they've moved with deliberateness of an airport novelist, putting out a film at least once every two years. Even "No Country," an adaptation, was sold on the basis of their script. "The alchemy was already there on the page," said Daniel Battsek, the chief executive of Miramax, which co-produced the film. "The only question of whether it would still be there on screen."

One explanation for their longevity is money — the lack of it. All told, the Coens have spent an estimated $340 million, the cost of a couple of summer blockbusters.

"They control their own destiny," said Eric Fellner, co-chairman of the British production company Working Title, which has been involved in five Coen brothers films, including "Burn After Reading." "I've talked to them many times about doing something bigger, something smaller, something more commercial. It's very hard to find anything that interests them."

Joel said: "To be quite honest our movies have never broken any records in terms of box office. We've never operated at that level. We've never threatened the bottom line of any company that finances us. So they're happy to finance us, because the stakes are so low."

"Even our Hercules movie would not be terribly expensive," he said. (The sound of laughter is again heard.)

Coen brothers films may be cheap, but they're not small. Long before "No Country" they built large frames for their films, then filled in their themes of morality, violence and the failure of communication using everyday vernacular, like the gangster slang of "Miller's Crossing" or the flat Minnesota accents of "Fargo." With apologies to Ethan's Princeton thesis adviser, that part is very Wittgenstein.

The opening scenes of "Burn After Reading," inside C.I.A. headquarters, make it appear that the Coens are flirting with another genre, in this case the paranoid thrillers of the 1970s, like "Three Days of the Condor" or "The Parallax View." Then the film takes a sharp twist into a gray zone without any apparent moral order — or at least the kind embodied in "No Country" by Carla Jean Moss or in "Fargo" in the final speech given by Marge, the policewoman played by Ms. McDormand.

"No character offers that kind of perspective" in "Burn," Ethan says. Even Cox's old superiors at the C.I.A. (played by J. K. Simmons and David Rasche), who the brothers wanted to function "like a Greek chorus," seem bewildered by events and — like many real C.I.A. agents, one suspects — just close the file rather than dwell on how things could go so wrong.

The Coens are big Hitchcock fans, and "Burn After Reading" has a MacGuffin (the device to move the plot along), in this case Cox's memoir. What's striking is that this MacGuffin, unlike the suitcase in "No Country," is worthless. "Why in God's name would they think that's worth anything?" the analyst's wife says in the film.

Ethan said the choice was deliberate: "We liked that idea. There's nothing at the center."

It's maybe the oddest turn, as if the audience watching "The Maltese Falcon" for the first time knew that the bird was a fake all along. But a final attempt to draw out the Coens about the meaning of "Burn After Reading" ends the interview to the evident relief of both brothers, who suddenly relax and seem ready to talk.

"Hey," Joel said, his voice brightening, "didn't Karl Popper go after Wittgenstein with a poker?"

http://www.nytimes.com/2008/08/31/movies/31head.html?th&emc=th

Love and Dance: Two Obsessions, One Classic Film

By ALASTAIR MACAULAY

SIXTY years ago next week the Powell and Pressburger film "The Red Shoes" opened to admiring reviews in its native Britain without causing any immediate box office sensation. Nobody guessed that it would become one of the highest-earning British movies of all time. Why would they? This is a film about ballet as obsession, and it ends not in its heroine's glory but in her death.

It often looks as though it will turn into something much more conventional. Later ballet films and many ballet novels have told their versions of the standard story of a woman's choice: career success or married love. In "The Turning Point" (the hit ballet movie of 1977) Anne Bancroft and Shirley MacLaine represent those two choices, 20 years after they've made them. This polarity was the stuff of so many women's movies of the 1930s and '40s, just now shifted to ballet: Bancroft is the famous ballerina, Ms. MacLaine the fulfilled wife and mother. And the film's clichés only begin there.

The same choice permeates "The Red Shoes," but it is presented to the aspiring ballerina Victoria Page (Moira Shearer) at a melodramatically high pitch. Within the film's first hour Lermontov (Anton Wallbrook), the boss of what is evidently the world's greatest international ballet company, has snarlingly announced: "You cannot have it both ways. The dancer who relies on the doubtful comforts of human love will never be a great dancer. Never!" Victoria, or Vicky, in full makeup and about to go on stage in the corps de ballet of "Giselle," hears his words. Indeed they seem aimed at her ears.

Lermontov, the embodiment of the possessive impresario, was based on Serge Diaghilev, who had fired his two greatest male stars, Vaslav Nijinsky (in 1913) and Léonide Massine (in 1921), because they had been his lovers but switched tracks to marry women without his consent. The relationship Lermontov has with his dancers also anticipates those that George Balanchine would have with Suzanne Farrell and her husband, Paul Mejia. The complications of that triangle reached their climax in 1969, when the two dancers, amid intense pressure about his casting decisions, suddenly quit New York City Ballet.

Only when "The Red Shoes" reached America did it take off, converting unnumbered thousands of girls to ballet. It had a direct effect on the colossal success, in 1949, of the first American tour of the Sadler's Wells Ballet, the British ballet company that included the film's heroine, the red-headed Shearer, and one of its dancer-choreographers, the intensely theatrical Robert Helpmann. The success of the Sadler's Wells Ballet — in which Margot Fonteyn enjoyed a triumph above and beyond those of Shearer and Helpmann, and which went on to make extensive tours of North America, at least once every two years until 1976 — helped the popularity of other companies. Balanchine's young New York City Ballet in particular profited. Ballet, thanks in large part to "The Red Shoes," snowballed.

One of those girls whom "The Red Shoes" converted to ballet was the 9-year-old Lynn Springbett, growing up in Vancouver. She became Lynn Seymour, the supreme dramatic ballerina of the last half of the 20th century and the most remarkably original dancer in the history of the Royal Ballet (as the Sadler's Wells Ballet became in 1956). In her autobiography Ms. Seymour called the movie "one of the revelatory experiences of my childhood." Yet you look at the movie, and you marvel that these girls wanted to devote themselves to such an art.

The film's story keeps turning and turning the screw. Vicky becomes Lermontov's latest star in the new ballet of "The Red Shoes" only to discover love offstage with its composer, Julian Craster (Marius Goring). Like Nijinsky, Massine and Ms. Farrell, Vicky marries Craster against Lermontov's wish and finds herself unemployed. Later she returns to Lermontov's ballet company without telling Craster. Finally, when both Lermontov and Craster are threatening to withhold her twin needs — dance and love — the red ballet slippers take matters into their own demonic, death-dealing grip.

They propel her out of her dressing room, out of the Monte Carlo opera house where she is about to dance in (of course) "The Red Shoes," into a leap off a balcony (sheer "Tosca") and into the path of an oncoming train (sheer "Anna Karenina"). The film begins and ends with the image of a flame (stardom, life's brief candle) poised above the red shoes. It is those point shoes that bring the flame's greatest brightness and its final extinction.

Melodrama! Kitsch! Ham! Entirely undistinguished choreography! Add that its "Red Shoes" ballet could never be danced onstage. (Its dissolving scene changes are sheer cinema, and the ballerina role is too nonstop for any dancer's stamina.)

Even so, "The Red Shoes" remains a classic. Hans Christian Andersen, who wrote the original story, was the son of a shoemaker, and his own dreams of becoming a dancer were disappointed. Shoes and feet recur, often painfully, in his stories, and never more cruelly than here. The direction also brings out dark pressures that feel more like the dark force of E. T. A. Hoffmann, the great storyteller who had powerfully influenced Andersen in the first place. Lermontov: "Why do you want to dance?" Vicky: "Why do you want to live?" Lermontov: "I don't know, exactly, but I must." Vicky: "That's my answer too."

Dance isn't just Vicky's vocation; it's her destiny. The real force of "The Red Shoes" lies in the tension between impresario and ballerina. Wallbrook plays Lermontov not quite realistically; the story's feverish melodrama comes from him, and he seems at once absurd and hypnotic. As Vicky, Shearer is compelling in the opposite way, for her lack of exaggeration. Her dancing glows; her manner is demure. In consequence she seems more real, more like us, than any other character.

My own favorite episode, told with wonderful expansiveness by the directors, Emeric Pressburger and Michael Powell with scarcely a word spoken for two and a half minutes (and no dancing), is when we feel destiny at its most seductively mysterious. We're in Monte Carlo. Lermontov has sent Vicky an invitation to meet him in the evening.

In gala haute couture she is driven in his open-top car high above the Mediterranean coast. The music builds to a climax. The chauffeur deposits her at a half-closed palace gate, behind which a brick staircase is covered in weeds. It's as if she had arrived at Sleeping Beauty's castle.

"Montez, mademoiselle," the chauffeur says, and he leaves her there. Suddenly it's near silence. Then, as she starts to climb the staircase, her cloak billowing behind her, we hear, inexplicably, a distant soprano voice in sirenlike song. As Vicky reaches the top and approaches the house, we see the sea.

The whole scene is the most mythic part of the film. Vicky seems to be moving into fairy tale, legend, out of time. Where is her journey leading? What's funny — and it is one of the many examples of how "The Red Shoes" manages to transcend its own melodramatic and kitschy nature — is that what awaits her inside the house are men at work in their shirt sleeves. Lermontov offers her the central role of the new ballet he is preparing with full sense of its importance, but he and his colleagues are men at work, and they soon allow her to depart.

Throughout "The Red Shoes" romantic fantasy rubs shoulders with the daily grind, yoked together by ballet. Though Lermontov was not a real-life person, the film shows us places and people who were already part of ballet history: the Royal Opera House amid the old Covent Garden fruit-and-vegetable market; Marie Rambert zealously watching a "Swan Lake" performance in the little Mercury Theater; the opera houses of Paris and Monte Carlo; and Massine dancing his original role in "La Boutique Fantasque," which he had choreographed for Diaghilev almost 30 years before. These were living legends; "The Red Shoes" enshrines them.

The film pays fetishistic attention to all of ballet's detailed contrivance: the elaborate makeup, the constant audience-consciousness, the endless attention to minutiae of musical timing and technical articulation. Brilliantly it closes in on one particular feature of ballet technique: the way dancers "spot" in turns, fixing their eyes on one focal point while turning so that their head is the last part of the body to turn but the first to arrive. When Vicky dances the Swan Queen at the tiny Mercury Theater in London, she finds that — by chance or fate — she is spotting on Lermontov himself. She had not known he was present. He is sizing up her star potential.

The camera here becomes Vicky: spotting, turning, spotting. What it shows is what she sees: Lermontov (staring fixedly back), whirl, Lermontov.

These images turn "The Red Shoes" into what we might call a study of the psychopathology of ballet. Physical fixations and psychological obsessions meet as one. Ms. Seymour recounts in her autobiography that, when she saw it, "the ballet became a state of heart."

http://www.nytimes.com/2008/08/31/arts/dance/31maca.html?th&emc=th

Experts poised for rare frog hunt

By Rebecca Morelle
Science reporter, BBC News, Costa Rica

Scientists are set to begin a hunt for the some of the world's rarest frogs in Costa Rica, including the iconic golden toad, last seen some 20 years ago.

A team from Manchester University and Chester Zoo are in Costa Rica to track down the highly endangered creatures.

BBC News will follow their trek deep into the cloud forests of Monteverde.

Amphibian numbers around the world have crashed, in part because of a deadly fungus. Costa Rica has been particularly badly hit.

Expedition leader Andrew Gray, from the University of Manchester's Manchester Museum, said: "Costa Rica's highlands used to be major biodiversity hotspots - but in many areas, amphibian populations have been completely decimated."

Killer fungus

In the late 1980s, herpetologists around the world found that amphibian populations were suffering unprecedented declines, but they struggled to understand exactly why.

A decade later, researchers isolated a previously unknown fungus, *Batrachochytrium dendrobatidis* , which was infecting amphibians, effectively suffocating them by making it impossible for them to breathe across their skin.

Recently, the scientists working on the Global Amphibian Assessment estimated that one-third of all amphibians were threatened with extinction and about 120 species had already become extinct since the 1980s.

Many believe the disease caused by the chytrid fungus is a key factor for this crash. Other causes are thought to include habitat destruction and changes in climate.

Frog rediscovery

Countries in Central America have been particularly badly affected by the deadly chytrid fungus, which is widespread there. A great deal of effort is now being put into place to safeguard any remaining species.

> **To find this species last year that was thought to be extinct at the same times as the golden toad was incredible**
> Andrew Gray

Andrew Gray said: "For the last 10 years, I've been working with others to ensure the future for frogs that have so far escaped extinction.

"One of the main things I have been doing is establishing breeding populations in Manchester Museum for a number of very, very rare species - including the splendid leaf frog (*Cruziohyla calcarifer*), the yellow-eyed leaf frog (*Agalychnas annae*) and the lemur leaf frog (*Hylomantis lemur*).

"I've also been working with the Costa Rican authorities and scientists to put conservation measures into place at the sites where any rare frogs are found."

Last year, Mr Gray caught a glimpse of the *Ithsmohyla rivularis* in the cloud forests of Monteverde - a frog that was thought to have gone extinct about 20 years ago.

He said: "To find this species last year that was thought to have become extinct at the same time as the golden toad was incredible - it is the rarest tree frog in the world."

He has now been given special permission by the Costa Rican authorities to collect some of the frogs to take back to Manchester.

He told the BBC: "We are returning to thoroughly search the site in the hope of finding more specimens.

"It's not going to be easy - they live deep in the Monteverde rainforest, they are only a couple of centimetres in size and they only come out in the dead of night - and while the males do call, the females don't make a sound."

'Never say never'

The rediscovery of *Ithsmohyla rivularis* has spurred the team on to also try to seek out a golden toad (*Bufo pereglines*).

This colourful amphibian, which scientists only discovered in 1966, became the iconic symbol of amphibian decline. In 1987 there were approximately 1,500 of the toads, but just two years later it had vanished from the face of the rainforest.

Mr Gray said: "We are going to be trekking through an area where the golden toad used to thrive. It is very unlikely we will find one - but as last year's discovery showed us, never say never."

Please turn on JavaScript. Media requires JavaScript to play.

The Manchester team has been looking at the properties of frogs' skin

While in the rainforest, the team will also be trying to track down the miniature red-eyed tree frog (*Duellmanohyla uranochroa*) - a species on the brink of extinction - to investigate how some frogs may be able to prevent the chytrid fungus from taking hold.

This is a unique opportunity to study the frogs in their natural habitat
Mark Dickinson

Previous research has shown that some species of tree frog have a special pigment in their skin that enables them to reflect light, allowing them to "sunbathe" without drying out.

Physicist Mark Dickinson, from Photon Science Institute at the University of Manchester, will be taking a spectrometer into the field to investigate how different frog species reflect light.

He said: "So far, I've only been able to investigate captive frogs in the lab. This is a unique opportunity to study the frogs in their natural habitat."

The team believes that the ability to sit out in the Sun may allow the frogs' skin to heat up just enough to kill off chytrid - preventing the disease from taking its grip.

Some of the team will also be heading to the last known breeding site of the green-eyed frog (*Lithobates vibicarius*) where Chester Zoo is helping to support a conservation programme.

BBC News will be keeping track of the researchers' progress over the next two weeks.

Do you have a question for the scientists?

Send your comments and queries to the experts using the post form below, or text 61124.

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

Name
Your E-mail address
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Phone number (optional):
Comments
Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7591050.stm

Published: 2008/09/01 04:56:01 GMT

Farm pregnancy 'cuts asthma risk'

Living on a farm during pregnancy may help reduce the chance of the child developing asthma, eczema and even hayfever, say scientists.

The New Zealand researchers suggest that exposure to animals and the bacteria they carry may affect the foetus's immune system.

Writing in the European Respiratory Journal, they said exposure before and after birth halved the risk.

But experts warn some animals carry infections which may harm the baby.

The research, carried out at Massey University, adds to other studies which have suggested that living on a farm, with regular contact with animals, during the early years of life, could cut the risk of asthma and other allergic diseases.

But the study of more than 1,300 farmers' children goes further, suggesting that this protection could start building even before birth.

It found that the greatest apparent protection - a 50% reduction in asthma, and an even greater reduction in eczema and hay fever - was gained by children whose mothers had been exposed to farm life during pregnancy, and who currently lived on a farm.

The reasons why this might happen are unclear, although they are likely to be related to the way that the child begins to develop its immune system.

Milk bacteria

Living on a farm means frequent contact with animal bacteria, perhaps through the consumption of unpasteurised milk, or contact with the animals directly.

The researchers suggested that this might suppress the production of particular immune cells linked to the development of asthma.

However, they suggested that while exposure during pregnancy might be useful, it might only persist if the child was exposed after its birth as well.

The findings are unlikely to lead to any change in current advice to pregnant women, which urges caution about contact with certain farm animals.

In particular, an infection which can cause miscarriage in pregnant ewes can lead to the same result in humans.

The faeces of other animals can also carry infections which can affect a pregnancy.

Dr Elaine Vickers, research manager at Asthma UK, said: "This study adds to existing evidence supporting the hygiene hypothesis, which states that early exposure to potential allergens results in a reduced risk of asthma development.

"However, the causes of asthma are still largely unknown and the processes involved in asthma development are incredibly complicated, including family history, environment and lifestyle."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7586328.stm

Published: 2008/08/30 22:58:02 GMT

Chemical coat to mean drier socks

Almost any surface or fabric can be made waterproof but remain breathable thanks to a former military technology.

The process was originally developed to ensure soldiers' clothing remained impermeable to chemical weapons.

Shoe maker Hi-Tec has signed a deal with the developers of the process to use the technology to waterproof many of its shoes.

The first commercially available shoes treated with the process were shown off in London this week.

Chemical coat

The technology was funded by the Ministry of Defence and developed at its Defence Science and Technology Laboratory for making military clothing resistant to nerve agents.

The process - dubbed ion-mask by its inventors - works using a chemical based on the element fluorine. In a closed chamber, the chemical is vaporised and attaches, molecule by molecule, to all the fibres in a fabric.

The chemical makes the surface "hydrophobic" or water-repelling, so that instead of water spreading out it forms droplets on the surface.

The chemical coating covers just the fibres, rather than forming a "skin" across the whole surface, as with currently available waterproofing treatments. That means the spaces between fibres remain open and the fabric is still breathable.

"The normal way in which you'd make a shoe waterproof is put a membrane inside the shoe; Gore-Tex is a well-known example," says Ian Robins, business development director of P2i, the company marketing the process.

"That's effectively putting a plastic bag inside the shoe. No water gets inside your shoe, but at the same time that reduces the breathability both in terms of sweat and of heat escaping."

Shoe fabric made with the ion-mask process was tested for breathability in an air-flow test, outperforming commercial waterproof fabrics such as Gore-Tex by more than a factor of 100, P2i claims.

The shoes were also subjected to flexing and wear tests, maintaining their breathable waterproof properties even after 100,000 flexes.

The fabrics are also inherently stain-resistant and easier to clean, says P2i.

Dr Robins says coating a pair of shoes using the ion-mask process requires just a tenth of a gram of the fluorine compound, and costs in the region of a few dollars - significantly less than the cost of integrating membranes like Gore-Tex into a pair of shoes.

The process can easily be applied to any garments or any material, and Dr Robins suggests that it might also become the basis for a separate after-purchase service business, like dry cleaning.

It can also be used to waterproof outdoor gear. High Street outdoor equipment retailer Millets, owned by Black's Leisure Group, will be stocking the men's Hi-Tec ion-mask shoes in 75 stores.

"This could change waterproof footwear as we know it," says Michelle Swan, a senior footwear buyer at Black's.

She said the company would keep an eye on the "revolutionary" technology and perhaps use it in other areas of its business.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7587702.stm

Published: 2008/08/29 12:28:11 GMT

Gene 'links food and fertility'

A genetic link controlling both appetite and fertility has been found by US researchers.

A gene, TORC1, appears to act as a "master switch", switching off food intake and allowing pregnancy.

The gene probably offered an evolutionary advantage, by stopping women getting pregnant in times when food was scarce, the researchers said.

Mice lacking the gene were unable to reproduce, and grossly overweight, reported the journal Nature Medicine.

Both underweight and severely overweight women may have fertility problems, and the research at Salk Institute in California is suggesting that TORC1 may play a role in both.

> **It likely plays a pivotal role in how much we, as humans, eat, and whether we have offspring**
> Professor Marc Montminy
> Salk Institute

In normal circumstances, when food intake is sufficient, fat cells produce a hormone called leptin, which in turn, say the researchers, switches on TORC1, decreasing appetite, and enabling reproduction.

In times of food shortage, a lack of leptin leaves TORC1 switched off, leaving appetite unchecked and preventing pregnancy, which would use too much of a woman's energy.

This, said the Salk researchers, would be an important evolutionary advantage in times of famine.

However, they argued that a subtle mutation in the TORC1 gene might also play a role in obesity, by failing to pass on the "stop eating" signal even when food is plentiful.

If passed from generation to generation, it could mean an inherited extra risk of obesity, they said.

The failure of the gene to work properly could also affect fertility, by not allowing reproduction to proceed.

Infertile and overweight

To test this the scientists bred mice without TORC1, which after just eight weeks began to gain weight, becoming obese. In addition, both sexes were infertile.

Professor Marc Montminy, who led the study, said that TORC1 presented a good target for drugs.

He said: "This gene is crucial to the 'daisy-chain' of signals that run between body fat and the brain.

"It likely plays a pivotal role in how much we, as humans, eat, and whether we have offspring."

Professor Stephen Bloom, from Imperial College London, said that the findings made sense, although it was too early to say whether TORC1 was the most important point in the "cascade" of signals generated by leptin.

He said: "It's an extremely interesting observation. We've known for a long time that if you haven't got any fat as a girl your periods stop, and if you give leptin, the periods start again.

"However, I don't think they have yet established whether this is just a stepping stone, or the key link in the chain."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7588093.stm

Published: 2008/08/31 23:00:13 GMT

Weak teachers 'put off pupils'

Weak teachers can put children off learning and are too hard to sack, the chief inspector of schools has warned.

Christine Gilbert, head of the Office for Standards in Education (Ofsted), told the Sunday Telegraph pupils were being let down by inadequate teachers.

She said "parents should not have to put up with it".

However, the Department for Children, Schools and Families (DCSF) said: "The vast majority of our teachers are doing an excellent job."

Ms Gilbert said teaching rated as "satisfactory" was not good enough, especially in deprived areas.

Her comments come ahead of the start of a new academic year.

> **We are working with the General Teaching Council to make sure they use their powers, which include prohibiting someone from teaching**
> The Department for Children, Schools and Families

In the newspaper interview, Ms Gilbert called for schools to be able to fire underperforming staff more easily and criticised a "revolving door syndrome" which enabled poor to teachers move from school to school.

She said: "As I go round the country heads tell me how difficult it is to get rid of weak teachers.

"They say they start the procedure and they might be 18 months down the line and the teacher will move... we need to be thinking of ways of preventing that.

"That isn't Ofsted's role but I sympathise with head teachers about that."

But the DCSF said "record exam results this summer" pointed to "excellent" teaching standards, although it warned against complacency.

Mentoring scheme

A spokeswoman said: "The Children's Plan we published last December set out proposals to improve the performance of teachers who have the greatest difficulty in carrying out their role effectively, including a proposal to help underperforming teachers leave the profession if that is appropriate, and removing their Qualified Teacher Status.

"We are working with the General Teaching Council to make sure they use their powers, which include prohibiting someone from teaching, to make sure no child has to put up with a substandard teacher."

The DCSF said the system to help struggling teachers would include "continuous professional development, such as mentoring and help from the head, to improve on their classroom management and teaching skills".

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/7590539.stm

Published: 2008/08/31 11:38:37 GMT

'Two Cultures' Tension in Social Science

Key philanthropic and government programs offering grants for Ph.D. students appear to be excluding proposals for graduate students in sociology and political science, while favoring proposals from those in history, anthropology and a range of relatively small disciplines, such as art history and ethnomusicology, according to data released Friday.

The analysis was presented at the annual meeting of the American Political Science Association and focused on programs to support field research or international research. The issue is particularly important because the analysis comes at a time that many political scientists are urging the discipline to push those who focus on American government and politics to take a broader view, and to study other parts of the world as well. According to those who discussed the issue at the APSA meeting, a variety of factors — including biases and habits within disciplines — are hurting the "explanatory social sciences," in ways that are damaging to those fields and their graduate students.

Ronald Herring, a professor of government at Cornell University who focuses on South Asia, said that he first became concerned about the issue when he was on a board looking at fellowships for the American Institute of Indian Studies, which is the largest funder of support for graduate work in India. The year he looked at the situation, the success rates for political scientists and sociologists seeking grants were both zero. Nearly three-quarters of proposals in art history were accepted, two-thirds for history, and nearly half for anthropology. While the situation has since improved, Herring said he wondered why "some social sciences were being weeded out of area studies."

Asked Herring: "Are we entering a C.P. Snow world of 'two cultures'?"

While Snow lamented the lack of understanding between those in the humanities and the sciences, the two cultures seen as divided in the research presented Friday are the social sciences that are perhaps closer to the hard sciences and those that closer to the humanities. (Definitions are a bit mushy here, as some fields, such as history, were described at the session as a humanities-leaning social science while many historians view themselves as in the humanities.)

Whatever the causes, data presented suggest that political scientists and sociologists are at a distinct disadvantage in seeking certain kinds of graduate support. The data were presented by Rina Agarwala, assistant professor of sociology at Johns Hopkins University, and Emmanuel Teitelbaum, assistant professor of political science at George Washington University. In terms of raw numbers, they left little doubt that some social science fields get more than others. For the Fulbright-Hays Doctoral Dissertation Research Abroad program, for example, 31 percent of grants went to those doing work in history, 30 percent to anthropology, and 16 percent to regional studies, languages and literature. Political scientists gained only 5 percent of the awards — less than the 6 percent awarded to arts and ethnomusicology.

Relatively similar breakdowns were found in grants awarded by the National Science Foundation and the Social Science Research Council for similar programs supporting dissertation work abroad. Some of the data suggest that the trends are getting worse. For example, the Social Science Research Council's International Dissertation Research Fellowships, 10 years ago, were supporting 15 political scientists and 5 sociologists a year. Now each field gets two or three, a fraction of those going to anthropology and history.

The drops don't reflect a lack of applications, but lower success rates. Over the last 10 years of data for the SSRC program, anthropology's success rate had one year at 4 percent, but was otherwise between 5 and 8 percent. Since 2000, political science has been between 2 and 4 percent. Sociology, which used to be close to anthropology in success rates, has fallen to the 2 and 4 percent levels in recent years.

Notably, these shifts took place at a time that the composition of the selection committees for the fellowships was also changing, the Agarwala-Teitelbaum study found. In recent years, the committee has had one or two each from political science and sociology, while three or four each from history and anthropology. While history has been consistently high, political science used to be its equal, and anthropology's numbers have been growing on the panel as political science's have been shrinking.

At the National Science Foundation, the success rate for dissertation grant proposals for political science (20 percent) lags those for other fields, such as economics (37 percent), law and social sciences (53 percent) and cultural anthropology (27 percent, but with a larger grant total and many more grants given out than in other disciplines). But as Brian Humes, a program officer for the NSF who stressed he was sharing his opinions and not official agency policy, explained, separate panels are used to evaluate proposals, so the judges have plenty of knowledge of the various fields.

Humes said that certain problems tend to hold back political science proposals. He said that many of the proposals "don't provide a justification" for the funds. For instance, grad students will talk about their dissertation as a whole and not relate the grant's proposed trip to that work. Many other proposals, he said, don't suggest sufficient familiarity with the research challenges. In one case, an applicant had an interesting project for which he wanted to conduct research in French military archives, but the applicant admitted that he didn't know French. "When you add that you don't know French, you're cooked," said Humes.

Stathis Kalyvas, a professor of political science at Yale University, said that he sees the data pointing in part to ambivalence in political science about the value of field work. Many political scientists, he said, don't trust it at all and don't include it in their work. Others see "field work as an afterthought," and don't build it into their research agenda, but do field work to add "local color" to their work. This kind of approach isn't worth funding, he said.

But a "more promising" kind of field work, he said, involves research abroad that directly frames and analyzes various questions. But this kind of work requires advanced language and other skills, he said, and "you can't start from scratch."

While speakers noted problems within political science, they were also highly critical of the way those in other disciplines evaluate work by political scientists. David Waldner, a professor of politics at the University of Virginia, described the experience of being the lone political scientist on review panels of the Social Science Research Council that were dominated by anthropologists. "It's all about the discursive," he said. "They say things like, 'You do numbers, don't you?' " and that suggests an inappropriate focus, Waldner said.

Waldner quipped that he suspected that more grants went to the study of Javanese transgender musical performers than to all of political science.

At the same time, he said, the research council wants to be sure that something in political science gets funded. But this means that the grants go to political science that is "utter junk," but that appeals to anthropologists. "The squishier [proposals] were, the more the anthropologists would like them," he said. When political scientists try to raise issues of concern to the discipline, they are shot down, he said.

"If you say 'research design' in that room, you are having lunch by yourself," he said.

Kalyvas said that when he played a similar role on the review committee, he felt "alone" in questioning projects that didn't seem to have much merit. He said that political scientists tend to be tough on proposals from their discipline while members from other disciplines, especially small ones like ethnomusicology, "see themselves as protecting their turf."

The panel was originally supposed to also feature Nicole A. Stahlmann, program director for the dissertation grants at the Social Science Research Council. While a scheduling conflict prevented her from attending, she responded via e-mail to questions about the research and discussion at the meeting.

Stahlmann disputed the data on success rates and said that the gaps in grants reflect the disciplines, not any bias at the council. "It is not surprising that disciplines, such as history and anthropology, in which a higher proportion of dissertations are based on international on-site research, including ethnographic and archival research, win more awards," she said. Further, she said that while political science and sociology "once had larger proportionate engagement in on-site and especially fieldwork-based international research and closer relationships to the area studies fields in which students often gain

contextual knowledge and linguistic skills for such research," but don't have those ties now. Anthropology and history, she said, "have maintained stronger traditions" of this type.

The program intentionally includes the humanities, she said, based on the agreement with the Andrew W. Mellon Foundation, which supports the awards. "This is not a 'bias' but part of the funding agreement and the conceptualization of the program," she said.

As for the issue of whether the review panels have enough political scientists or sociologists, Stahlmann said that some of the panel members who are not in political science or sociology "have appointments in interdisciplinary programs" and "were trained in political science and sociology. The claim that these disciplines are underrepresented is false. Additionally, the committee composition reflects a search for regional as well as disciplinary expertise."

— Scott Jaschik

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/09/02/field.

Bonobos May Have Greater Linguistic Skills Than Previously Thought

The bonobo Panbanisha's use of turn-taking to achieve her aim is the basis of a paper written by Ph.D. candidate Janni Pedersen and published in the Journal of Integrative Psychological and Behavioral Science. (Credit: Great Ape Trust photo)

ScienceDaily (Sep. 2, 2008) — What happens when linguistic tools used to analyze human language are applied to a conversation between a language-competent bonobo and a human? The findings, published this month in the Journal of Integrative Psychological and Behavioral Science, indicate that bonobos may exhibit larger linguistic competency in ordinary conversation than in controlled experimental settings.

The peer-reviewed paper was written by Janni Pedersen, an Iowa State University Ph.D. candidate from Denmark whose interests in the language-competent bonobos at Great Ape Trust of Iowa led her to the United States, and William M. Fields, director of bonobo research at Great Ape Trust.

Their findings run counter to the view among some linguists, including the influential Noam Chomsky, professor emeritus of linguistics at the Massachusetts Institute of Technology, who argue that only humans possess and use language. In his hierarchy of language, Chomsky believes that language is part of the genetic makeup of humans and did not descend from a single primitive language evolved from the lower primate order, and it must include formal structures such as grammar and syntax.Fields said the publication opens an important new chapter in a decades-long debate about the linguistic capabilities of apes. "The resistance to this in the scientific community is enormous," he said. "For the first time, we have a student who is using linguistic tools that have normally been applied to humans now being applied to non-humans. This is a move toward using the kinds of methodology that are appropriate in ape language, based on Savage-Rumbaugh's 1993 monograph, Language Comprehension in Ape and Child."

For her paper, Pedersen analyzed a videotaped conversation between the bonobo Panbanisha and Dr. Sue Savage-Rumbaugh, now a scientist with special standing at Great Ape Trust, but a researcher at Georgia State University's Language Research Center when the video was made about 15 years old. Since 2000, students working in the bonobo laboratory have systematically reviewed archived video to track the development of competencies such as language in each of the bonobos for comparison with their current competencies."This is a long-term project, starting from the beginning of where we have data," Fields said. "All of this is contextualized with our current research and larger programs, such as forgiveness research. The students are looking at the earlier data, while investigators are looking at new data."

He expects Pedersen's paper to be the first in a series of many. "This paper serves as an investigation into the early ontogeny of these kinds of competencies," he said. "These papers will eventually be assembled in a larger volume to look at issues in the development of forgiveness and other cultural dimensions of the apes' lives."In the video that is the subject of Pedersen's publication, Panbanisha was in the forest with Savage-Rumbaugh and an assistant, who had a dog in tow that Panbanisha didn't like.

Though Panbanisha and Savage-Rumbaugh moved from topic to topic in the conversation, Panbanisha repeatedly used the lexigrams to express her desire to be carried by the assistant, who was tending to the dog. Savage-Rumbaugh offered other resolutions, but Panbanisha remained firm. Ultimately, the ape prevailed and was carried from the forest by the assistant.

After applying conversational analysis tools, Pedersen asserted that language is more than the simple act of transferring information, but a conversational interaction between active participants. Language-competent bonobos use lexigrams, which are made up of arbitrary symbols that represent words, as the basis for conversations with humans.Pedersen said linguistic aspects of the conversation included turn taking, negotiation, pauses and repetition, and went far beyond information sharing made possible through the use of lexigrams symbols.

"She was using language to get at what she wanted," Pedersen said. "She is very, very clever and is fully capable of following the conversation the same way a human does. This tells me that Panbanisha's knowledge of language is far beyond understanding the words, to understanding how to use them in a conversation to get what she wants."

"One of the things Janni has affirmed, and affirmed in a way the lay person can understand, is the aspect of turn-taking. If there is anything universal in human language, it's turn of talk," Fields said. "The fact that Panbanisha has done this, and it's accessible even to an untrained reviewer, I think is an important aspect of her paper. She has looked at the whole social action, and the meaning. Ideational flow – going back and forth – is obvious."Originally, repetition was thought of something that happens normally in human language," he said. "Traditionally, repetition in ape communicative behaviors is assumed to be proof that they don't have language. It's a kind of dichotomy or unfairness."

Fields said Pedersen, who has a master's degree in philosophy from the University of Aarhus, Denmark, and is working toward a Ph.D. in ecology and evolutionary biology in ISU's Anthropology Department, "has been able to do something unique" that Chomsky, long regarded as the father of contemporary linguistics, was unable to do.Pedersen expects to complete her dissertation in ape language research, the second to focus on data collected with the world-famous bonobos at Great Ape Trust. The first was Pictorial Primates – A Search for Iconic Abilities in Great Apes, by cognitive scientist Tomas Persson from Sweden's Lund University. He argued that the bonobos at Great Ape Trust readily grasped the meaning of abstract symbols, such as those found on the lexigrams board, and, like humans, are able to interpret.

"The importance of Janni's Ph.D. can't be overstated," Fields said. "Hers will be the first Ph.D. produced in ape language since the research moved to Iowa."

The ape language research program moved from Georgia to Des Moines in 2005, and Great Ape Trust is the only place in the world where such research takes place. "Janni is an important part of the future, and she will help carry ape language research further," Fields said.

Adapted from materials provided by Great Ape Trust of Iowa.

http://www.sciencedaily.com/releases/2008/08/080828171701.htm

Landmark Study Opens Door To New Cancer, Aging Treatments

ScienceDaily (Sep. 2, 2008) — Researchers at The Wistar Institute have deciphered the structure of the active region of telomerase, an enzyme that plays a major role in the development of nearly all human cancers. The landmark achievement opens the door to the creation of new, broadly effective cancer drugs, as well as anti-aging therapies.

Researchers have attempted for more than a decade to find drugs that shut down telomerase—widely considered the No. 1 target for the development of new cancer treatments—but have been hampered in large part by a lack of knowledge of the enzyme's structure.

The findings, published online August 31 in Nature, should help researchers in their efforts to design effective telomerase inhibitors, says Emmanuel Skordalakes, Ph.D., assistant professor in Wistar's Gene Expression and Regulation Program, who led the study.

"Telomerase is an ideal target for chemotherapy because it is active in almost all human tumors, but inactive in most normal cells," Skordalakes says. "That means a drug that deactivates telomerase would likely work against all cancers, with few side effects."

The study elucidates the active region of telomerase and provides the first full-length view of the telomerase molecule's critical protein component. It reveals surprising details, at the atomic level, of the enzyme's configuration and how it works to replicate the ends of chromosomes—a process critical to both tumor development and the aging process.

Achieving immortality

In humans, telomerase adds multiple repeats of a short DNA sequence to the ends of chromosomes, known as telomeres, thus preventing damage and the loss of genetic information during cell division.

When telomerase is dormant, telomeres shorten each time a cell divides, leading eventually to genetic instability and cell death. By preserving chromosomes' integrity, telomerase allows cells to continue living and dividing. The enzyme is active in cells that multiply frequently, such as embryonic stem cells, but is switched off almost entirely in normal adult cells to prevent the dangers of runaway cell proliferation.

Cancer cells, however, often regain the ability to activate telomerase, which has been implicated in 90 percent of human tumors. The enzyme permits cells to replicate indefinitely and achieve the cellular "immortality" that is the hallmark of cancer. Deactivating telomerase would stop tumor growth.

In addition to its role in cancer, telomerase holds significant implications for the development of therapies to combat aging and other age-related diseases. Finding ways to activate telomerase under controlled conditions and allow some cells to begin dividing again could result in healthier, younger-looking tissue that lives longer.

An elusive enzyme

Telomerase is a complex structure made up of multiple protein domains and a stretch of RNA, which contains the template the enzyme uses to synthesize telomeres.

Last year, Skordalakes and his team solved the structure of a key segment of the molecule—the so-called TRBD domain, where RNA binding occurs. However, the complexity of telomerase has proved a

roadblock to determining the enzyme's overall architecture—a goal pursued by researchers worldwide for more than 15 years.

To perform the necessary studies, scientists first must gather large quantities of the enzyme in a specific conformation. Because the complex structure of telomerase most likely allows it to change configuration, that process has been challenging, Skordalakes says.

To find sufficient quantities of the enzyme for the study, Skordalakes and his team looked beyond commonly relied-on sources such as humans and yeast. By screening a wide variety of organisms, including protozoa and insects, they discovered that a gene from the red flour beetle could produce telomerase in copious amounts, and a stable form.

"That was really the breakthrough," Skordalakes says. "Once we found that the gene from this organism expressed the protein in the quantities we needed, we were able to move quickly."

The researchers used X-ray crystallography, a technique that analyzes the diffraction patterns of X-rays beamed at crystals of a molecule, to determine the three-dimensional structure of the enzyme's active region—the catalytic component called telomerase reverse transcriptase protein, or TERT.

The study revealed surprising features, including the fact that the molecule's three domains are organized into a doughnut shape, an unexpected configuration. Knowledge of the structure allowed the researchers to create a model of the enzyme's function.

"It's extremely exciting," Skordalakes says. "For the first time, we can see how telomerase assembles at the end of chromosomes to initiate telomere replication."

Looking ahead

Skordalakes plans to further study TERT and search for new telomerase inhibitors that could become cancer therapies. He also will look at modifying existing drugs. Previous attempts to target telomerase have fallen flat, but knowledge of the enzyme's structure will help researchers to determine the limitations of existing agents and make them more effective.

Skordalakes began his studies of telomerase when he joined The Wistar Institute in 2006 and established his first laboratory. "I've always been interested in understanding, on a molecular level, the function of protein nucleic acid assemblies and using that information in the treatment of human disease," he says. "Telomerase, because of its important role in cancer and aging, was an obvious target for me."

He says though the process was frustrating at times, his team was determined to solve the structure. "It required a lot of perseverance and effort, but we really wanted to do this," he says.

Wistar's Andrew J. Gillis and Anthony P. Schuller assisted with the study.

The research was supported in part by the Commonwealth Universal Research Enhancement Program of the Pennsylvania Department of Health and the Ellison Medical Foundation.

Adapted from materials provided by The Wistar Institute, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080831151339.htm

Prehistoric Funerary Precinct Excavated In Northern Israel: Grave Goods Include Phallic Figurines, Sea Shells

(1) Phallic figurine, (2) Small symbolic axe made with serpentine, (3) Shell pendants, (4) Engraved token (Credit: Photo by Professor Nigel Goring-Morris)

ScienceDaily (Sep. 2, 2008) — Hebrew University excavations in the north of Israel have revealed a prehistoric funerary precinct dating back to 6,750-8,500 BCE.

The precinct, a massive walled enclosure measuring 10 meters by at least 20 meters, was discovered at excavations being undertaken at Kfar HaHoresh. The Pre-Pottery Neolithic B site in the Nazareth hills of the lower Galilee is interpreted as having been a regional funerary and cult center for nearby lowland villages.

Prof. Nigel Goring-Morris of the Hebrew University's Institute of Archaeology, who is leading the excavations, says that the precinct is just one of the many finds discovered at the site this year – including remains of a fully-articulated, but tightly contracted 40 year old adult male.

Accompanying grave goods include a sickle blade and a sea shell, while a concentration of some 60 other shells were found nearby. The sea shells provide evidence for extensive exchange networks from the Mediterranean and Red Seas. Symbolic items include small plain or incised tokens. An entire herd of cattle was also found buried nearby.

While fertility symbols during this period are often associated with female imagery, at Kfar HaHoresh only phallic figurines have been found to date, including one placed as a foundation deposit in the wall of the precinct.

Exotic minerals found at the site include malachite from south of the Dead Sea, obsidian (natural volcanic glass) from central Anatolia, and a votive axe on serpentine from either Cyprus or northern Syria.

"Cultic artifacts, installations and their contextual associations attest to intensive ritual practices in the area," says Prof. Goring-Morris.

Burials at the site now total at least 65 individuals, and display an unusual demographic profile – with an emphasis on young adult males. Graves occur under or associated with lime-plaster surfaced L-shaped walled structures, and are varied in nature from single articulated burials through multiple secondary burials with up to 17 individuals. Bones in one had been intentionally re-arranged in what appears to be a depiction.

The Pre-Pottery Neolithic B, ca. 8,500-6,750 BCE, corresponds to the period when the first large village communities were established in the fertile regions of the Near East when a wide ranging cultural interaction sphere came into being throughout the Levant.

Adapted from materials provided by Hebrew University of Jerusalem, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080901085355.htm

Biophysical Method May Help To Recover Hearing

ScienceDaily (Sep. 2, 2008) — Scientists based in Switzerland and South Africa have created a biophysical methodology that may help to overcome hearing deficits, and potentially remedy even substantial hearing loss. The authors propose a method of retuning functioning regions of the ear to recognize frequencies originally associated with damaged areas.

Hearing loss is an increasingly important problem in societies of growing average age. The conventional hearing-aid and cochlear implant technology have only been partially successful in recreating the experience of the fully functioning ear.

A possible reason for the lack of success could be because the cochlea – the hearing sensor – must be fully embedded into the corto-cochlear feedback loop. While recent artificial cochleas have been developed that are extremely close to the performance of the biological one, the integration of artificial cochleas into this loop is an extremely difficult micro-surgical task.

In an attempt to circumvent this problem, the authors investigated the biophysics and bio-mechanics of the natural sensor. They have identified modifications that would enable the remapping of frequencies where the cochlea malfunctions to neighboring intact cochlear areas. This remapping is performed in such a way that no auditory information is lost and the tuning capabilities of the cochlea can be fully utilized.

Their findings indicate that biophysically realistic modifications could remedy even substantial hearing loss. Moreover, with a recently designed electronic cochlea at hand, the changes in the perception of hearing could be predicted.

The surgical procedures needed to establish the authors' suggested biophysical corrections have not yet been developed. Recently developed lasers could play a prominent role in these surgical procedures, similar to their role in correcting deficits for another important human sensor, the eye.

Journal reference:

1. Kern A, Heid C, Steeb W-H, Stoop N, Stoop R. **Biophysical Parameters Modification Could Overcome Essential Hearing Gaps**. *PLoS Comput Biol*, 4(8): e1000161 DOI: 10.1371/journal.pcbi.1000161

Adapted from materials provided by Public Library of Science, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080828220515.htm

Treatment Appears To Reduce Heart Attack Risk And Revascularisation In Stable Coronary Patients

ScienceDaily (Sep. 2, 2008) — Commenting after the results presentation, the Chairman of the BEAUTIFUL Executive Committee, Prof Kim Fox said 'Ivabradine was always known to relieve ischemia. With the BEAUTIFUL results, ivabradine is the first antianginal treatment shown to reduce myocardial infarction and revascularisation and to have a good tolerability profile even when used with other drugs. This is the gold standard for any antianginal, anti-ischemic drug'.

The BEAUTIFUL trial was initiated in December 2004, under the guidance of an independent Executive Committee with the first patient being enrolled in early 2005. 10917 CAD patients with LVD, were recruited in 781 centres in 33 countries across 4 continents. The mean heart rate in these patients was 71 bpm and half of the patients had a heart rate more than 70 bpm. The results of the BEAUTIFUL study have shown that these patients with heart rate > 70 bpm are more likely to die or suffer from another cardiovascular event. The increase in risk is 34% for cardiovascular death, 46% for myocardial infarction, 56% for heart failure and 38% for coronary revascularisation.

In the overall study population treatment with ivabradine did not result in a significant reduction of the primary composite end point (Cardiovascular death, admission to hospital for acute MI and admission to hospital for heart failure). However in patients with baseline heart rate more than 70 bpm, ivabradine significantly reduced the risk of hospitalisation for fatal and non-fatal myocardial infarction by 36% (p=0.001) and the risk of coronary revascularisation by 30% (p=0.016).

What is important to note is that most of these patients were already receiving the guidelines-recommended cardiovascular therapy: antiplatelet agents (94%), angiotensin-converting enzyme inhibitors or angiotensin receptor blockers (91%), ß-blockers (87%), as well as lipid-lowering agents (76%). Hence the results of BEAUTIFUL constitute a step further in the management of these coronary patients with heart rate above 70 bpm because, for the first time it has been shown that pure heart rate reduction with ivabradine further reduces coronary events even in patients receiving the current optimal cardiovascular therapy.

This study also confirms that ivabradine is safe and well tolerated and can be used with all routinely prescribed cardiovascular drugs. Commenting on the results the Chairman of the Steering Committee, Prof Roberto Ferrari said 'Often a lot of investigations are performed in coronary patients but a simple heart rate measurement is not done. BEAUTIFUL has reinforced the need to measure heart rate in all CAD patients and if the heart rate is more than 70 bpm to reduce it by using ivabradine on top of background therapy.'

BEAUTIFUL results with ivabradine can be explained by its well documented ability to relieve myocardial ischemia in patients with chronic stable angina.[1] New research has demonstrated that ivabradine improves endothelial dysfunction[2] and prevents the progression of atherosclerosis.

Despite all the advances, the World Health Organisation reports that till 2030 coronary artery disease will remain the leading healthcare problem worldwide[3]. Ivabradine would help to reduce this burden because as shown by the BEAUTIFUL study, ivabradine reduces the risk of myocardial infarction and revascularisation. 'Half of the CAD patients have a resting heart rate more than 70 bpm. These patients can now benefit from a treatment that will greatly reduce their chances of having another heart attack or needing further surgery, concluded Professor Kim Fox, the Chairman of the BEAUTIFUL Executive Committee.

References:

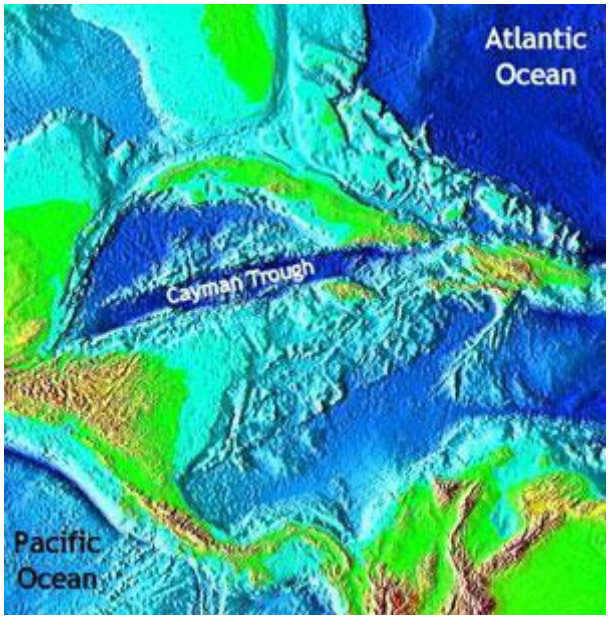
1. Tardif J-C, Ford I, Tendera M, et al. Eur Heart J. 2005;26:2529-2536.
2. Florian Custodis, MD*; Magnus Baumhäkel, et al Circulation 2008;117:2377-2387.
3. Projections of Global Mortality and Burden of Disease from 2002 to 2030 PLoS Med 3(11): e442. doi:10.1371/journal.pmed.0030442.

*Depending on the country, ivabradine is available as Procoralan®, Coralan®, Coraxan®, or Corlentor®

Adapted from materials provided by European Society of Cardiology (ESC).

http://www.sciencedaily.com/releases/2008/08/080831211806.htm

'Lost World' Beneath Caribbean To Be Explored



Scientists at the National Oceanography Centre, Southampton, are set to explore the world's deepest undersea volcanoes and find out what lives in a 'lost world' five kilometres beneath the Caribbean.

ScienceDaily (Sep. 1, 2008) — Scientists at the National Oceanography Centre, Southampton, are set to explore the world's deepest undersea volcanoes and find out what lives in a 'lost world' five kilometres beneath the Caribbean.

The team of researchers led by Dr Jon Copley has been awarded £462,000 by the Natural Environment Research Council to explore the Cayman Trough, which lies between Jamaica and the Cayman Islands. This rift in the Caribbean seafloor plunges to a depth of more than 5000 metres below sea level. It contains the world's deepest chain of undersea volcanoes, which have yet to be explored.

The researchers are planning two expeditions over the next three years using the UK's newest research ship, RRS James Cook. From the ship, the team will send the UK's remotely-operated vehicle Isis and a new British robot submarine called Autosub6000 into the abyss.

The team will look for new geological features and new species of marine life in the rift on the seafloor. Geologist Dr Bramley Murton will use a whale-friendly sonar system to map the undersea volcanoes in unprecedented detail to understand their formation. At the same time, oceanographer Dr Kate Stansfield will study the deep ocean currents in the Cayman Trough for the first time and geochemist Dr Doug Connelly will hunt for volcanic vents on the ocean floor. These volcanic vents are home to exotic deep-sea creatures that will be studied by marine biologists Dr Jon Copley and Professor Paul Tyler.

"The Cayman Trough may be a 'lost world' that will give us the missing piece in a global puzzle of deep-sea life," says Dr Copley, a lecturer with the University of Southampton's School of Ocean and Earth Science. Volcanic vents in the Atlantic are home to swarms of blind shrimp and beds of unusual mussels. But similar deep-sea vents in the eastern Pacific are inhabited by bizarre metre-long tubeworms. The researchers hope to find out whether creatures living in the Cayman Trough are related to those in the Pacific or the Atlantic – or completely different to both.

Before North and South America joined three million years ago, there was a deep water passage from the Pacific to the Atlantic. This means that the undersea volcanoes of the Cayman Trough could harbour a 'missing link' between deep-sea life in the two oceans. Finding out just what lives in the rift will help scientists understand patterns of marine life around the world.

"The deep ocean is the largest ecosystem on our planet, so we need to understand its patterns of life," says Dr Copley. "Deep-sea exploration has also given us new cancer treatments and better fibre-optic cables for the internet, both thanks to deep-sea creatures."

Working at depths of more than five kilometres will take the UK's deep-diving vehicles close to their limits. Isis is the UK's deepest diving remotely-operated vehicle (ROV) reaching depths of 6,500 metres. The team will control Isis from their research ship to film the ocean floor and collect samples with its robotic arms.

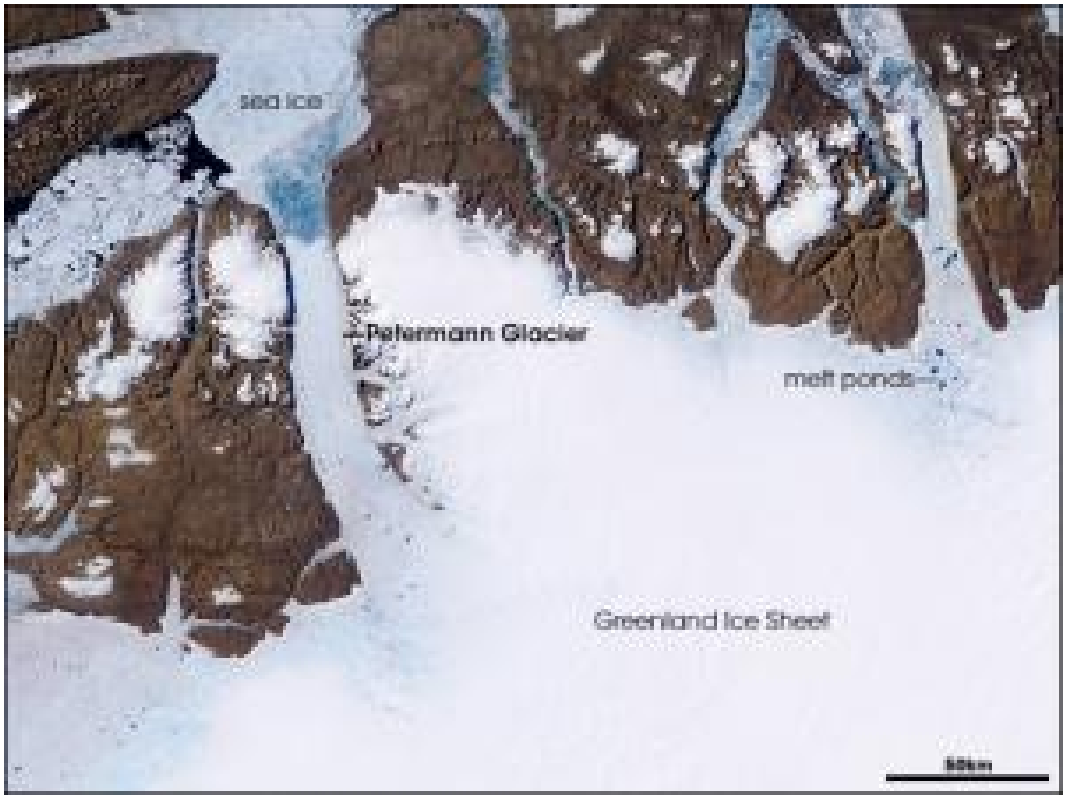
Autosub6000, a new unmanned undersea vehicle built in Southampton, can dive to 6000 metres deep. Autosub6000 is an autonomous underwater vehicle (AUV) – a robot submarine that can carry out missions on its own, without being remote-controlled. The team will launch Autosub6000 from their ship to survey the area and hunt for volcanic vents on the ocean floor.

"These undersea volcanoes lie within British seabed territory recognised by the United Nations," says Dr Copley. "We now have the technology to explore them." The public will be able to follow the progress of the expeditions through web pages updated from the ship. The team will also invite a school teacher to join them and share the scientific adventure with classrooms around the world.

Adapted from materials provided by National Oceanography Centre, Southampton.

http://www.sciencedaily.com/releases/2008/08/080830211000.htm

Faster Rise In Sea Level Predicted From Melting Greenland Ice Sheet, Based On Lessons From Ice Age



As the Greenland Ice Sheet melts, sea level rises. Sea level rise as a result of ice sheet melt can happen very rapidly. (Credit: NASA image by Jesse Allen and Robert Simmon)

ScienceDaily (Sep. 1, 2008) — If the lessons being learned by scientists about the demise of the last great North American ice sheet are correct, estimates of global sea level rise from a melting Greenland ice sheet may be seriously underestimated.

Writing in the journal Nature Geoscience, a team of researchers led by University of Wisconsin-Madison geologist Anders Carlson reports that sea level rise from greenhouse-induced warming of the Greenland ice sheet could be double or triple current estimates over the next century.

"We're not talking about something catastrophic, but we could see a much bigger response in terms of sea level from the Greenland ice sheet over the next 100 years than what is currently predicted," says Carlson, a UW-Madison professor of geology and geophysics. Carlson worked with an international team of researchers, including Allegra LeGrande from the NASA Center for Climate Systems at Columbia University, and colleagues at the Woods Hole Oceanographic Institution, the California Institute of Technology, University of British Columbia and University of New Hampshire.

Scientists have yet to agree on how much melting of the Greenland ice sheet — a terrestrial ice mass encompassing 1.7 million square kilometers — will contribute to changes in sea level. One reason, Carlson explains, is that in recorded history there is no precedent for the influence of climate change on a massive ice sheet.

"We've never seen an ice sheet disappear before, but here we have a record," says Carlson of the new study that combined a powerful computer model with marine and terrestrial records to provide a snapshot of how fast ice sheets can melt and raise sea level in a warmer world.

Carlson and his group were able to draw on the lessons of the disappearance of the Laurentide ice sheet, the last great ice mass to cover much of the northern hemisphere. The Laurentide ice sheet, which encompassed large parts of what are now Canada and the United States, began to melt about 10,000 years ago in response to increased solar radiation in the northern hemisphere due to a cyclic change in the orientation of the Earth's axis. It experienced two rapid pulses of melting — one 9,000 years ago and another 7,600 years ago — that caused global sea level to rise by more than half an inch per year.

Those pulses of melting, according to the new study, occurred when summer air temperatures were similar to what are predicted for Greenland by the end of this century, a finding the suggests estimates of global sea level rise due to a warming world climate may be seriously underestimated.

The most recent estimates of sea level rise due to melting of the Greenland ice sheet by the Intergovernmental Panel on Climate Change (IPCC) suggest a maximum sea level rise during the next 100 years of about 1 to 4 inches. That estimate, Carlson and his colleagues note, is based on limited data, mostly from the last decade, and contrasts sharply with results from computer models of future climate, casting doubt on current estimates of change in sea level due to melting ice sheets.

According to the new study, rising sea levels up to a third of an inch per year or 1 to 2 feet over the course of a century are possible.

Even slight rises in global sea level are problematic as a significant percentage of the world's human population — hundreds of millions of people — lives in areas that can be affected by rising seas.

"For planning purposes, we should see the IPCC projections as conservative," Carlson says. "We think this is a very low estimate of what the Greenland ice sheet will contribute to sea level."

The authors of the new Nature Geoscience report were able to document the retreat of the Laurentide ice sheet and its contributions to changes in sea level by measuring how long rocks once covered by ice have been exposed to cosmic radiation, estimates of ice retreat based on radiocarbon dates from organic material as well as changes in ocean salinity.

In addition to Carlson and LeGrande, co-authors of the study, which was funded primarily by the National Science Foundation, are Gavin A. Schmidt of Columbia University, Delia W. Oppo of the Woods Hole Oceanographic Institution, Rosemarie E. Came of the California Institute of Technology, Faron S. Anslow of the University of British Columbia, Joseph M. Licciardi of the University of New Hampshire and Elizabeth A. Obbink of UW-Madison.

Journal reference:

1. Anders Carlson et al. **Rapid early Holocene deglaciation of the Laurentide ice sheet**. *Nature Geoscience*, August 31, 2008

Adapted from materials provided by University of Wisconsin-Madison, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080831151346.htm

Crystals Improve Understanding Of Volcanic Eruption Triggers

Scientists have studied crystals from the Nea Kameni volcano in Santorini, Greece, to learn more about the timescale of volcanic eruptions. (Credit: Durham University)

ScienceDaily (Sep. 1, 2008) — Scientists have exploited crystals from lavas to unravel the records of volcanic eruptions.

The team, from Durham University and the University of Leeds, studied crystal formation from a volcano, in Santorini, in Greece, to calculate the timescale between the trigger of volcanic activity and the volcano's eruption.

They say the technique can be applied to other volcanoes – such as Vesuvius, near Naples, in Italy – and will help inform the decisions of civil defence agencies.

Worldwide, it is estimated that between 50 and 70 volcanoes erupt each year, but due to the long gaps between eruptions at most volcanoes it is hard to understand how any individual volcano behaves. This work allows scientists to better understand this behaviour.

The research, funded by the Natural Environment Research Council (NERC), was recently published in the journal Science.

The scientists looked at crystals from the 1925-28 eruption of Nea Kameni, in Santorini.

Lead author Dr Victoria Martin, of Durham University, showed that the crystal rims reacted with molten rock, or magma, as it moved into the volcano's shallow chamber prior to eruption. This process is thought to be associated with shallow level earthquake activity, as shown by modern volcano monitoring.

By studying the area between the crystal core and the rim the team then worked out how long the rims had existed – revealing how long the magma was in the shallow chamber before it erupted.

The crystals showed the 1925-28 eruption at Nea Kameni took place three to ten weeks after the magma entered the shallow system.

As magma movement typically causes seismic activity, if any future seismic or inflation activity at Nea Kameni can be linked to magma recharge of the volcano, the scientists predict an eruption could follow within a similar timescale.

They hope this method can be applied to other volcanoes, allowing the pre-eruption behaviour to be better understood - and understanding of volcanoes to be extended back further in time.

Co-author Dr Dan Morgan, from the School of Earth and Environment, at the University of Leeds, said: "We hope to develop these techniques further and apply them to more volcanoes worldwide.

"Potentially, these techniques could extend our knowledge of volcanic recharge considerably, as they can be applied to material erupted before volcanic monitoring was commonplace."

Professor Jon Davidson, Chair of Earth Sciences at Durham University, said: "We hope that what we find in the crystals in terms of timescales can be linked with phenomena such as earthquakes.

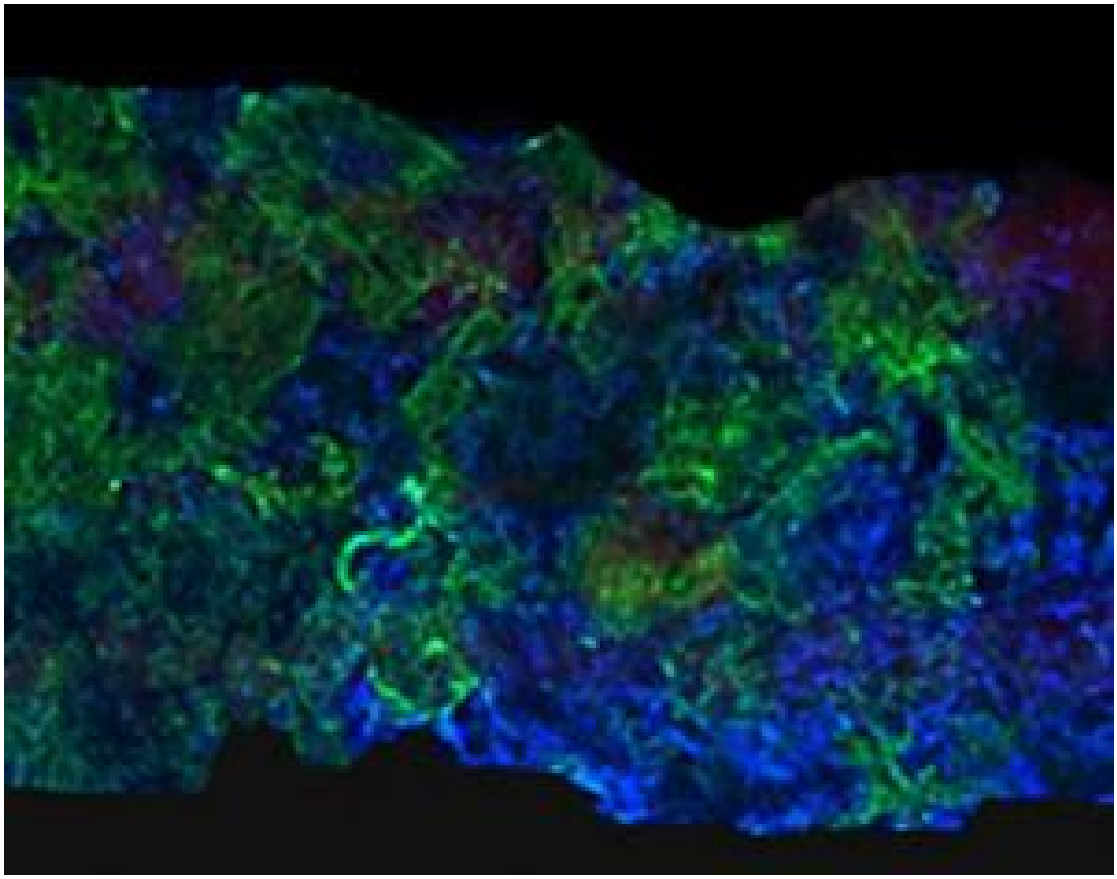
"If we can relate the timescales we measure to such events we may be able to say when we could expect a volcano to erupt.

"This is an exciting new method that will help us understand the timescales of fundamental volcanic processes driving eruptions."

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

http://www.sciencedaily.com/releases/2008/08/080828162558.htm

Bone That Blends Into Tendons Created By Engineers



A microscopic image of a 10 mm collagen scaffold containing a uniform distribution of skin cells (blue) seeded on top of a 3-D polylysine gradient (green). (Credit: Image courtesy of Georgia Institute of Technology)

ScienceDaily (Aug. 31, 2008) — Engineers at Georgia Tech have used skin cells to create artificial bones that mimic the ability of natural bone to blend into other tissues such as tendons or ligaments. The artificial bones display a gradual change from bone to softer tissue rather than the sudden shift of previously developed artificial tissue, providing better integration with the body and allowing them to handle weight more successfully.

"One of the biggest challenges in regenerative medicine is to have a graded continuous interface, because anatomically that's how the majority of tissues appear and there are studies that strongly suggest that the graded interface provides better integration and load transfer," said Andres Garcia, professor in the George W. Woodruff School of Mechanical Engineering at the Georgia Institute of Technology.

Garcia and former graduate student Jennifer Phillips, along with research technician Kellie Burns and their collaborators Joseph Le Doux and Robert Guldberg, were not only able to create artificial bone that melds into softer tissues, but were also able to implant the technology in vivo for several weeks.

They created the tissue by coating a three-dimensional polymer scaffold with a gene delivery vehicle that encodes a transcription factor known as Runx2. They generated a high concentration of Runx2 at one end of the scaffold and decreased that amount until they ended up with no transcription factor on the other end, resulting in a precisely controlled spatial gradient of Runx2. After that, they seeded skin fibroblasts

uniformly onto the scaffold. The skin cells on the parts of the scaffold containing a high concentration of Runx2 turned into bone, while the skin cells on the scaffold end with no Runx2 turned into soft tissue. The result is an artificial bone that gradually turns into soft tissue, such as tendons or ligaments.

If the technology is able to pass further testing, one application could be anterior cruciate ligament (ACL) surgery. Oftentimes, ACL surgery fails at the point where the ligament meets the bone. But if an artificial bone/ligament construct with these types of graded transitions were implanted, it might lead to more successful outcomes for patients.

"Every organ in our body is made up of complex, heterogeneous structures, so the ability to engineer tissues that more closely mimic these natural architectures is a critical challenge for the next wave of tissue engineering," said Phillips, who is now working at Emory University as a postdoctoral research fellow in developmental biology.

Now that they have been able to demonstrate that they can implant the tissue in vivo for several weeks, the team's next step is to show that the tissue can handle weight for an even longer period of time.

The research appears in the August 26, 2008, edition of the Proceedings of the National Academy of Sciences.

Adapted from materials provided by Georgia Institute of Technology.

http://www.sciencedaily.com/releases/2008/08/080829104945.htm

Flu Shot Does Not Reduce Risk Of Death, Research Shows

ScienceDaily (Aug. 31, 2008) — The widely-held perception that the influenza vaccination reduces overall mortality risk in the elderly does not withstand careful scrutiny, according to researchers in Alberta. The vaccine does confer protection against specific strains of influenza, but its overall benefit appears to have been exaggerated by a number of observational studies that found a very large reduction in all-cause mortality among elderly patients who had been vaccinated.

The study included more than 700 matched elderly subjects, half of whom had taken the vaccine and half of whom had not. After controlling for a wealth of variables that were largely not considered or simply not available in previous studies that reported the mortality benefit, the researchers concluded that any such benefit "if present at all, was very small and statistically non-significant and may simply be a healthy-user artifact that they were unable to identify."

"While such a reduction in all-cause mortality would have been impressive, these mortality benefits are likely implausible. Previous studies were likely measuring a benefit not directly attributable to the vaccine itself, but something specific to the individuals who were vaccinated—a healthy-user benefit or frailty bias," said Dean T. Eurich,Ph.D. clinical epidemiologist and assistant professor at the School of Public Health at the University of Alberta. "Over the last two decades in the United Sates, even while vaccination rates among the elderly have increased from 15 to 65 percent, there has been no commensurate decrease in hospital admissions or all-cause mortality. Further, only about 10 percent of winter-time deaths in the United States are attributable to influenza, thus to suggest that the vaccine can reduce 50 percent of deaths from all causes is implausible in our opinion."

Dr. Eurich and colleagues hypothesized that if the healthy-user effect was responsible for the mortality benefit associated with influenza vaccination seen in observational studies, there should also be a significant mortality benefit present during the "off-season".

To determine whether the observed mortality benefits were actually an effect of the flu vaccine, therefore, they analyzed clinical data from records of all six hospitals in the Capital Health region in Alberta. In total, they analyzed data from 704 patients 65 years of age and older who were admitted to the hospital for community-acquired pneumonia during non-flu season, half of whom had been vaccinated, and half of whom had not. Each vaccinated patient was matched to a non-vaccinated patient with similar demographics, medical conditions, functional status, smoking status and current prescription medications.

In examining in-hospital mortality, they found that 12 percent of the patients died overall, with a median length of stay of approximately eight days. While analysis with a model similar to that employed by past observational studies indeed showed that patients who were vaccinated were about half as likely to die as unvaccinated patients, a finding consistent with other studies, they found a striking difference after adjusting for detailed clinical information, such as the need for an advanced directive, pneumococcal immunizations, socioeconomic status, as well as sex, smoking, functional status and severity of disease. Controlling for those variables reduced the relative risk of death to a statistically non-significant 19 percent.

Further analyses that included more than 3,400 patients from the same cohort did not significantly alter the relative risk. The researchers concluded that there was a difficult to capture healthy-user effect among vaccinated patients.

"The healthy-user effect is seen in what doctors often refer to as their 'good' patients— patients who are well-informed about their health, who exercise regularly, do not smoke or have quit, drink only in moderation, watch what they eat, come in regularly for health maintenance visits and disease screenings, take their medications exactly as prescribed— and quite religiously get vaccinated each year so as to stay

healthy. Such attributes are almost impossible to capture in large scale studies using administrative databases," said principal investigator Sumit Majumdar, M.D., M.P.H., associate professor in the Faculty of Medicine & Dentistry at the University of Alberta.

The finding has broad implications:

- **For patients**: People with chronic diseases such as chronic respiratory diseases such as chronic obstructive pulmonary disease, immuno-compromised patients, healthcare workers, family members or friends who take care of elderly patients and others with greater exposure or susceptibility to the influenza virus should still be vaccinated. "But you also need to take care of yourself. Everyone can reduce their risk by taking simple precautions," says Dr. Majumdar. "Wash your hands, avoid sick kids and hospitals during flu season, consider antiviral agents for prophylaxis and tell your doctor as soon as you feel unwell because there is still a chance to decrease symptoms and prevent hospitalization if you get sick— because flu vaccine is not as effective as people have been thinking it is."
- **For vaccine developers**: Previously reported mortality reductions are clearly inflated and erroneous–this may have stifled efforts at developing newer and better vaccines especially for use in the elderly.
- **For policy makers**: Efforts directed at "improving quality of care" are better directed at where the evidence is, such as hand-washing, vaccinating children and vaccinating healthcare workers.

Finally, Dr. Majumder said, the findings are a reminder to researchers that "the healthy-user effect is everywhere you don't want it to be."

The results will appear in the first issue for September of the American Journal of Respiratory and Critical Care Medicine, a publication of the American Thoracic Society.

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

http://www.sciencedaily.com/releases/2008/08/080829091323.htm

Memory Trick Shows Brain Organization

ScienceDaily (Aug. 31, 2008) — A simple memory trick has helped show UC Davis researchers how an area of the brain called the perirhinal cortex can contribute to forming memories. The finding expands our understanding of how those brain areas that form memories are organized.

The brain puts together different items -- the what, who, where and when -- to form a complete memory. It was previously thought that this association process occurred entirely in a brain structure called the hippocampus, but this appears not to be the case, said Charan Ranganath, a professor at the UC Davis Center for Neuroscience and the Department of Psychology who led the research.

"We want to know how the brain areas that encode memory are organized," Ranganath said. "If your memory is affected by aging or Alzheimer's disease, is there a way to learn that can capitalize on the brain structures that may still be working well?"

Ranganath, along with graduate student Andrew Logan Haskins, Andrew Yonelinas, a UC Davis psychology professor and associate director of the Center for Mind and Brain, and Joel Quamme, a former UC Davis graduate student now at Princeton University, used functional magnetic resonance imaging (fMRI) to see which parts of the brain were active when volunteers memorized pairs of words such as "motor/bear" or "liver/tree." In this experiment, the volunteers either learned the pairs as separate words that could be fitted into a sentence, or as a new compound word, for example "motorbear," defined as a motorized stuffed toy.

"It's a sort of memory trick," Ranganath said.

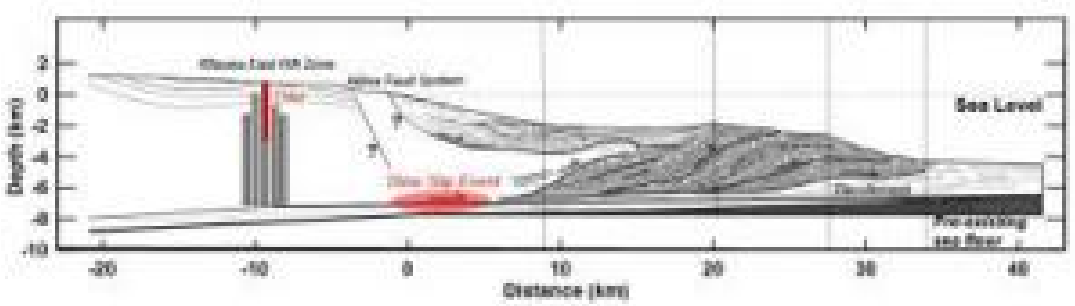
When volunteers memorized word pairs as a compound word, the perirhinal cortex lit up, and this activity predicted whether the volunteers would be able to successfully remember the pairs in the future. The results suggest that the perirhinal cortex probably can form simple associations, such as between the parts of a complex object. This information is probably passed up to the hippocampus, which may create more complex memories, such as the place and time a specific object was seen.

The research, which was funded by grants from the National Institutes of Health, is published Aug. 28 in the journal Neuron.

Adapted from materials provided by University of California - Davis.

http://www.sciencedaily.com/releases/2008/08/080828220519.htm

Magmatically Triggered Slow Earthquake Discovered At Kilauea Volcano, Hawaii



A schematic cross-section from north to south through Kilauea Volcano, showing the structure of the volcano and the mobile south flank. The June 17 dike intruded into the East Rift Zone and triggered the slow-slip event, that most likely occurred on the decollement fault between the volcano and the pre-existing sea floor, approx. 15 to 20 hours later. (Credit: James Foster, HIGP/SOEST)

ScienceDaily (Aug. 30, 2008) — From June 17-19th 2007, Kilauea experienced a new dike intrusion, where magma rapidly moved from a storage reservoir beneath the summit into the east rift zone and extended the rift zone by as much as 1 meter.

Researchers from the University of Hawaii at Manoa (UHM), Scripps Institution of Oceanography at UC San Diego, and the U.S. Geological Survey (USGS) Hawaiian Volcano Observatory have now discovered that the 2007 dike intrusion was not the only action going on: the dike also triggered a "slow earthquake" on Kilauea's south flank, demonstrating how magmatism and earthquake faulting at Kilauea can be tightly connected.

Slow earthquakes are a special type of earthquake where fault rupture occurs too slowly (over periods of days to months) to produce any felt shaking. Slow earthquakes of magnitude 5.5-5.7 have been previously found to periodically occur on the flanks of Kilauea, and have been identified by ground motion data on Global Positioning System (GPS) stations. A general understanding of slow earthquake initiation, however, is still unresolved.

This new study is the first observation of slow earthquake that was triggered by a dike intrusion. A team lead by Associate Researcher Ben Brooks of the School of Ocean and Earth Science and Technology (SOEST) at UHM used a combination of satellite and GPS data to demonstrate that the 2007 slow earthquake began about 15-20 hours after the start of the dike intrusion, and that the slow earthquake was accompanied by elevated rates of small magnitude microearthquakes, a pattern identical to what has been seen from past slow earthquakes.

The authors also performed stress modeling to demonstrate how the processes associated with the volcanism at Kilauea contributes to the existence of the observed slow earthquakes. The results suggest that both extrinsic (intrusion-triggering on short time scales) and intrinsic (secular deformation on long time scales) processes produce slow earthquakes at Kilauea.

"Because of the large deformation signals from the dike intrusion, we needed to do some detailed detective work to prove the existence of this slow earthquake." says Brooks, an associate researcher in the Hawaii Institute for Geophysics and Planetology (HIGP) at UHM. "We used state-of-the-art InSAR satellite data to constrain the dike source and that allowed us to demonstrate the existence of the slow earthquake motions recorded by the GPS stations on Kilauea's flank."

To determine the presence of this slow earthquake, a multitude of measuring tools were required. "A dike intrusion could be seen with the seismic monitoring network, the tiltmeters and the GPS network, but these slow earthquakes can only be seen with the GPS network," says James Foster, an assistant researcher with HIGP, and a co-author in the study.

"These slow earthquakes are an interesting phenomenon that has only been studied within the last decade and we're still trying to figure out how they fall into the bigger picture of earthquakes, says Cecily Wolfe, also an associate professor in HIGP and another co-author. "They're definitely a part of the earthquakes cycle, and trying to understand how they relate to other earthquakes and how they may be generated and triggered will give us greater insights into how predicable earthquakes are."

Other researchers involved in the study are David Sandwell and David Myer of Scripps Institution of Oceanography at UC San Diego, and Paul Okubo and Michael Poland of the USGS Hawaiian Volcano Observatory.

This research was supported by the National Science Foundation and the USGS.

Journal reference:

1. Benjamin Brooks, James Foster, David Sandwell, Cecily Wolfe, Paul Okubo, Michael Poland, David Myer. **Magmatically Triggered Slow Slip at Kilauea Volcano, Hawaii**. *Science*, 28 August 2008 DOI: 10.1126/science.1159007

Adapted from materials provided by University of Hawaii at Manoa, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/08/080829104947.htm

'Rare' mammoth skull discovered

By Paul Rincon
Science reporter, BBC News

The "extremely rare" fossilised skull of a steppe mammoth has been unearthed in southern France.

The discovery in the Auvergne region could shed much needed light on the evolution of these mighty beasts.

Many isolated teeth of steppe mammoth have been found, but only a handful of skeletons exist; and in these surviving specimens, the skull is rarely intact.

Palaeontologists Frederic Lacombat and Dick Mol describe this skull specimen as being well preserved.

It belongs to a male steppe mammoth (*Mammuthus trogontherii*) that stood about 3.7m (12ft) tall and lived about 400,000 years ago, during Middle Pleistocene times.

> **We need to find what I call the 'missing link' in mammoth evolution**
> Dick Mol, Natural History Museum, Rotterdam

The animal was about 35 years of age when it died, the researchers estimate.

The steppe mammoth is of vital importance for understanding mammoth evolution.

It represents the transitional phase between an ancient species known as the southern mammoth and the more recent woolly mammoth.

But comparatively little is known about this intermediate stage.

"This specimen is of extreme importance because we don't know that much about the Middle Pleistocene," Mr Mol, from the Museum of Natural History in Rotterdam, the Netherlands, told BBC News.

MAMMOTH EVOLUTION
Southern mammoth (*Mammuthus meridionalis*) - lived from 2.6 million years ago to 800,000 years ago, during the Early Pleistocene
Steppe mammoth (*Mammuthus trogontherii*) - lived from 800,000 years ago to 300,000 years ago, during the Middle Pleistocene
Woolly mammoth (*Mammuthus primigenius*) - lived from 300,000 years ago to 4,000 years ago, during the Late Pleistocene and Holocene

"Lots of the sediments have been eroded and not so many localities are known where we can find fossils.

He added: "We cannot keep saying that we have the [southern mammoth] at the beginning of the Pleistocene, then we have something which we are not sure about, and finally we have the woolly mammoth [at the end of the Pleistocene].

"We need to find what I call the 'missing link' in mammoth evolution."

The southern mammoth appears to have lived in a savannah environment, and was probably a "browser", feeding on trees and shrubs.

However, the molar teeth of steppe mammoth and woolly mammoth show that these animals were adapted to grazing.

This is thought to represent an adaptation to climate change; as conditions got colder and drier over the Pleistocene period, the savannah disappeared, making way for grassy steppe. Mammoth had to adapt their diets accordingly.

"If they have a complete skull then that would be very valuable," Dr Adrian Lister, a mammoth expert from London's Natural History Museum and University College London, told BBC News.

Evolutionary debate

One of the best preserved examples of a steppe mammoth was excavated in the cliffs of West Runton in Norfolk, UK.

"With West Runton, we have a fabulous skeleton. It has its jaws and teeth, but the whole top part of the skull has gone. And that is usually the case with these fossil elephants," explained Dr Lister.

According to a theory developed by Dr Lister with other researchers, the southern mammoth was once widespread in Eurasia. It then evolved into a cold-adapted form - the steppe mammoth - in eastern Asia, where the climate has been chilly for the last two million years.

However, when Ice Age conditions took hold across the northern hemisphere, the steppe mammoth spread outwards, replacing its predecessor in Europe and Asia.

A similar process may have later led to the emergence of the woolly mammoth. According to Dr Lister, it evolved from the steppe mammoth in north-east Siberia, then expanded its range during an Ice Age, eventually displacing its forerunner the steppe mammoth.

However, Dick Mol takes a different view. He thinks evolutionary changes in the mammoth lineage take place too quickly under this model.

Instead, he favours a model in which Europe is the centre for mammoth evolution.

Two molar teeth belonging to the newly discovered specimen were found in 1986, during the construction of a water pipeline.

Frederic Lacombat was able to trace the site of this discovery and subsequent excavations revealed the skull from which they had come.

The team plans to lift the skull out of the ground and transport it on a truck to Crozatier Museum in nearby Le Puy-en-Velay.

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Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7592317.stm

Published: 2008/09/02 00:47:43 GMT

Mums-to-be confused over advice

There is widespread confusion among mums-to-be about pregnancy health, largely compounded by conflicting information, a survey reveals.

A third of the 1,303 women polled by Tommy's and Johnson's Baby were confused by what you can eat and which drugs are safe to take in pregnancy.

Others did not know whether it was safe to have sex, drink alcohol, dye their hair or get on a plane when pregnant.

Nearly half said they had received conflicting pregnancy advice.

Sharon Simms, a midwife and spokeswoman for Tommy's, said: "Research is revealing new findings all the time about the best ways for women to keep their babies healthy, so it is vital that mums-to-be get the most up-to-date information from both their midwife and other credible sources.

> **It is vital that mums-to-be get the most up to date information from both their midwife and other credible sources**
> Sharon Simms, a midwife and spokeswoman for Tommy's

"Whilst it is reassuring for women to speak to family and friends about their pregnancy, times have moved on. What was considered right for our parents' generation may no longer still be the case."

Rosie Dodds of the National Childbirth Trust said: "Women are bombarded with information in early pregnancy and it can be difficult to make sense of how important it is to you personally.

"Ideally, midwives are the key source of information in pregnancy but they are often short of time.

"There is a lot of information available online, but it is important to use credible sources."

Things pregnant women are confused about

What is safe to eat?
How much alcohol can you drink?
What drugs are safe to take?
Is it OK to have sex?
Is it OK to travel by plane?
Is it safe to dye your hair?

Tommy's is launching its Let's Talk Baby campaign which aims to empower pregnant women by bringing the realities of pregnancy into the open, and making impartial, expert pregnancy health information available to all.

The survey also revealed that one in three women had experienced unexpected physical changes, with as many as one in six feeling too embarrassed to share them with anyone.

These included bladder problems, constipation and increased body hair.

Although embarrassing and unwanted, such problems are common in pregnancy, will not harm the baby and often can be treated or managed.

Current advice

Embarrassing changes
Memory loss
Mood swings
Acne
Bladder weakness
Constipation and flatulence
Breast leakage
Increased body hair or hair loss
Sweating and body odour

The government says pregnant women or women trying to conceive should avoid drinking alcohol.

If they do choose to drink, to protect the baby they should not drink more than one to two units of alcohol once or twice a week and should not get drunk.

Experts say there is no real evidence that dying your hair can damage your baby. However, it is a good idea to minimise any contact with chemicals during early pregnancy, and therefore best avoid colouring your hair in the first 12 weeks.

Some airlines will let you fly up to 36 weeks if you have a doctor's letter to say that you are fit enough.

Sex is safe during pregnancy unless your doctor advises you against it because of a medical problem.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7592176.stm

Published: 2008/09/01 23:05:10 GMT

New brain cells are essential for learning

- 18:01 31 August 2008
- NewScientist.com news service

Rachel Nowak

Far from being a completed masterpiece, some parts of the brain are works-in-progress, continuously churning out new cells. Now we may know why the brain goes to all that trouble. In mice at least, it appears that fresh brain cells are key to learning and memory.

By watching how genetically altered mice tried to learn and memorise the location of a hiding hole without the help of new brain cells, a team led by Ryoichiro Kageyama of Kyoto University in Japan has shown that new brain cells are essential for learning and memory.

"It was always unclear whether neurogenesis in the adult was essential for normal brain function, or whether it was an innocent bystander. This shows that it's essential," says Rodney Rietze of the Queensland Brain Institute in Brisbane, Australia.

Kageyama's team created a strain of mice engineered so that when they were given a drug, newly made brain cells in the hippocampus produced proteins that killed the cells. The hippocampus is essential for learning and memory.

The team then looked at how well the mice learned to find a hiding hole, a standard test of learning and memory. "Usually a mouse remembers the hole after one or two days' training, and will still remember it a week later. These mice took five or six days to remember, and then totally forget it one week later," says Kageyama.

Smelly test

In another test, the researchers cut the supply of new cells to the animals' olfactory bulb, the region of the brain that perceives odour. Although the olfactory bulb shrank, the ability of the mice to discriminate between very similar smells was not affected, nor was their ability to remember the smells four months later. That suggests new cells might not be as important for smell memory as for spatial memory.

But Kageyama says that alternative explanations are that the mice's abilities may worsen as their olfactory bulbs become more damaged over time, or that new cells in the olfactory bulbs are used for specific types of smell memories not tested in the experiment. For instance female mice remember the pheromonal scent of their mates, and will abort their foetuses if they smell a strange male.

The team also created mice in which new nerve cells glow green in order to test drugs that could be used to stimulate neurogenesis in people, in whom a reduced ability to produce new brain cells may account for age-related memory loss.

"Brain circuitry is not set in stone," says Pankaj Sah of the Queensland Brain Institute in Brisbane. "It's malleable and growing even in an adult. We've suspected it for a long while, but this is the first evidence that these new cells are doing something functional in learning and memory,"

Journal reference: *Nature Neuroscience* (DOI: 10.1038/nn.2185)

The Human Brain *- With one hundred billion nerve cells, the complexity is mind-boggling. Learn more in our cutting edge special report.*

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- http://www.qbi.uq.edu.au//index.html?page=13987
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http://www.newscientist.com/channel/being-human/dn14630-new-brain-cells-are-essential-for-learning.html?feedId=online-news_rss20

Adverts are the enemy of art. We should be keeping them out - not sneaking them in

- Mark Ravenhill
- The Guardian,
- Monday September 1 2008
- Article history

You know you've enjoyed a film when you stay to read every name on the closing credits. And I loved Shane Meadows' Somers Town. So I sat smiling through the credits. I wish I hadn't. A final credit states simply: "Copyright Eurostar". I had read in advance that the film - which culminates in a blissful cross-channel train journey - was entirely funded by Eurostar. But this credit felt like a slap in the face. It was like going on a perfect date, only to discover that the other guy was there because his tax bill was coming up, and he needed a few receipts to give to his accountant. I felt used, I felt cheap, I felt like a business expense.

Maybe I shouldn't have reacted so strongly. After all, nearly every film has been owned and distributed by a large entertainment corporation, and half the TV I watch exists largely to deliver me up to a group of advertisers as a pre-packaged demographic. But I'm so used to these credits and ads that I hardly notice them. I often read that a summer blockbuster is riddled with product placement, but I never notice the watches, mobile phones and energy drinks that are being placed in the hands of the hero, often at a cost of millions to manufacturers. I ought to be more worried about these subliminal placements than the overt Eurostar puff, but it was the bald honesty of the Somers Town credit that upset me.

In the past decade, as artists and as cultural consumers, we've been encouraged to be more relaxed about the relationship between art and commerce. In a previous era, Warhol's work ironically questioned culture's claim to unique purity: in a mechanical and media age, art could no longer see itself as being outside the material world. But Warhol had a complex mixture of fascination and disgust with both consumerism and celebrity. In contrast, a contemporary artist such as Sam Taylor-Wood seems to have a vision indistinguishable from the sensibilities of the celebrity magazine and the advertising agency. In effect, the artist becomes just another peddler of lifestyles.

I don't think artists should live outside their time. We live in a society of products. We need an art that acknowledges and uses this: I'm not interested in art that is the equivalent of a Blue Peter model-making demonstration, where washing-up liquid bottles and cereal packets have the labels carefully obscured by brown paper.

US writer Bret Easton Ellis's narratives are saturated with products. Whole paragraphs of his are lists of brand names. But this builds up to create a moral vision: his characters' souls have died precisely because of this whirlpool of consumer items. The opening series of Sex and the City seemed to have a similar sense of the silliness of shopping and branding. But by the time Carrie and the girls reached their final season, with the show's star now promoting fragrance and fashion in the real world, the programme itself seemed to fall in love with products. This - and not Carrie's on-off relationship with Mr Big - was the true romantic story arc of Sex and the City: character and consumer became one.

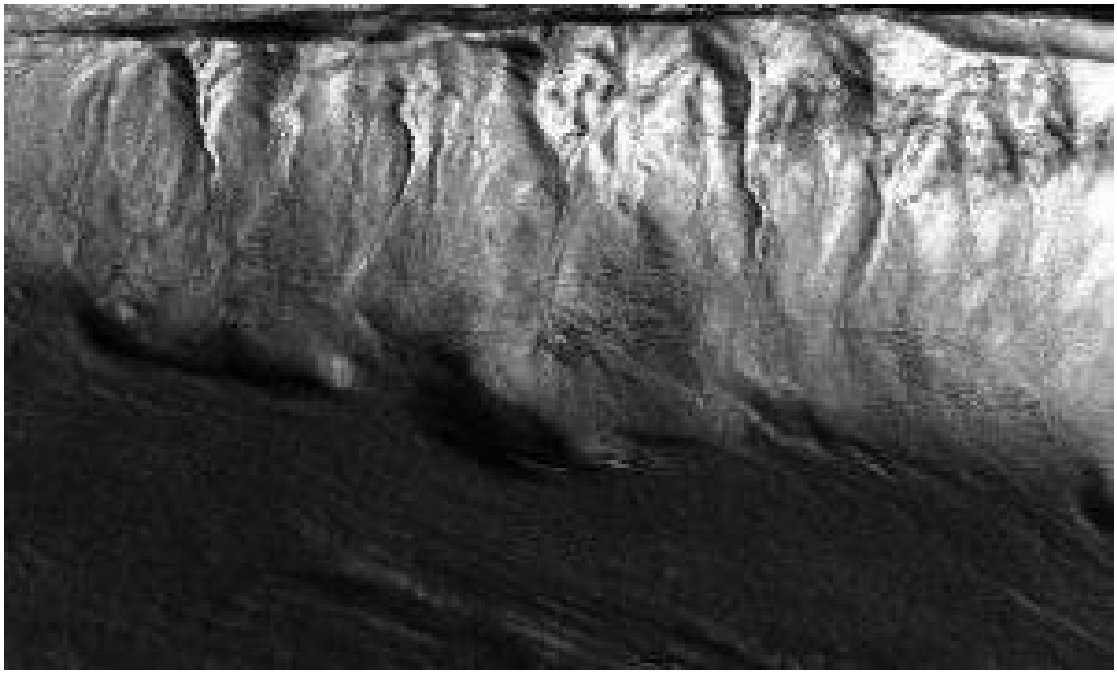
Artists have always had to strike up a relationship with a sponsor. The church, the nobility, the state, big business - all have held the purse strings. Maybe the dream of being free as an artist is an impossible ideal, possibly even undesirable. But we have to battle to define the line between art and product. Recently, I became excited about the possibilities of creating a drama serial on the internet: thrice-daily instalments in a fresh medium. But I quickly discovered that the only source of funding lay in business. There are no ad breaks in internet drama. If money is forthcoming, the only option, at the moment, is for

the drama and the advert to become one. Current internet dramas are funded by - and feature characters prominently using - a particular type of mobile phone or sanitary towel. The drama's hero, driving the action of the scene and determining the final cut, becomes the product, not the character.

If this is the only choice available, then I figure, as a dramatist, it's best to walk away. Yes, I want to tell stories about our world of dizzy consumerism. But the advert is the enemy of art. And we have to keep fighting the battle.

http://www.guardian.co.uk/film/2008/sep/01/advertising?gusrc=http://www.artsjournal.com/newsletters/rss&feed=artanddesign

Antarctic Research Helps Shed Light On Climate Change On Mars



This oblique areal view of gullies, fans, lobate depressions, and viscous-flow along the walls and floor of Newton Crater comes from a high-resolution image from the CTX camera on the Mars Reconnaissance Orbiter combined with Martian topography data. (Credit: National Academy of Sciences, PNAS (Copyright 2008))

ScienceDaily (Aug. 30, 2008) — Researchers examining images of gullies on the flanks of craters on Mars say they formed as recently as a few hundred thousand years ago and in sites once occupied by glaciers. The features are eerily reminiscent of gullies formed in Antarctica's mars-like McMurdo Dry Valleys.

The parallels between the Martian gullies and those in Antarctica's McMurdo Dry Valleys were made using the latest high-resolution images and technology from satellites orbiting Mars to observe key details of their geological setting.

On Mars, the gullies appear to originate from cirque-like features high on pole-facing crater-interior walls, especially those within the Newton crater, 40°S, examined for the study. In addition to the cirque-like features, the evidence cited for former glaciation includes bowl-shaped depressions fringed by lobate, viscous-flow deposits that extend well out onto the crater floor.

"These bowl-shaped depressions reflect the former location of relatively pure glacier ice," noted David R. Marchant, an Associate Professor of Earth Sciences at Boston University, and co-author of the study published in the August 25th issue of the Proceedings of the National Academy of Sciences with James W. Head of Brown University, lead author, and Mikhail A. Kreslavsky of the University of California, Santa Cruz.

As conditions on Mars shifted toward reduced snowfall at this site, clean ice on the crater wall sublimated, leaving a hole, whereas ice containing appreciable rock-fall debris out on the crater floor became covered with thin rubble, preventing complete volatile loss.

But even as the last glaciers vanished, minor snow likely continued to fall. "This late-stage snow could accumulate in depressions on the crater wall and, in favorable microclimate settings, melt to produce the observed gullies and fans," said Marchant.

"The results", he said, "are exciting because they establish a spatial link between recent gullies and accumulation of glacier ice, strengthening the case for surface melt water flow in the formation of gullies on Mars".

Other candidate processes include dry debris flows and melting of shallow ground ice, but the sequence of events demonstrating recent snowfall in Newton Crater make surface melting of snow banks an appealing choice. In fact, both Marchant and Head have observed similar processes at work in the development of modern gullies within some of the coldest and driest regions of Antarctica.

The authors conclude that changes in the rate and accumulation of snow in Newton Crater are likely related to changes in the inclination of Mars' spin access, or obliquity.

At obliquities even greater than those postulated for glaciation of Newton Crater, the same authors and colleagues postulated even larger-scale mountain glaciation near the equator, on and extending out from the Tharsis volcanoes.

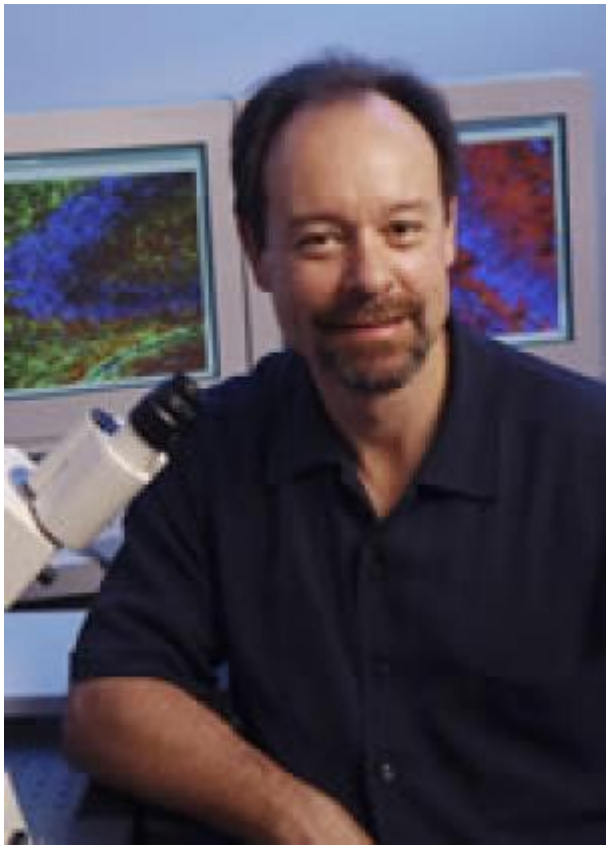
The evidence suggests a link between obliquity, mid-latitude glaciation, and gully formation on Mars. Rather than being a dead planet, the new data are consistent with dynamic climate change on Mars, and with episodes of alpine glaciation and melt water formation in the recent past that rival modern alpine glaciation and gully formation in the coldest and driest mountains of Antarctica.

NASA and the National Science Foundation funded the research.

Adapted from materials provided by Boston University.

http://www.sciencedaily.com/releases/2008/08/080828171703.htm

Antidepressants Need New Nerve Cells To Be Effective, Researchers Find



Dr. Luis Parada. (Credit: Image courtesy of UT Southwestern Medical Center)

ScienceDaily (Aug. 30, 2008) — Researchers at UT Southwestern Medical Center have discovered in mice that the brain must create new nerve cells for either exercise or antidepressants to reduce depression-like behavior.

In addition, the researchers found that antidepressants and exercise use the same biochemical pathway to exert their effects.

These results might help explain some unknown mechanisms of antidepressants and provide a new direction for developing drugs to treat depression, said Dr. Luis Parada, chairman of developmental biology and senior author of a study in the Aug. 14 issue of the journal Neuron.

In animals, it was already known that long-term treatment with antidepressants causes new nerve cells to be generated in a part of the brain called the dentate gyrus. Exercise, which can also relieve the symptoms of depression, stimulates the generation of new nerve cells in the same area.

"We would never claim that what we study in mice directly relates to how antidepressants work in humans, but there are interesting features in parallel," Dr. Parada said. "The study unifies different observations that point to the brain's dentate gyrus region and to creation of nerve cells as being important in depression."

Antidepressants act very quickly to increase levels of natural compounds, called neurotransmitters, which nerve cells use to communicate. It takes several weeks to several months, however, for the patients who respond to such treatments to feel less depressed. Dr. Parada said this implies that some other long-term mechanism is also at work.

The current study was designed to test several phenomena that have long been observed in animal studies but have not been studied together to see if they are linked, Dr. Parada said.

The researchers focused on a molecule called TrkB, or Track-B, which is found on the surface of nerve cells and responds to several growth factors to cause new nerves to grow in the dentate gyrus.

They genetically engineered mice to lack TrkB specifically in the stem cells that give rise to new neurons, then gave them antidepressants for several weeks or allowed them to run on wheels. When the mice were tested for depressive behavior, the tests revealed that neither the antidepressants nor the exercise had helped them, and the animals also had not grown new nerve cells in the dentate gyrus.

"At least in mice, this result directly links antidepressants and voluntary exercise with TrkB-mediated creation of nerve cells," Dr. Parada said.

The results also showed that antidepressants required TrkB to stimulate the growth of new nerve cells.

Matching the timeframe for medicated patients to feel less depressed, it takes several weeks for new nerve cells to grow, Dr. Parada said. This parallel effect, he said, may mean that antidepressants need to stimulate growth of new cells in the dentate gyrus in order to achieve their full effect.

"We can get biochemical, physiological, behavioral and anatomical results in animal models," Dr. Parada said. "These all resonate with the human condition, so perhaps you have a physiological relevancy.

"There could be a way to stimulate growth of nerve cells to fight depression, for example."

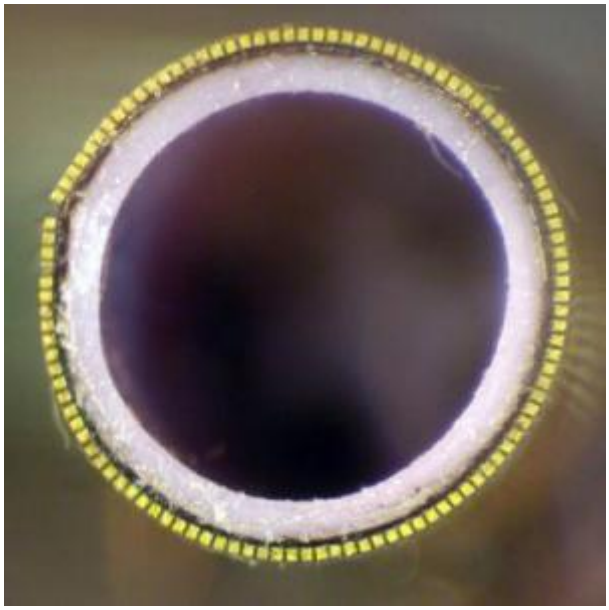
Other UT Southwestern researchers involved in the study were lead author Yun Li, graduate student in developmental biology; Bryan Luikart, former graduate student in developmental biology; Dr. Shari Birnbaum, assistant professor of psychiatry; Jian Chen, student research assistant in developmental biology; Dr. Chang-Hyuk Kwon, instructor of developmental biology; Dr. Steven Kernie, associate professor of pediatrics; and Dr. Rhonda Bassel-Duby, associate professor of molecular biology.

The work was supported by the National Institute of Neurological Disorders and Stroke.

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

http://www.sciencedaily.com/releases/2008/08/080828084056.htm

Tiny 3-D Ultrasound Probe Guides Catheter Procedures



3-D Transducer. (Credit: Ned Light, Duke University)

ScienceDaily (Aug. 30, 2008) — An ultrasound probe small enough to ride along at the tip of a catheter can provide physicians with clearer real-time images of soft tissue without the risks associated with conventional x-ray catheter guidance.

Duke University biomedical engineers designed and fabricated the novel ultrasound probe which is powerful enough to provide detailed, 3-D images. The new device works like an insect's compound eye, blending images from 108 miniature transducers working together.

Catheter-based procedures involve snaking instruments through blood vessels to perform various tasks, such as clearing arteries or placing stents, usually with the guidance of x-ray images.

In a series of proof-of-principle experiments in a water tank using simulated vessels, the engineers used the new ultrasound probe to guide two specific procedures: the placement of a filter within a vessel and the placement of a synthetic "patch" for aortic aneurysms. The scientists plan to begin tests of the new system in animals within the year.

"There are no technological barriers left to be overcome," said Stephen W. Smith, director of the Duke University Ultrasound Transducer Group and senior member of the research team that published the results of its latest experiments online in the journal IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control. It is the cover article for the September issue.

"While we have shown that the new probe can work for two types of procedures, we believe that results will be more far-reaching," Smith said. "There are many catheter-based interventional procedures where 3-D ultrasound guidance could be used, including heart valve replacements and placement of coils in the brain to prevent stroke. Wherever a catheter can go, the probe can go."

Currently, when maneuvering a catheter through a vessel, physicians rely on x-ray images taken from outside the body and displayed on a monitor to manipulate their instruments. Often, a contrast agent is injected into the bloodstream to highlight the vessel.

"While the images obtained this way are good, some patients experience adverse reactions to the contrast agent," said research engineer Edward Light, first author of the paper and designer of the new probe. "Also, the images gained this way are fleeting. The 3-D ultrasound guidance does not use x-ray radiation or contrast agents, and the images are real-time and continuous."

Another benefit is portability, which is an important issue for patients who are too sick to be transported, since x-rays need to be taken in specially equipped rooms, Light said. The 3-D ultrasound machine is on wheels and can be moved easily to a patient's room.

Advances in ultrasound technology have made these latest experiments possible, the researchers said, by generating detailed, 3-D moving images in real-time. The Duke laboratory has a long track record of modifying traditional 2-D ultrasound – like that used to image babies in utero – into the more advanced 3-D scans. After inventing the technique in 1991, the team also has shown its utility in developing specialized catheters and endoscopes for real-time imaging of blood vessels in the heart and brain.

After testing many iterations of the design of the probe, also known as a transducer, the engineers came up with a novel approach – lining the front rim of the catheter sheath with 108 miniature transducers.

"These tiny transducers work together to create one large transducer, working much like the compound eyes of insects," Light explained.

In the first experiment, the new probe successfully guided the placement of a filter in a simulated vena cava, the large vein that carries deoxygenated blood from the lower extremities to the back to heart. Patients with clots in their legs – known as deep vein thrombosis – who cannot get clot-busting drugs often receive these filters to prevent the clots dislodging and traveling to the heart and lungs.

The second experiment involved the placement of abdominal aorta aneurysm stent grafts, which are large synthetic "tubes" used to patch weakened areas of the aorta that are at risk of bursting.

"I believe we have shown that 3-D ultrasound clearly works in a wide variety of interventional procedures," Smith said. "We envision a time in the not-too-distant future when this technology becomes standard equipment in various catheter kits."

The research in Smith's lab is supported by the National Institutes of Health.

Adapted from materials provided by Duke University.

http://www.sciencedaily.com/releases/2008/08/080828093349.htm

Scientists Discover Why Flies Are So Hard To Swat

Researchers have determined the secret to a fly's evasive maneuvering that it uses to avoid being swatted. (Credit: iStockphoto/Michael Gatewood)

ScienceDaily (Aug. 29, 2008) — Over the past two decades, Michael Dickinson has been interviewed by reporters hundreds of times about his research on the biomechanics of insect flight. One question from the press has always dogged him: Why are flies so hard to swat?

"Now I can finally answer," says Dickinson, the Esther M. and Abe M. Zarem Professor of Bioengineering at the California Institute of Technology (Caltech).

Using high-resolution, high-speed digital imaging of fruit flies (Drosophila melanogaster) faced with a looming swatter, Dickinson and graduate student Gwyneth Card have determined the secret to a fly's evasive maneuvering. Long before the fly leaps, its tiny brain calculates the location of the impending threat, comes up with an escape plan, and places its legs in an optimal position to hop out of the way in the opposite direction. All of this action takes place within about 100 milliseconds after the fly first spots the swatter.

"This illustrates how rapidly the fly's brain can process sensory information into an appropriate motor response," Dickinson says.

For example, the videos showed that if the descending swatter--actually, a 14-centimeter-diameter black disk, dropping at a 50-degree angle toward a fly standing at the center of a small platform--comes from in front of the fly, the fly moves its middle legs forward and leans back, then raises and extends its legs to push off backward. When the threat comes from the back, however, the fly (which has a nearly 360-degree field of view and can see behind itself) moves its middle legs a tiny bit backwards. With a threat from the side, the fly keeps its middle legs stationary, but leans its whole body in the opposite direction before it jumps.

"We also found that when the fly makes planning movements prior to take-off, it takes into account its body position at the time it first sees the threat," Dickinson says. "When it first notices an approaching threat, a fly's body might be in any sort of posture depending on what it was doing at the time, like grooming, feeding, walking, or courting. Our experiments showed that the fly somehow 'knows' whether it needs to make large or small postural changes to reach the correct preflight posture. This means that the fly must integrate visual information from its eyes, which tell it where the threat is approaching from, with mechanosensory information from its legs, which tells it how to move to reach the proper preflight pose."

The results offer new insight into the fly nervous system, and suggest that within the fly brain there is a map in which the position of the looming threat "is transformed into an appropriate pattern of leg and body motion prior to take off," Dickinson says. "This is a rather sophisticated sensory-to-motor transformation and the search is on to find the place in the brain where this happens," he says.

Dickinson's research also suggests an optimal method for actually swatting a fly. "It is best not to swat at the fly's starting position, but rather to aim a bit forward of that to anticipate where the fly is going to jump when it first sees your swatter," he says.

The paper, "Visually Mediated Motor Planning in the Escape Response of Drosophila," will be published August 28 in the journal Current Biology.

The research was funded by the National Institutes of Health and the National Science Foundation.

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

http://www.sciencedaily.com/releases/2008/08/080828135901.htm

Rosetta Spacecraft On Its Way To Meet Asteroid Steins

On its way to comet 67/P Churyumov-Gerasimenko, Rosetta is targeting two asteroids for study: (2867) Steins, on 5 September 2008, and (21) Lutetia on 10 June 2010. (Credit: ESA TV)

ScienceDaily (Aug. 29, 2008) — ESA's Rosetta spacecraft will make a historic encounter with asteroid (2867) Steins on 5 September 2008. The doors of ESA's European Space Operations Centre (ESOC) in Darmstadt, Germany, will be open to the media as of 18:00 on 5 September to follow the fly-by events.

First images and results will be available for presentation to the media during a press conference which will be held at ESOC the following day, Saturday 6 September at 12:00 CEST.Steins is Rosetta's first nominal scientific target. The spacecraft will rendezvous with the asteroid in the course of its first incursion into the asteroid belt located between the orbits of Mars and Jupiter, while on its way to comet 67/P Churyumov-Gerasimenko.The study of asteroids is extremely important as they represent a sample of Solar System material at different stages of evolution – key to understanding the origin of our own planet and of our planetary neighbourhood. The closest approach to Steins is due to take place on 5 September at 20:58 CEST (Central European Summer Time), from a distance of 800 km, during which the spacecraft will not be communicating with Earth. First ground contact with the spacecraft and announcement of successful fly-by will take place at 22:23 CEST. The first data and images collected by Rosetta will be sent to Earth throughout the night of 5 to 6 September and will undergo preliminary processing in the morning of 6 September. The first images will be made available for broadcasters via a special satellite feed on Saturday 6 September (details will be given on http://television.esa.int).

Adapted from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2008/08/080828084407.htm

'Pristine' Amazonian Region Hosted Large, Urban Civilization

Picture from a low-flying airplane as it passes over the current Kuikuro village, demonstrating the circular-plaza village structure that has historically been and remains a primary cultural trait of urban construction. (Credit: Image courtesy of University of Florida)

ScienceDaily (Aug. 29, 2008) — They aren't the lost cities early explorers sought fruitlessly to discover.

But ancient settlements in the Amazon, now almost entirely obscured by tropical forest, were once large and complex enough to be considered "urban" as the term is commonly applied to both medieval European and ancient Greek communities.

So says a paper set to appear August 28 in Science co-authored by anthropologists from the University of Florida and Brazil, and a member of the Kuikuro, an indigenous Amazonian people who are the descendants of the settlements' original inhabitants.

"If we look at your average medieval town or your average Greek polis, most are about the scale of those we find in this part of the Amazon," said Mike Heckenberger, a UF professor of anthropology and the lead author of the paper. "Only the ones we find are much more complicated in terms of their planning."

The paper also argues that the size and scale of the settlements in the southern Amazon in North Central Brazil means that what many scientists have considered virgin tropical forests are in fact heavily influenced by historic human activity. Not only that, but the settlements – consisting of networks of walled towns and smaller villages, each organized around a central plaza – suggest future solutions for supporting the indigenous population in Brazil's state of Mato Grosso and other regions of the Amazon, the paper says.

"Some of the practices that these folks hammered may provide alternative forms of understanding how to do low level sustainable development today," Heckenberger said.

Heckenberger and his colleagues first announced the discovery of the settlements in a 2003 Science paper. The largest date from around 1250 to 1650, when European colonists and the diseases they brought likely killed most of their inhabitants.

The communities are now almost entirely overgrown. But Heckenberger said that members of the Kuikuro, a Xinguano tribe that calls the region home, are adept at identifying telltale landscape features that reveal ancient activity. These include, for example, "dark earth" that indicate past human waste dumps or farming, concentrations of pottery shards and earthworks. Also assisted by satellite imagery and GPS technology, the researchers spent more than a decade uncovering and mapping the obscured communities.

The new paper reports that the settlements consisted of clusters of 150-acre towns and smaller villages organized in spread out "galactic" patterns.

None of the large towns was as large as the largest medieval or Greek towns. But as with those towns, the Amazonian ones were surrounded by large walls – in their case, composed of earthworks still extant today. Among other repeated features, each Amazonian settlement had an identical formal road, always oriented northeast to southwest in keeping with the mid-year summer solstice, connected to a central plaza.

The careful placement of the like-oriented settlements is indicative of the regional planning and political organization that are hallmarks of urban society, Heckenberger said.

"These are not cities, but this is urbanism, built around towns," he said.

The findings are important because they contradict long-held stereotypes about early Western versus early New World settlements that rest on the idea that "if you find it in Europe, it's a city. If you find it somewhere else, it has to be something else," Heckenberger said.

"They have quite remarkable planning and self-organization, more so than many classical examples of what people would call urbanism," he said.

But the research is also important because it means at least one area of "pristine" Amazon has a history of human activity. That could change not only how scientists assess the flora and fauna, but also how conservationists approach preserving the remains of forest so heavily cleared it is the world's largest soybean producing area. "This throws a wrench in all the models suggesting we are looking at primordial biodiversity," Heckenberger said.

Around the communities the scientists found dams and artificial ponds that indicate inhabitants farmed fish near their homes. They also found the remnants of open areas and large compost heaps suggesting widespread near-town cultivation.

The research has been funded by the National Science Foundation.

Adapted from materials provided by University of Florida.
http://www.sciencedaily.com/releases/2008/08/080828162554.htm

Black Raspberries Slow Cancer By Altering Hundreds Of Genes

Black raspberries. New research strongly suggests that a mix of preventative agents, such as those found in concentrated black raspberries, may more effectively inhibit cancer development than single agents aimed at shutting down a particular gene. (Credit: iStockphoto/Denis Kheshchenik)

ScienceDaily (Aug. 29, 2008) — New research strongly suggests that a mix of preventative agents, such as those found in concentrated black raspberries, may more effectively inhibit cancer development than single agents aimed at shutting down a particular gene.

Researchers at the Ohio State University Comprehensive Cancer Center examined the effect of freeze-dried black raspberries on genes altered by a chemical carcinogen in an animal model of esophageal cancer.

The carcinogen affected the activity of some 2,200 genes in the animals' esophagus in only one week, but 460 of those genes were restored to normal activity in animals that consumed freeze-dried black raspberry powder as part of their diet during the exposure.

These findings, published in recent issue of the journal Cancer Research, also helped identify 53 genes that may play a fundamental role in early cancer development and may therefore be important targets for chemoprevention agents.

"We have clearly shown that berries, which contain a variety of anticancer compounds, have a genome-wide effect on the expression of genes involved in cancer development," says principal investigator Gary D. Stoner, a professor of pathology, human nutrition and medicine who studies dietary agents for the prevention of esophageal cancer.

"This suggests to us that a mixture of preventative agents, which berries provide, may more effectively prevent cancer than a single agent that targets only one or a few genes."

Stoner notes that black raspberries have vitamins, minerals, phenols and phytosterols, many of which individually are known to prevent cancer in animals.

"Freeze drying the berries concentrates these elements about ten times, giving us a power pack of chemoprevention agents that can influence the different signaling pathways that are deregulated in cancer," he says.

To conduct this study, Stoner and his colleagues fed rats either a normal diet or a diet containing 5 percent black-raspberry powder. During the third week, half the animals in each diet group were injected three times with a chemical carcinogen, N-nitrosomethylbenzylamine. The animals continued consuming the diets during the week of carcinogen treatment.

After the third week, the researchers examined the animals' esophageal tissue, thereby capturing gene changes that occur early during carcinogen exposure. Their analyses included measuring the activity, or expression levels, of 41,000 genes. In the carcinogen-treated animals, 2,261 of these genes showed changes in activity of 50 percent or higher.

"These changes in gene expression correlated with changes in the tissue that included greater cell proliferation, marked inflammation, and increased apoptosis," Stoner says.

In the animals fed berry powder, however, a fifth of the carcinogen affected genes – exactly 462 of them – showed near-normal levels of activity, when compared with controls. Most of these genes are associated with cell proliferation and death, cell attachment and movement, the growth of new blood vessels and other processes that contribute to cancer development. The tissue also appeared more normal and healthy.

Lastly, of the 462 genes restored to normal by the berries, 53 of them were also returned to normal by a second chemoprevention agent tested during a companion study.

"Because both berries and the second agent maintain near-normal levels of expression of these 53 genes, we believe their early deregulation may be especially important in the development of esophageal cancer," Stoner says.

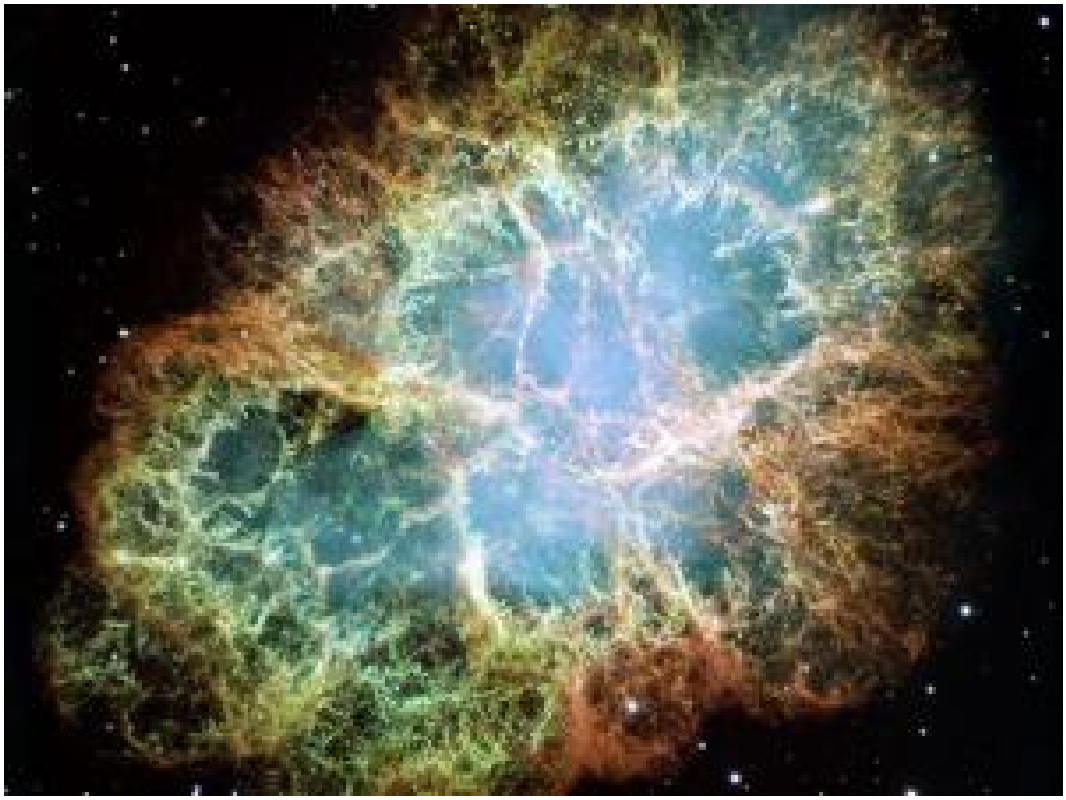
"What's emerging from studies in cancer chemoprevention is that using single compounds alone is not enough," Stoner says. "And berries are not enough. We never get 100 percent tumor inhibition with berries. So we need to think about another food that we can add to them that will boost the chemopreventive activities of berries alone."

Funding from the National Cancer Institute supported this research.

Adapted from materials provided by Ohio State University.

http://www.sciencedaily.com/releases/2008/08/080827163933.htm

Origin Of High Energy Emission From Crab Nebula Identified



The Crab Nebula from the Hubble Space Telescope. (Credit: NASA, ESA, J. Hester, A. Loll (ASU); Acknowledgement: Davide De Martin (Skyfactory))

ScienceDaily (Aug. 29, 2008) — Another piece of the jigsaw in understanding how neutron stars work has been put in place following the discovery by scientists of the origin of the high energy emission from rotation-powered pulsars.

Pulsar systems containing neutron stars accelerate particles to immense energies, typically one hundred times more than the most powerful accelerators on Earth. Scientists are still uncertain exactly how these systems work and where the particles are accelerated.

Now a team of researchers from the UK and Italy, led by Professor Tony Dean of the University of Southampton, has detected polarized gamma-ray emission from the vicinity of the Crab Nebula - one of the most dramatic sights in deep space. By using spectroscopic imaging and measuring the polarization - or the alignment - of the waves of high energy radiation in the gamma-ray band, they have shown that these energetic photons originate close to the pulsar.

The Crab Nebula is the result of a supernova explosion which was seen from Earth on 4 July 1054. The explosion left behind a pulsar or rotating neutron star with a nebula of radiating particles around it.

The neutron star contains the mass of the Sun squeezed into a volume of about 10 km radius, rotating very fast - about 30 times a second - thereby generating magnetic fields and accelerating particles. A highly collimated jet, aligned with the spin axis of the pulsar and a bright radiating torus around the pulsar, are also seen. The Crab is known to accelerate electrons, and possibly other particles, to extremely high energies, both along the jet and around the torus, where they can be traced in the gamma-ray domain.

Looking into the heart of the neutron star with a gamma-ray telescope on the European Space Agency's INTEGRAL spacecraft orbiting Earth, the researchers made a detailed study of the high energy radiation to assess their polarization. They deduced that the majority of the gamma-rays are derived directly from the jet.

They analysed data from over 600 individual observations of the Crab by the INTEGRAL spectrometer to assess the polarization of the gamma-rays and compared this data to the output from a sophisticated computer model.

The results show polarization with an electric vector aligned with the spin axis of the neutron star, demonstrating that a significant fraction of the high energy electrons responsible for the polarized photons are produced in a highly ordered structure close to the pulsar.

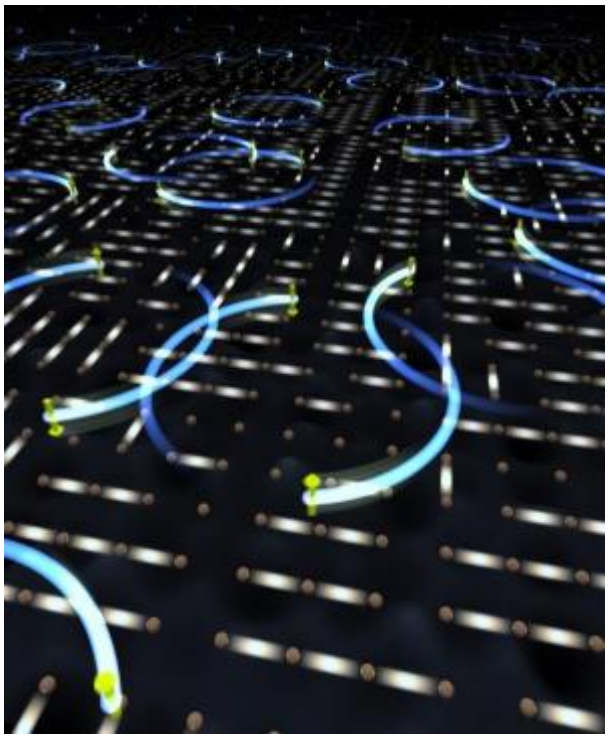
Professor Tony Dean of the University's School of Physics and Astronomy comments: "The remarkable alignment of the electric vector with the rotational axis of the pulsar, together with its similarity to the optical polarization angle, suggests that both fluxes originate at the same site close to the neutron star. The findings have clear implications on many aspects of high energy accelerators such as the Crab."

The result also may have profound implications for fundamental physics. Some theories of quantum gravity have predicted that at very short distances a particular direction in space would be picked out, breaking Lorentz invariance. A consequence of this would be that the polarization vector of light would slowly rotate as it propagated through space. The Crab Nebula has a well known rotational axis and now the first measurements of the polarization of gamma-rays have been shown to be aligned with it and not rotated away from it. This very strictly limits non-Lorentz invariance.

Adapted from materials provided by University of Southampton, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/08/080828172835.htm

Quantum 'Traffic Jam' Revealed: Findings May Help Get Current Flowing At Higher Temperatures



This image shows two states of a cuprate high-temperature superconductor simultaneously: Each circle represents the two electrons of a Cooper pair, which exist at relatively low energy and can carry current with no resistance. In this image, the superconducting Cooper-pair state is superimposed on a dashed pattern that indicates the static positions of electrons caught in a quantum "traffic jam" at higher energy - when the material acts as a Mott-insulator incapable of carrying current. (Credit: Image courtesy of DOE/Brookhaven National Laboratory)

ScienceDaily (Aug. 29, 2008) — Scientists at the U.S. Department of Energy's Brookhaven National Laboratory, in collaboration with colleagues at Cornell University, Tokyo University, the University of California, Berkeley, and the University of Colorado, have uncovered the first experimental evidence for why the transition temperature of high-temperature superconductors -- the temperature at which these materials carry electrical current with no resistance -- cannot simply be elevated by increasing the electrons' binding energy.

The research -- to be published in the August 28, 2008, issue of Nature -- demonstrates how, as electron-pair binding energy increases, the electrons' tendency to get caught in a quantum mechanical "traffic jam" overwhelms the interactions needed for the material to act as a superconductor -- a freely flowing fluid of electron pairs.

"We've made movies to show this traffic jam as a function of energy. At some energies, the traffic is moving and at others the electron traffic is completely blocked," said physicist J.C. Seamus Davis of Brookhaven National Laboratory and Cornell University, lead author on the paper. Davis will be giving a Pagels Memorial Public Lecture to announce these results at the Aspen Center for Physics on August 27.

Understanding the detailed mechanism for how quantum traffic jams (technically referred to as "Mottness" after the late Sir Neville Mott of Cambridge, UK) impact superconductivity in cuprates may point scientists toward new materials that can be made to act as superconductors at significantly higher temperatures suitable for real-world applications such as zero-loss energy generation and transmission systems and more powerful computers.

The idea that increasing binding energy could elevate a superconductor's transition temperature stems from the mechanism underlying conventional superconductors' ability to carry current with no resistance. In those materials, which operate close to absolute zero (0 kelvin, or -273 degrees Celsius), electrons carry current by forming so-called Cooper pairs. The more strongly bound those electron pairs, the higher the transition temperature of the superconductor.

But unlike those metallic superconductors, the newer forms of high-temperature superconductors, first discovered some 20 years ago, originate from non-metallic, Mott-insulating materials. Elevating these materials' pair-binding energy only appears to push the transition temperature farther down, closer to absolute zero rather than toward the desired goal of room temperature or above.

"It has been a frustrating and embarrassing problem to explain why this is the case," Davis said. Davis's research now offers an explanation.

In the insulating "parent" materials from which high-temperature superconductors arise, which are typically made of materials containing copper and oxygen, each copper atom has one "free" electron. These electrons, however, are stuck in a Mott insulating state -- the quantum traffic jam -- and cannot move around. By removing a few of the electrons — a process called "hole doping" -- the remaining electrons can start to flow from one copper atom to the next. In essence, this turns the material from an insulator to a metallic state, but one with the startling property that it superconducts -- it carries electrical current effortlessly without any losses of energy.

"It's like taking some cars off the highway during rush hour. All of a sudden, the traffic starts to move," said Davis.

The proposed mechanism for how these materials carry the current depends on magnetic interactions between the electrons causing them to form superconducting Cooper pairs. Davis's research, which used "quasiparticle interference imaging" with a scanning tunneling microscope to study the electronic structure of a cuprate superconductor, indicates that those magnetic interactions get stronger as you remove holes from the system. So, even as the binding energy, or ability of electrons to link up in pairs, gets higher, the "Mottness," or quantum traffic-jam effect, increases even more rapidly and diminishes the ability of the supercurrent to flow.

"In essence, the research shows that what is believed to be required to increase the superconductivity in these systems — stronger magnetic interactions -- also pushes the system closer to the 'quantum traffic-jam' status, where lack of holes locks the electrons into positions from which they cannot move. It's like gassing up the cars and then jamming them all onto the highway at once. There's lots of energy, but no ability to go anywhere," Davis said.

With this evidence pointing the scientists to a more precise theoretical understanding of the problem, they can now begin to explore solutions. "We need to look for materials with such strong pairing but which don't exhibit this Mottness or 'quantum traffic-jam' effect," Davis said.

Scientists at Brookhaven are now investigating promising new materials in which the basic elements are iron and arsenic instead of copper and oxygen. "Our hope is that they will have less 'traffic-jam' effect while having stronger electron pairing," Davis said. Techniques developed for the current study should allow them to find out.

This research was funded primarily by the Brookhaven Lab's Laboratory-Directed Research and Development Fund, by the Office of Basic Energy Sciences within DOE's Office of Science, by a Grant-in-Aid for Scientific Research from the Ministry of Science and Education (Japan), and by the 21st Century COE Program of the Japan Society for the Promotion of Science.

Adapted from materials provided by DOE/Brookhaven National Laboratory.

http://www.sciencedaily.com/releases/2008/08/080827163814.htm

Sending a Message by Shining a Light on What's Not Seen

By KEN JOHNSON

On the face of it, "Provocative Visions: Race and Identity" at the Metropolitan Museum of Art is a modest and not exceptionally illuminating exhibition. But time spent with this display of works by seven contemporary African-American artists brings to light an intriguing dichotomy between the visual and the verbal.

On the one hand, Chakaia Booker, Willie Cole and Alison Saar all favor a kind of postmodernist faux-primitivism by which they try to connect to ancestral roots. On the other hand, Glenn Ligon and Lorna Simpson produce works of language-based Conceptualism in which the absence of visual imagery becomes a metaphor for social invisibility. And bridging the gap between the mythic-image makers and the Conceptualists, Kara Walker and Whitfield Lovell relate to themes of both primitivism and visibility.

In this exhibition of works from the museum's permanent collection, organized by Lisa M. Messinger, an associate curator at the Met, the sculptures of Ms. Booker and Mr. Cole resemble works of African tribal art remade by urban folk artists. A spiky clump of cut-up rubber tire treads with a vaginal opening in front from which an alarming metal blade projects, "Raw Attraction" (2001), by Ms. Booker, is like a headdress for an African ceremonial dance.

Mr. Cole's "Shine" (2007), a masklike head made of more than a dozen black high-heeled women's shoes, also suggests ceremonial usage. And his graceful sculpture made from the frames of children's bicycles, also from 2007, evokes the totemic image of an antelope.

Ms. Saar does not use modern found materials as much, but her roughly carved wooden sculpture of a naked woman hanging upside down has hair represented by the business end of a broom. Painted a rich red color, the work, "Sweeping Beauty" (1997), exudes a voodooish spirit.

The problem with the sculptures of Ms. Booker, Mr. Cole and Ms. Saar is the pat and superficially clever relationship between the modern and the faux-tribal. They don't explore or analyze the allure of the primitive so much as they take it for granted as a motif they can play with. Consequently, the effect of their sculptures is mainly decorative.

"African American" (1997), Ms. Walker's large print depicting the all-black silhouette of a voluptuous, nude African woman with abundant pubic hair, offers a compelling explanation for the attraction of the primitive: its association with sexuality and semiconscious instinctual urges. Seen in proximity to works by Mr. Ligon and Ms. Simpson, Ms. Walker's piece also prompts thought about how racist fantasy can override and obscure ordinary human reality.

Each of a 1993 series of prints by Mr. Ligon imitates an antebellum-era wanted poster for a runaway slave. The funny twist is that the escapee described is Mr. Ligon himself. The descriptions are specific. He has a "wide lower face and narrow upper face" and "when he talks he usually has a big smile toward you, yet he faces you from a slightly different angle." But Mr. Ligon is not visually represented — he remains invisible in the sense that Ralph Ellison's Invisible Man was invisible. To be seen as black is to be unseen as a human being.

One of Mr. Ligon's stenciled word etchings from a 1992 series reaffirms this. Becoming murkier and more clotted the farther down the page they go, the black letters on a white ground repeat a line from an essay by Zora Neale Hurston: "I feel most colored when I am thrown against a sharp white background."

Ms. Simpson addresses black visibility in a more complicated way in "Props" (1995), a series of prints on panels made of white felt. Each is a photograph of a glass vase or bottle copied from an object in a picture by the Harlem photographer James VanDerZee. Under each image finely printed words describe the person or persons in the absent VanDerZee work.

Ms. Simpson's prints are enigmatic, but seen along with Mr. Ligon's works, they suggest how people associated with racial or ethnic groups — to the extent that they are identified primarily as members of such groups — can remain invisible as individuals.

Mr. Lovell's "Wise Like That" (2000) gives the impression of a folk-art altarpiece. The ghostly image of a black man in a jacket and tie from an antique found photograph has been drawn in charcoal on an old, weathered wooden panel. Hanging from hooks screwed into the lower edge are used tools and metal containers: a saw, a hammer, a pitcher, a cup.

Compared with the cool intellectuality of Mr. Ligon and Ms. Simpson's art, Mr. Lovell's is cloyingly sentimental. But like their work, his memorial to an unknown man invites us to think about who is seen and who is not, who is remembered and who is forgotten.

"Provocative Visions: Race and Identity — Selections From the Permanent Collection" remains through March 8 at the Metropolitan Museum of Art; (212) 535-7710, metmuseum.org.

http://www.nytimes.com/2008/09/02/arts/design/02visi.html?ref=design

When Fear and Chaos Are Normal, Peace and Safety Become Unimaginable

By MICHIKO KAKUTANI

"The genie of terrorism, chaos and mayhem has been unleashed onto this country as a result of American mistakes, and it can't be put back into a bottle," wrote the Wall Street Journal reporter Farnaz Fassihi in a September 2004 e-mail message. She described how the insurgency was growing stronger and more sophisticated every day, and how 110 people died and more than 300 were injured in Baghdad during one four-day period alone. She also described how the situation — replete with kidnappings, car bombs, sniper fire, land mines and I.E.D.'s — had turned reporting into a hazardous and frustrating experience:

"I avoid going to people's homes and never walk in the streets. I can't go grocery shopping anymore, can't eat in restaurants, can't strike up a conversation with strangers, can't look for stories, can't drive in anything but a fully armored car, can't go to scenes of breaking news stories, can't be stuck in traffic, can't speak English outside, can't take a road trip, can't say I'm an American, can't linger at checkpoints, can't be curious about what people are saying, doing, feeling. And can't and can't. ..." Although Ms. Fassihi's e-mail message was meant only for family and friends, it was eventually posted on the Internet, where it gained a mass audience. The personal quality of her missive and her candor about the difficulties of covering the war, she recalls, "grabbed the public in a way that my published pieces for the newspaper seldom did."

Ms. Fassihi's powerful new book, "Waiting for an Ordinary Day," is written in a similar spirit, and while it retraces much ground that will be familiar to readers of earlier accounts of the war — most notably the Washington Post reporter Anthony Shadid's deeply affecting 2005 book, "Night Draws Near: Iraq's People in the Shadow of America's War" — the volume's intimate portraits of ordinary Iraqis, combined with its forthright account of what it was like to be a reporter covering the war, leave us with a devastating sense of the fallout that the American invasion and occupation have had on civilians' daily lives.

Ms. Fassihi left Iraq in December 2005, , so her account deals only glancingly with the dangerous spiral of Sunni versus Shiite violence in 2006 and the positive changes wrought more recently by the surge of American troops, the Sunni awakening and a Shiite cease-fire. What her book does do — and does with visceral immediacy — is convey what life was like in Iraq in the immediate aftermath of the invasion, and how the United States's failure to restore law and order fed Iraqi resentment, and how that resentment, combined with nationalistic pride, fueled a snowballing insurgency as the occupation wore on.

Ms. Fassihi illustrates the dire consequences of the Bush administration's miscalculations (sending insufficient numbers of troops to prevent looting and secure the country; making the ill-judged decision to dissolve the Iraqi Army; and failing to restore electricity and other basic services), and she captures the bewilderment that even pro-American Iraqis felt as they saw the world's one superpower fail to contain the chaos and violence overtaking their country.

In addition, Ms. Fassihi — who spent her childhood in Iran before moving to the United States with her family shortly after the beginning of the Iran-Iraq war — does a memorable job of describing Iran's growing influence in a post-Saddam Iraq, noting the Islamic religiosity that began sweeping parts of the country and the growing constraints placed on women. It is Ms. Fassihi's snapshots of individual Iraqis — who have lost their homes, their businesses or the simple security of knowing they can go grocery shopping or take their children to school without the fear of a bomb or sniper attack — that lodge most insistently in the reader's mind. She introduces us to Omar Jumah, whose home happens to be in the American-controlled Green Zone, and who faces up to six hours of checkpoint traffic — and the risk of being blown up — every time he leaves the zone to visit relatives or friends in other parts of the city. She talks to an ambulance driver named Majid Bechai Leftah, who worries every day that he will be killed by Americans or insurgents or criminals as he makes his daily rounds.

And she describes the elaborate security precautions a man named Sabah takes in an effort to ensure that his son's wedding will come off safely. The service is moved from the family's regular church to one near the reception hall (to save guests from the hazards of driving long distances around Baghdad); armed guards are hired to stand by the door to help thwart a kidnapping or insurgent attack; and guests, heading from the church to the reception, are told to leave in 15-minute intervals to avoid a long procession that might attract attention. Ms. Fassihi tells the story of one of her bureau's drivers, Nahid, who is kidnapped along with his uncle, and the kidnappers' demand that the family turn over half a million dollars ransom within 24 hours; and the story of Haqqi, the Wall Street Journal's principal interpreter and office manager, who proudly votes in his first free election, only to rush back to the office in search of a Band-Aid, so that he can cover the purple ink on his finger.

"I don't want anyone in the street or in my neighborhood to see I voted," he says of the telltale ink. "It would get me killed." Given the constant hazards of life in occupied Iraq and Iraqis' reluctance to talk about their feelings or admit psychological trauma, Ms. Fassihi says, it's not surprising that many "pop antidepressants, anti-anxiety and sleeping pills like candy." Dr. Hashim Zainy, a psychiatrist at the Ibn Roshd psychiatric hospital, describes the Iraqi psyche like this:

"Anything can happen at any moment. You can't plan for the next day or the next hour. You are always afraid, in every waking hour and in your sleep. This chronic stress gives you a deep sense of helplessness, an inability to take charge of your life and make decisions. There is an internal weakening inside every Iraqi personality." As a reporter in an increasingly dangerous Baghdad, Ms. Fassihi has her own share of close calls: A car bomb explodes outside the house that she and several other journalists share, and on another occasion she and her driver narrowly escape kidnappers, who pursue them in a mad car chase through the streets of Baghdad. She begins spending more time worrying about her own safety and that of her staff than actually reporting, and finds herself becoming increasingly superstitious. "I have lucky boots for military embeds, a lucky scarf for road trips, a lucky handbag, and lucky days of the week," she writes. "I tap into my gut for 'right' or 'wrong' feelings about such simple things as whether I should go grocery shopping. On several occasions I've backed away from interviews at the last minute, once at the doorstep of the source's house, because my gut suddenly turned against it."

Ms. Fassihi says she has not met a single Iraqi whose "life hasn't been touched by the war or altered" because of the everyday violence. "I have heard this phrase from Iraqis over and over, 'Until now, we are still waiting,' " she says. "What are they waiting for, I wonder. Perhaps just for an ordinary day."

http://www.nytimes.com/2008/09/02/books/02kaku.html?ref=books

About Death, Just Like Us or Pretty Much Unaware?

By NATALIE ANGIER

As anybody who has grieved inconsolably over the death of a loved one can attest, extended mourning is, in part, a perverse kind of optimism. Surely this bottomless, unwavering sorrow will amount to something, goes the tape loop. Surely if I keep it up long enough I'll accomplish my goal, and the person will stop being dead.

Last week the Internet and European news outlets were flooded with poignant photographs of Gana, an 11-year-old gorilla at the Münster Zoo in Germany, holding up the body of her dead baby, Claudio, and pursing her lips toward his lifeless fingers. Claudio died at the age of 3 months of an apparent heart defect, and for days Gana refused to surrender his corpse to zookeepers, a saga that provoked among her throngs of human onlookers admiration and compassion and murmurings that, you see? Gorillas, and probably a lot of other animals as well, have a grasp of their mortality and will grieve for the dead and are really just like us after all. Nobody knows what emotions swept through Gana's head and heart as she persisted in cradling and nuzzling the remains of her son. But primatologists do know this: Among nearly all species of apes and monkeys in the wild, a mother will react to the death of her infant as Gana did — by clutching the little decedent to her breast and treating it as though it were still alive. For days or even weeks afterward, she will take it with her everywhere and fight off anything that threatens to snatch it away. "The only time I was ever mobbed by langurs was when I tried to inspect a baby corpse," said the primatologist Sarah Hrdy. Only gradually will she allow the distance between herself and the ever-gnarlier carcass to grow.

Yes, we're a lot like other primates, particularly the great apes, with whom we have more than 98 percent of our genes in common. Yet elaborate displays of apparent maternal grief like Gana's may reveal less about our shared awareness of death than our shared impulse to act as though it didn't exist. Dr. Hrdy, author of "Mother Nature" and the coming "Mothers and Others," said it made adaptive sense for a primate mother to hang onto her motionless baby and keep her hopes high for a while. "If the baby wasn't dead, but temporarily comatose, because it was sick or fallen from the tree, well, it might come back to life," Dr. Hrdy said. "We're talking about primates who have singleton births after long periods of gestation. Each baby represents an enormous investment for the mother."

Everywhere in nature, biologists say, are examples of animals behaving as though they were at least vaguely aware of death's brutal supremacy and yet unpersuaded that it had anything to do with them. Michael Wilson, an assistant professor of anthropology at the University of Minnesota who has studied chimpanzees at Jane Goodall's research site in Gombe, said chimps were "very different from us in terms of what they understand about death and the difference between the living and the dead." The Hallmark hanky moment alternates with the Roald Dahl macabre. A mother will try to nurse her dead baby back to

life, Dr. Wilson said, "but when the infant becomes quite decayed, she'll carry it by just one leg or sling it over her back in a casual way."

Juvenile chimpanzees display signs of genuine grief when their mothers die. In one famous case in Gombe, when a matriarch of the troop named Flo died at the age of 50-plus years, her son, Flint, proved inconsolable. Flint was 8 years old and could easily have cared for himself, but he had been unusually attached to his mother and refused to leave her corpse's side. Within a month, the son, too, died.Yet adult chimpanzees rarely react with overt sentimentality to the death of another adult, Dr. Wilson said. As a rule, sick or elderly adults go off into the forest to die alone, he said, and those that die in company often do so at the hands of other adults, who "sometimes make sure the victim is dead, and sometimes they don't," he said. The same laissez-faire attitude toward death-versus-life applies to chimpanzee hunting behavior. "When they're hunting red colobus monkeys, they will either kill the monkeys first or simply immobilize them and start eating them while they're still alive," Dr. Wilson said. "The monkey will continue screaming and thrashing as they pull its guts out, which is very unpleasant for humans who are watching."

For some animals, the death of a conspecific is a little tinkle of the dinner bell. A lion will approach another lion's corpse, give it a sniff and a lick, and if the corpse is fresh enough, will start to eat it. For others, a corpse is considered dangerous and must be properly disposed of. Among naked mole rats, for example, which are elaborately social mammals that spend their entire lives in a system of underground tunnels, a corpse is detected quickly and then dragged, kicked or carried to the communal latrine. And when the latrine is filled, said Paul Sherman of Cornell University, "they seal it off with an earthen plug, presumably for hygienic reasons, and dig a new one."Among the social insects, the need for prompt corpse management is considered so pressing that there are dedicated undertakers, workers that within a few minutes of a death will pick up the body and hoist or fly it outside, to a safe distance from hive or nest, the better to protect against possible contagious disease. Honeybees are such compulsive housekeepers that if a mouse or other large creature, drawn by the warmth or promise of honey, happens to make its way into the hive and die inside, the bees, unable to bodily remove it, will embalm it in resin collected from trees. "You can find mummified mice inside beehives that are completely preserved right down to their whiskers," said Gene E. Robinson, professor of entomology at the University of Illinois in Urbana-Champaign.

But all is not grim for those dead in tooth and claw. Researchers have determined that elephants deserve their longstanding reputation as exceptionally death-savvy beings, their concern for the remains of their fellows approaching what we might call reverence. Reporting in the journal Biology Letters, Karen McComb of the University of Sussex and her colleagues found that when African elephants were presented with an array of bones and other natural objects, the elephants spent considerably more time exploring the skulls and tusks of elephants than they did anything else, including the skulls of rhinoceroses and other large mammals.

George Wittemyer of Colorado State University and his colleagues described in Applied Animal Behavior Science the extraordinary reactions of different elephants to the death of one of their prominent matriarchs. "One female stood over the body, rocking back and forth," Dr. Wittemyer said in an interview. "Others raised their foot over her head. Others touched their tusks to hers. They would do their behaviors, and then leave."

They were saying goodbye, or maybe, Won't you please come back home?

http://www.nytimes.com/2008/09/02/science/02angi.html?ref=science

Beyond Carbon: Scientists Worry About Nitrogen's Effects

By RICHARD MORGAN

TOOLIK FIELD STATION, Alaska — As Anne Giblin was lugging four-foot tubes of Arctic lakebed mud from her inflatable raft to her nearby lab this summer, she said, "Mud is a great storyteller."

Dr. Giblin, a senior scientist at the Marine Biological Laboratory in Woods Hole, Mass., is part of the Long Term Ecological Research network at an Arctic science outpost here operated by the University of Alaska at Fairbanks.

Public discussion of complicated climate change is largely reduced to carbon: carbon emissions, carbon footprints, carbon trading. But other chemicals have large roles in the planet's health, and the one Dr. Giblin is looking for in Arctic mud, one that a growing number of other researchers are also concentrating on, is nitrogen.

In addition to having a role in climate change, nitrogen has a huge, probably more important biological impact through its presence in fertilizer. Peter Vitousek, a Stanford ecologist whose 1994 essay put nitrogen on the environmental map, co-authored a study this summer in the journal Nature that put greater attention on the nitrogen cycle and warned against ignoring it in favor of carbon benefits.

For example, Dr. Vitousek said in an interview, "There's a great danger in doing something like, oh, overfertilizing a cornfield to boost biofuel consumption, where the carbon benefits are far outweighed by the nitrogen damage."

Soon after Dr. Vitousek's report, the journal Geophysical Research Letters branded as a "missing greenhouse gas" nitrogen trifluoride, which is used in production of semiconductors and in liquid-crystal displays found in many electronics. According to the report, it causes more global warming than coal-

fired plants. Nitrogen trifluoride, which is not one of the six gases covered by the Kyoto Protocol, the celebrated international global warming accord, is about 17,000 times more potent than carbon dioxide. Its estimated worldwide release into the atmosphere this year is equivalent to the total global-warming emissions from Austria.

"The nitrogen dilemma," Dr. Vitousek added, "is not just thinking that carbon is all that matters. But also thinking that global warming is the only environmental issue. The weakening of biodiversity, the pollution of rivers, these are local issues that need local attention. Smog. Acid rain. Coasts. Forests. It's all nitrogen."

Dr. Vitousek's summer report followed a similar account in May in the journal Science by James N. Galloway, an environmental sciences professor at the University of Virginia and a former chairman of the International Nitrogen Initiative, a group of scientists pushing for smarter use of nitrogen.

Dr. Galloway is developing a universal calculator for individual nitrogen footprints. "It's Goldilocks's problem," he said in an interview. "Reactive nitrogen isn't a waste product. We need it desperately. Just not too much and not too little. It's just more complicated than carbon." He continued, "But we're not going to get anywhere telling people this is simple or easy."

Dr. Giblin of Woods Hole spent the summer at the field station here, midway between the Arctic Circle and the Arctic Ocean, researching the nitrogen content of lakebed sediment — not the inert nitrogen that makes up 80 percent of air, the reactive nitrogen that Dr. Galloway referred to. In forms like nitric acid, nitrous oxide, ammonia and nitrate it plays a variety of roles.

Nitrogen is part of all living matter. When plants and animals die, their nitrogen is passed into soil and the nitrogen in the soil, in turn, nourishes plants on land and seeps into bodies of water. Dr. Giblin is pursuing her research because as the Arctic warms, the tundra's permafrost will thaw, and the soil will release carbon and nitrogen into the atmosphere.

When an ecosystem has too much nitrogen, the first response is that life blossoms. More fish, more plants, more everything. But this quickly becomes a kind of nitrogen cancer. Waters cloud and are overrun with foul-smelling algae blooms that can cause toxic "dead zones." Scientists call this process eutrophication, but the laymen's translation is that the water gets mucked up beyond all recognition. A recent such plague bedeviled China when its Yellow Sea was smothered in algae at Qingdao, the planned site of Olympic sailing events this summer. More than mere inconvenience, such problems routinely threaten many coastal areas and riverside communities.

Nancy Rabalais, executive director of the Louisiana Universities Marine Consortium, is known as Queen of the Dead Zone. She cruises around the Gulf of Mexico every summer in the research vessel Pelican to look for damage from nitrogen-rich river flows into the gulf. This year, she expects a dead zone that will beat the Massachusetts-size 8,500-square-mile bloom of 2002.

One of the problems, Dr. Rabalais said, is that the Mississippi River involves so many communities that it requires stronger federal guidance, which she said was not a part of the Bush administration's policies. She is part of a national research committee financed by the Environmental Protection Agency and run by the National Academies of Science, but, she said, "it's so much talk and not enough action."

She continued: "Because you're not just going up against the agribusiness lobby, but also the livelihood of farmers. It's not exactly popular in the Midwest."

Fertilizer use is largely inefficient. With beef, only about 6 percent of nitrogen used in raising cows ends up in their meat; the rest leeches out into air or water supplies. With pork, it is 12 percent; chicken, 25

percent. Milk, eggs and grain have the highest efficiency, about 35 percent, or half of what, in the metric of report cards, is a C-minus.

"Look," she said, "you just can't have all these states and all these communities knowingly overfertilizing their land because they want a bumper crop every year. That's just all kinds of bad. But Des Moines, for example, is willing to filter their drinking water to an extra degree just to be able to flood their water supply with more-than-normal levels of fertilizer."

Reactive nitrogen competes with greenhouse gases that have greater public awareness. "But it's like looking at malaria and AIDS in Africa," Dr. Rabalais said. "They're both problems. And they both need vigilant attention."

Environmentalists face the puzzle of how to deal with multiple problems at once. And some worry that after the hard-fought campaign spotlighting carbon, turning to focus on nitrogen could upset that momentum.

The tension can plague even the most informed and articulate campaigners. "One of the many complexities that complicate the task I've undertaken is complexity," said Al Gore, the former vice president who won a Noble Peace Prize for his environmental work. Mr. Gore added, "Look, I can start a talk by saying, 'There are 14 global warming pollutants, and we have a different solution for addressing each of them.' And it's true. But you start to lose people."

http://www.nytimes.com/2008/09/02/science/02nitr.html?ref=science

Spot on Popularity Scale Speaks to the Future; Middle Has Its Rewards

By BENEDICT CAREY

The cult of popularity that reigns in high school can look quaint from a safe distance, like your 20th reunion. By then the social order may have turned over like an hourglass: teenagers who were socially invisible have emerged as colorful characters, confident, transformed. Others seem preserved in time, same as ever, while some former princes and queen bees are diminished or simply absent, now invisible themselves.

For years researchers focused much attention on those prominent teenagers, tracking their traits and behaviors. The studies found, to no one's surprise, that social dominance in adolescence often involves an aggressive, selfish streak that may not play well outside the locker-lined corridors.

The cult disbands, and the rules change.

Yet high school students know in their gut that popularity is far more than a superficial, temporary competition, and in recent years psychologists have confirmed that intuition. The newer findings suggest that adolescents' niche in school — their popularity, and how they understand and exploit it — offers important clues to their later psychological well-being.

"When you get to be a teenager, your social world broadens," said Kathleen Boykin McElhaney, a psychologist at the University of Massachusetts. "Kids may have a part-time job, be involved in a church group, a clique at school, all of which can broaden the perception of what popularity is and what it means."

Social scientists map the social topology of a school by having students rate their peers on various measures, including likeability. For instance, the question "Who would you most like to hang around with on a Saturday?" quickly reveals a list of those who are considered the best company (potential dates excluded). This is a different measure of popularity from prominence — the quarterback and the cutest cheerleader may or may not qualify — and identifies a gifted class of a different kind.

Some 15 to 20 percent of high school students fall into this category, according to Mitchell Prinstein, a professor of psychology at the University of North Carolina, and it's not hard to find them. They tend to have closer friendships, to excel academically and to get on well with most others, including parents — their own and their friends'.

In a continuing study of 185 students in a school in Charlottesville, Va., researchers led by Joseph P. Allen of the University of Virginia have concluded that this group is "characterized by a degree of openness to strong emotional experience" and optimism about their relationships, past and future. "These are very, very socially skilled kids who are really able to master the intricacies of diverse social situations," Dr. Allen said in a phone interview.

Surveys suggest that about 50 percent of students are average — that is, they have good friends but are neither especially liked nor disliked by classmates. The remaining 30 to 35 percent are split between low-status or "rejected" students, who are on the bottom of the heap, and neglected ones, who don't show up on the radar at all.

Yet most youngsters in any school know who their popular, likable peers are, and can learn by observation in a dynamic social situation that, after all, lasts four years. "We have evidence that the neglected kids are the ones most likely to move up, or to move between groups," Dr. Prinstein said. "These are the ones with no established reputation, they kind of blend into the woodwork, and this can give them a kind of freedom."

The same cannot be said of the rejected group, on the lowest rung on the ladder. In several remarkable studies, researchers have brought together students from different schools, representing different levels of the social hierarchy. Within hours, sometimes less, the children assume their accustomed places — the popular ones on top, the socially awkward on the bottom. Climbing out of the geek ghetto is hard, even if a child knows what likeability looks like.

Children outside the popular club sometimes compensate by effectively deluding themselves. A yearlong study of 164 students ages 13 and 14, published in May, found that the teenagers' rating of their own popularity — regardless of their peers' ratings — was a strong predictor of their psychological and academic adjustment.

A clique of misfits, with nary a prom date among them, can create their own internal definition of acceptance. "What this tells me is that we ought to be asking kids themselves where they stand," said Dr. McElhaney, the lead author of the study. "If you feel like you fit in, wherever it is you fit in, then you'll fare well." If not, the road is much tougher, she said.

Popularity, even the likable kind, can have costs. In his continuing study, Dr. Allen has found that the most socially skilled students are three times as likely to be drinking by age 14 as those outside the group. Up through age 18, they are also more likely to commit vandalism, smoke marijuana and shoplift. They are, in short, seemingly more vulnerable to peer pressure and expectations.

Some of those behaviors may just be due to increased opportunity and access: you can't sample from the buffet if you're not invited to the party.

But that is ultimately for the teenagers who see it unfolding every day to assess. If high school is the first time young people take on a public identity, it is also the best vantage point for seeing the blessings and risks of social charm.

Maybe that's why some teenagers can seem at once so self-deluded about their own standing and fascinated by the doings of the in group. They know intuitively that a crucial part of a high school education happens outside the classroom, in Popularity Studies 101.

Ask a few at the next reunion. The cult has disbanded, the party is open to all, and they'll have some stories to tell.

http://www.nytimes.com/2008/09/02/health/02mind.html?ref=science

Addiction Doesn't Discriminate? Wrong

By SALLY SATEL, M.D

We've heard it before. "Drug abuse is an equal opportunity destroyer." "Drug addiction is a bipartisan illness." "Addiction does not discriminate; it doesn't care if you are rich or poor, famous or unknown, a man or woman, or even a child."

The phrase "addiction doesn't care" is not meant to remind us that addiction casts a long shadow — everyone knows that. Rather, it is supposed to suggest that any individual, no matter who, is vulnerable to the ravages of drugs and alcohol.The same rhetoric has been applied to other problems, including child abuse, domestic violence, alcoholism — even suicide. Don't stigmatize the afflicted, it cautions; you could be next. Be kind, don't judge.

The democratization of addiction may be an appealing message, but it does not reflect reality. Teenagers with drug problems are not like those who never develop them. Adults whose problems persist for decades manifest different traits from those who get clean.

So while anyone can theoretically become an addict, it is more likely the fate of some, among them women sexually abused as children; truant and aggressive young men; children of addicts; people with diagnosed depression and bipolar illness; and groups including American Indians and poor people.

Attitudes, values and behaviors play a potent role as well.

Imagine two people trying cocaine, just to see what it is like. Both are 32-year-old men with jobs and families. One snorts a line, loves it and asks for more. The other also loves it but pushes it away, leaves the party and never touches it again. Different values? Different tolerance for risk? Many factors may distinguish the two cocaine lovers, but only one is at risk for a problem.

Asking for more drug is no guarantee of being seduced into routine use. But what if it happens? Jacob Sullum, a senior editor at Reason magazine, has interviewed many users who became aware that they were sliding down the path to addiction.

"It undermined their sense of themselves as individuals in control of their own destinies," Mr. Sullum wrote in his 2003 book, "Saying Yes: In Defense of Drug Use." "And so they stopped."

I only read about these people. Patients who come to our methadone clinic are there, obviously, because they're using. The typical patient is someone who has been off heroin for a while (maybe because life was good for while, maybe because there was no access to drugs, maybe because the boss did urine testing) and then resumed.But the road to resumption was not unmarked. There were signs and exit ramps all along the way. Instead of heeding them, our patients made small, deliberate choices many times a day — to be with other users, to cop drugs for friends, to allow themselves to become bored — and soon there was no turning back.

Addiction does indeed discriminate. It "selects" for people who are bad at delaying gratification and gauging consequences, who are impulsive, who think they have little to lose, have few competing interests, or are willing to lie to a spouse.

Though the National Institute on Drug Abuse describes addiction as a "chronic and relapsing disease," my patients, seeking help, are actually the exception. Addiction is not an equal opportunity destroyer even among addicts because, thankfully, most eventually extricate themselves from the worst of it.

Gene Heyman, a lecturer and research psychologist at Harvard Medical School and McLean Hospital, said in an interview that "between 60 and 80 percent of people who meet criteria for addiction in their teens and 20s are no longer heavy, problem users by their 30s." His analysis of large national surveys revealed that those who kept using were almost twice as likely to have a concurrent psychiatric illness.

None of this is to deny that brain physiology plays a meaningful role in becoming and staying addicted, but that is not the whole story.

"The culture of drink endures because it offers so many rewards: confidence for the shy, clarity for the uncertain, solace to the wounded and lonely," wrote Pete Hamill in his memoir, "A Drinking Life." Heroin and speed helped the screenwriter Jerry Stahl, author of "Permanent Midnight," attain the "the soothing hiss of oblivion."

If addiction were a random event, there would be no logic to it, no desperate reason to keep going back to the bottle or needle, no reason to avoid treatment.

The idea that addiction doesn't discriminate may be a useful story line for the public — if we are all under threat then we all should urge our politicians to support more research and treatment for addiction. There are good reasons to campaign for those things, but not on the basis of a comforting fiction.

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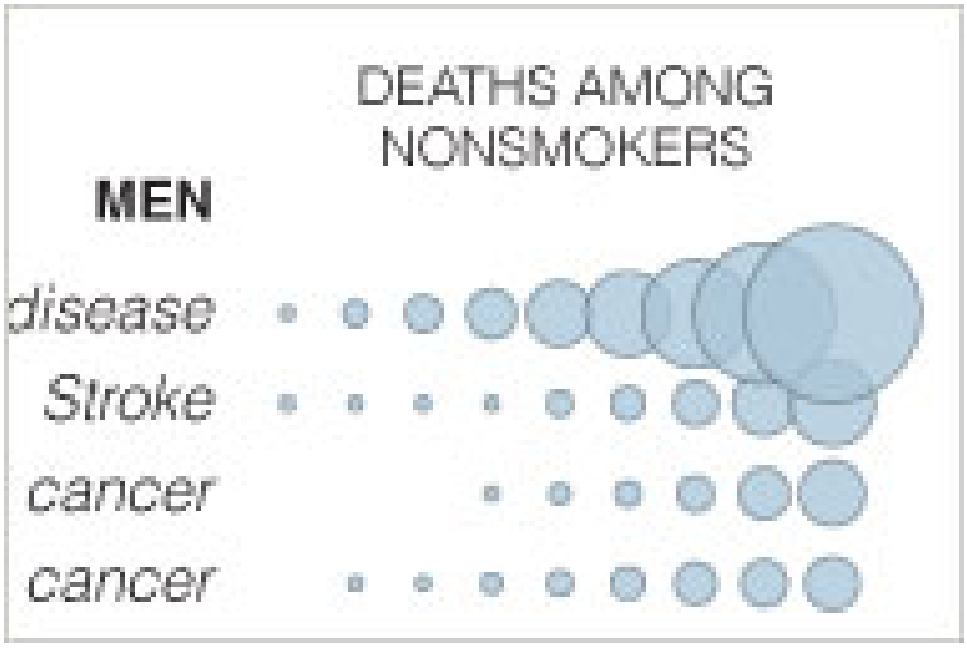
http://www.nytimes.com/2008/09/02/health/26essa.html?_r=1&ref=science&oref=login

The Odds It Will Kill You? See New Charts

By NICHOLAS BAKALAR



A 55-year-old man who smokes is as likely to die in the next 10 years as a 65-year-old who has never smoked. Less than 1 woman in 1,000 younger than 50 will die in the next decade from cervical cancer. A 35-year-old nonsmoking man is five times as likely to die in an accident before 45 as he is to die of heart disease, and a 35-year-old woman is twice as likely to die accidentally by 45 as she is to die from breast cancer.

New risk charts in a paper published in The Journal of the National Cancer Institute provide a broader perspective than most of the risk calculators on the Internet, because they cover the risks for 10 different causes of death, and for all causes combined, while differentiating by age and between smokers, nonsmokers and former smokers.

At first glance, it may appear that smokers and nonsmokers die of heart disease at the same rate, but a 35-year-old male smoker is seven times as likely to die of heart disease as a nonsmoker the same age. The numbers begin to converge as some smokers survive the more common smokers' diseases, and by age 75, their rate of death from heart disease is almost the same as nonsmokers'.

Dr. Lisa M. Schwartz, a co-author of the paper and an associate professor of medicine at Dartmouth, said people were often presented with statistics intended to frighten them about a particular disease. But a disease may present a large risk to some and very little to others. "These charts allow you to get stats that are about people who are more like you," she said.

Another advantage of the new charts, Dr. Schwartz said, is the 10-year time frame. "Often numbers are presented as lifetime statistics, which make the risk look too large, or as one-year statistics, which make the risk look too small. The charts provide the information you need to understand a risk, and whether to consider taking some action to reduce it." **NICHOLAS BAKALAR**

http://www.nytimes.com/2008/09/02/health/02stat.html?ref=science

Two of a Kind

By JIM HOLT

THE SAME MAN

George Orwell and Evelyn Waugh in Love and War

By David Lebedoff

Illustrated. 264 pp. Random House. $26

This book has a thesis, and it is, on the face of it, a preposterous one: George Orwell = Evelyn Waugh.

Why is this preposterous? Because Orwell and Waugh were, in almost every salient respect, precise opposites. Orwell conjured up the nightmarish dystopia of "1984." Waugh's best-known work, "Brideshead Revisited," was a reverie about a vanished age of Oxford privilege, titled Catholic families, large country houses and fastidious conscience. Orwell was tall, gaunt and self-mortifying, a socialist with an affinity for mineworkers and tramps. Waugh was a short, plump, florid social climber and a proud reactionary who declared, "I do not aspire to advise my sovereign in her choice of servants." Orwell fought on the loyalist side in the Spanish Civil War. Waugh announced, "If I were a Spaniard I should be fighting for General Franco." Orwell could tell you how to make a perfect cup of tea or where the best place was to roast a potato (under the meat). Waugh could give you advice on laying down a wine cellar or dressing like Beau Brummel on a budget. Orwell thought "good prose is like a window pane," forceful and direct. Waugh was an elaborate stylist whose prose ranged from the dryly ironical to the richly ornamented and rhetorical. Orwell was solitary and fiercely earnest. Waugh was convivial and brutally funny. And, perhaps most important, Orwell was a secularist whose greatest fear was the emergence of Big Brother in this world. Waugh was a Roman Catholic convert whose greatest hope lay with God in the next. Indeed, about the only thing Orwell and Waugh seem to have had in common was the rather boring fact that they were both Englishmen born to middle-class families in 1903.

So what could David Lebedoff be getting at in "The Same Man"? Is he deliberately trafficking in paradox? Is he employing some sort of dialectical magic in which each thing is identical to its opposite? Such suspicions put me in an irritable mood when I began reading his book. But irritation soon gave way to pleasure in this well-told story of two endlessly fascinating 20th-century lives — pleasure that briefly turned to irritability again toward the end.

Lebedoff, a Minneapolis lawyer and the author of "Cleaning Up," a courtroom drama about the Exxon Valdez oil spill, may seem an improbable candidate to write a book like this. But he obviously has a passionate interest in both Orwell and Waugh, and has ingratiated himself with Waugh's children and grandchildren, who gave him access to the novelist's letters, diaries and other memorabilia. Lebedoff writes in an easy, genial, clear-as-gin style (marred only occasionally by wince-making sentences like "So Waugh was the toast of London, though badly burned"). And he has an eye for the arresting detail that makes his "same man" thesis seem perhaps not so preposterous after all.

Both Orwell and Waugh, for example, were uncommonly brave in war. And in each case, that bravery seemed born of an almost foolhardy contempt for danger. Orwell was shot through the throat and nearly killed by a fascist sniper in the Spanish Civil War when he casually stood up in the trenches to light a cigarette. Waugh showed similar sang-froid in the Second World War when he calmly strolled through Luftwaffe machine-gun fire wearing a bright white duffle coat that presented the perfect target. "You bloody little swine, take off that coat!" yelled his friend and fellow officer Randolph Churchill (son of Winston). To which the unruffled Waugh replied, "I'll tell you what I think of your repulsive manners when the bombardment is over."

Such anecdotes of physical bravery go to a deeper affinity between the two men: their shared fearlessness in opposing what Orwell called the "smelly little orthodoxies" of the day. For Orwell, the smelliest of these was the reverence of the British left for Stalin. His genius was to write a children's fable, "Animal Farm," with its wonderfully named pigs Napoleon and Snowball, that broke the hold of Soviet propaganda on the English intelligentsia. (Lebedoff stresses how hard it was for Orwell to get the manuscript published, with even editors like T. S. Eliot chary of offending Uncle Joe.)

Waugh's defiance of his time was as marked as Orwell's, if often more theatrical and eccentric: he denied that Britain was a democracy and, in his militant Catholicism, went so far as to regret the defeat of the Spanish Armada. To Waugh, the enemy looming "in plain view" was not merely Hitler or Stalin; it was "the Modern Age in arms."

Dissimilar though their causes may have been, Orwell and Waugh were both anchored by "a hatred of moral relativism"; that, Lebedoff claims, is what set the two men apart from their contemporaries. Yet in stressing this similarity, the author elides a deeper difference. Although Waugh despaired about the future, he saw the Catholic Church as an enduring bulwark against chaos. His moral order was backed by divine authority. Orwell too was a passionate believer in objective truth, including moral truth. But unlike Waugh, Orwell did not attribute transcendent power to the truth; indeed, he feared that it might ultimately prove impotent in history. Hence his terrifying vision in "1984" of a future of totalitarian sadism, of "a boot stamping on a human face — forever."

Orwell and Waugh met only once, in 1949, when Orwell was lying sick in a sanitarium, six months before his death. (Waugh himself died in 1966, collapsing in the toilet after Easter Mass, his soul shriven.) The two men admired each other — up to a point. Orwell thought Waugh was about as good as a novelist could be while holding "untenable" beliefs. "One cannot really be Catholic & grown up," he wrote. Waugh thought Orwell was as good as a thinker could be while neglecting nine-tenths of reality: the supernatural part. He wrote to Orwell apropos of "1984" that "men who love a crucified God need never think of torture as all-powerful."

Even if you tend to come down on Orwell's side here, you have to admit that Waugh's comic vision has aged better than Orwell's tragic one. Nothing is as freshly funny as the destruction of innocence in early Waugh novels like "Decline and Fall" and "A Handful of Dust." But Orwell's darkest forebodings seem to be receding into the past (except perhaps in North Korea).

Were Orwell and Waugh alive today, they would no doubt "dread and abhor much about our time," as Lebedoff writes. But would their Catalog of the Abhorred be as trite as the author's? In the final pages of the book, Lebedoff inveighs against e-mail, reality shows, Al Gore's use of English and the "atonality" of the voices on National Public Radio, inter alia, and suggests that the "delete" button on the laptop keyboard is "the scariest feature of our own time." Too bad that this enjoyable and provocative book should end on a note of bathos.

Jim Holt, a contributing writer for The Times Magazine, is the author of "Stop Me if You've Heard This: A History and Philosophy of Jokes."

http://www.nytimes.com/2008/08/31/books/review/Holt-t.html?_r=1&8bu&emc=bua2&oref=slogin

Strange New World

By LIESL SCHILLINGER

THE ROAD HOME

By Rose Tremain

417 pp. Little, Brown & Company. $24.99

Many people long to write novels and some manage to do so, often at terrible personal cost. Balzac fueled his prodigious productivity by drinking pot after pot of coffee, night after night, and may have died of caffeine poisoning. Flaubert, according to his biographer Francis Steegmuller, was tormented by the ordeal of "Madame Bovary" — a friend had suggested the idea, then badgered him into writing the book. "I feel as dreary as a corpse," Flaubert confessed midproject. "My accursed Bovary torments and confounds me." But reading any novel by Rose Tremain, one suspects that what is torture for so many writers comes naturally to her. She has written about a dozen novels, set in different eras and places: Restoration England, present-day Paris, Denmark in the late Renaissance, New Zealand during the mid-19th-century gold rush, a Suffolk farm community in the 1950s. Each book has an entirely distinct voice, tone and subject, but all have an equal vigor, fluency and authenticity of characterization. Tremain seems to enter every one of her novels as if she were playing a game — let's call it "Author" — whose rules she confidently reinvents with each new hand.

Her latest novel, "The Road Home," is concerned with the struggles of a widowed, middle-aged immigrant, Lev, who leaves his Russian village when the sawmill closes. ("They ran out of trees," he explains, a poignant reduction of an insoluble problem.) Soon after, Lev travels to London to find work so he can send money home to his mother, his 5-year-old daughter and his best friend. Journeys like Lev's are very much a part of Britain's present reality, with discussion of the Eastern European invasion appearing all over. But Tremain elevates the subject beyond its outlines by making Lev not a statistic or a caricature or the standard-bearer of a trend but simply a man — fully embodied, his ignoble and noble acts presented without exaggeration, without excessive praise or condemnation. His difficulties, though specific, are not exceptional.

As Lev fearfully, tentatively navigates this strange new city, still mourning his wife, who died of leukemia at 36, he gets to know other Londoners. Ahmed, a Muslim kebab-shop owner struggling to keep his business afloat in the post-9/11 world, gives him his first job, distributing leaflets. ("What's up?" Ahmed asks quietly when he hears Lev weeping in the men's room. "Nothing," Lev says. To which Ahmed responds, "When men cry, it is never for nothing.") Lev also meets Christy, a divorced Irish plumber who resents his upwardly mobile ex-wife and pines for his daughter; and Sophie, a young chef with a lizard tattoo who flirts with the restaurant's celebrity guests but fusses over elderly people on Sundays at a retirement home called Ferndale Heights. Ruby, one of the Ferndale residents, is a rich old woman whose grown children neglect her. When Lev accompanies Sophie on her visits, Ruby confides her "guilt at how useless my life has been" and shares memories of her childhood in India, particularly a school pageant for the British viceroy, when she held half of the letter "O" in a welcome sign. "I sometimes think," she confides, "That's all your life has amounted to, Ruby Constad, being half of something."

Lev meets other economic migrants: a Russian woman on her own path to self-reinvention, who looks "determinedly straight ahead, like a gymnast trying to balance on a beam"; a teenage Russian kitchen worker; and two Chinese field laborers, Jimmy and Sonny, who laugh as they harvest asparagus, offering living proof that you can create your own happiness, even in far from happy circumstances. Tremain understands there's heroism in the everyday act of survival, and she gradually brings Lev to the point where he can see this for himself.

Back in Auror, his village in Russia, Lev had left the heroics to his best friend, Rudi, a cocky dreamer whose battered sky-blue Chevrolet ("my girl," "my baby," but most often "the Tchevi") has been converted into a taxi, its front door secured with the hinges from a baby's pram, its windows de-iced with vodka. In London, Lev captivates his new friends with anecdotes about Rudi, not ready to take on the responsibility of generating his own story.

After sleeping under trees and behind bushes to conserve his meager store of £20 notes, Lev moves into an apartment in a "street of choky little houses, called Belisha Road," with the lonely Irishman, Christy. He takes a bunk bed in the room Christy's young daughter had previously occupied: "He felt lucky to have found Christy Slane, to have been given a child's room. He wasn't too embarrassed or proud to lay his head on a pillowcase printed with giraffes." And he finds solace in the emotional bond he and his roommate share. "They both longed," Tremain writes, "to return to a time before the people they loved most were lost."

After Lev finds a menial job in the chic restaurant where Sophie works, he slowly moves up the food chain to vegetable preparer, taking baby steps toward a career as a chef. "I should feel grateful that the sawmill closed," he tells himself. Otherwise he might have ended up like his father, "enslaved to a lumberyard until I died, and to the same lunch each day, and to the snow falling and drifting, year on year, falling and drifting in the same remote and backward places."

But while Lev may have dodged a backward existence by coming to London, he's not exactly going forward, either. It takes a call from Rudi, informing him that his past is under siege — the village of Auror is about to be drowned by the construction of a dam — to shove Lev out of neutral. He can no longer take refuge in his past, which will soon be underwater.

How can Rudi drive the fabled Tchevi once Auror is submerged? How will Lev's mother and daughter manage to survive, with no address where he can send his weekly installments of foreign aid? The shock of this news jump-starts Lev, pushing him to action. Can he use his newfound cooking skills and connections to build a restaurant back in Russia? If he does, will anyone come?

A less disciplined and agile author might have been tempted to ease Lev's transition from daydreamer to doer. Or she might have jollied Lev into a toque at London's River Café and set Rudi up as a chauffeur on Belisha Road. But Rose Tremain is in the business of inventing not so much fantasies as alternate realities. In "The Road Home," she lets Lev in on her secret: "Don't think about Auror down there in the darkness. Don't think about the past." The present is also a work of imagination.

Liesl Schillinger is a regular contributor to the Book Review.

http://www.nytimes.com/2008/08/31/books/review/Schillinger-t.html?8bu&emc=bua2

Anthromusicology

By DAVE ITZKOFF

THE WORLD IN SIX SONGS

How the Musical Brain Created Human Nature

By Daniel J. Levitin

354 pp. Dutton. $25.95

What do the following scenes have in common? A pubescent boy becomes the star ofhis sleep-away camp by introducing his bunkmates to Poison's heavy-metal hit "Talk Dirty to Me"; a young man learns to fear Janis Ian's "At Seventeen" because it is the one song his mother always plays when his father doesn't come home at night; a prospective groom and bride give their D.J. instructions not to play any sexually explicit hip-hop jams that might perplex guests of a certain age.

You could make the case that these are all crucial steps in the development of a decidedly Caucasian musical sensibility, and you'd be right. But you'd be even more right if you said that each moment was a link in a longer anthropological chain that unites us all (no matter how vanilla our tastes may be) — one that, if traced to its origins, could explain why humans evolved the way we did, and why we needed music to turn out this way.

That is, at least, the thesis of Daniel J. Levitin's lively, ambitious and occasionally even persuasive new book, "The World in Six Songs." Music, Levitin argues, is not just something to help pass the time on road trips anda swell facilitator for meeting girls: it is, he writes,"the soundtrack of civilization" — a force that shaped us as a species and prepared us for the higher-order task of sharing complex communications with one another.

If that sounds like a slightly esoteric argument (and all but unprovable without the use of a time machine), it's also one that Levitin is supremely qualified to make. A musician and former record producer who still pals around with the likes of Sting and David Byrne, Levitin now runs the Laboratory for Music Perception, Cognition and Expertise at McGill University; he covered adjacent turf in his 2007 best seller, "This Is Your Brain on Music." And to the extent that "The World in Six Songs" succeeds, it works much like a great piece of pop music, whose combined elements can induce feelings of enlightenment and euphoria, even when some of the words don't hold up to closer scrutiny.

Levitin divides his book into impressionistic chapters that address the six categories he believes all songs (or at least those possessing lyrics) fit into: songs of friendship, songs of joy, songs of comfort, songs of knowledge, religious songs and love songs. There's a nice parlor-game feel to the book as Levitin sets up these distinctions and the reader tries to figure out which groupings his or her favorite songs belong to. Is the Mothers of Invention's exuberant "Take Your Clothes Off When You Dance" a song of joy or a song of comfort? Is Meat Loaf's "Bat Out of Hell" a love song, or does its cautionary motorcycle-crash conclusion make it a song of knowledge?

The loose boundaries between Levitin's categories, however, can sometimes lead to a certain slackness in his argument. By his own account, Levitin places the Johnny Cash song "I Walk the Line" in three different categories, citing it as an example of a friendship song, a knowledge song and a love song. And his criteria for identifying a friendship song — essentially, any music that helps facilitate, prompt or motivate "synchronous, coordinated" movement — are so broad that '60s protest music and chain-gang laments turn out to be friendship songs, too.

Throughout the book, Levitin builds many hypotheses upon logical if essentially unverifiable extrapolations of evolutionary theory, using it to account for almost any widespread trait in humans or other animals that is beneficial to mating or survival, so that his faith in the explanatory power of Darwinism becomes almost religious. From Levitin's viewpoint, random gene mutation and natural selection can account for everything from a mouse's heightened sensitivity to low-pitched frequencies (to better avoid being pounded underneath the feet of elephants) to mankind's use of drum music in battle (to intimidate one's enemies).

Any and all of this may be true, but Levitin's evolutionary thinking leads him to make some strange claims. Can we really trace our appreciation for joyful music to the evolutionary advantage that optimism provided primitive man in his efforts to pick up primitive women? (And why should a pessimist's negative thoughts "bring about his own destruction" through fighting rather than diplomacy? Isn't an optimist just as likely to throw himself into doomed battle?) And while the humanists among us may wish it so, how can we confirm that natural selection tends to preserve "altruism, fidelity, bonding and those qualities that are all part and parcel of mature love"? Haven't we all met our share of Homo sapiens who have survived just fine without these qualities?

Levitin is on safer ground, and much better able to show off his natural passion and estimable aptitude for writing about music, when he leaves the science behind and shares personal anecdotes that illustrate the pervasive role songs play in our lives. You'd have to be a calcified cynic not to be moved by the tale of the author's grandmother, who arose every morning to sing "God Bless America," guided by numbers taped to a cheap electronic keyboard. And by far the best part of the book is an extended digression in which Levitin recalls the days when he worked as a cook at a pancake restaurant in Oregon and once watched as the restaurant's kindhearted, dimwitted dishwasher attempted to murder his manager in a confrontation incited by the song "Tie a Yellow Ribbon Round the Ole Oak Tree." It is a story that will leave you awestruck at the friendship between the author and his doltish kitchen co-worker; joyful that the incident was resolved without mortal violence; and cursing God, or whatever you believe in, that you, too, did not take a sabbatical to work as a short-order cook and learn to play guitar before you shipped off to college.

Who knew that the world could really be explained in just one song, from the repertoire of Tony Orlando and Dawn?

Dave Itzkoff writes the Book Review's Across the Universe column.

http://www.nytimes.com/2008/08/31/books/review/Itzkoff-t.html?8bu&emc=bua2

Degas's Ballet Students Teach the Lessons of Their Art

By ALASTAIR MACAULAY

In 1955 the art historian Kenneth Clark was visiting a museum in Copenhagen with Ninette de Valois, the artistic director of the Royal Ballet in Britain and the main architect of its style in the classroom. "How beautiful, " Clark remarked as they were looking at paintings and statues of dancers by Degas. Soon he became aware of a severe expression on de Valois's face. Then she said, disapprovingly, "Line!"

That story returned to mind as I recently viewed the endlessly absorbing Degas ballet paintings and sculptures at the Metropolitan Museum of Art. A year ago the Met closed its rooms of 19th-century European painting and sculpture for renovation; I had not revisited them since they reopened in December and had forgotten quite how large their ballet quotient is.

Elsewhere in New York — at the Museum of Modern Art, the Frick Collection and the Brooklyn Museum — there are other famous Degas ballet pictures. One, "Mademoiselle Fiocre in the Ballet 'La Source' " (at the Brooklyn Museum), is the basis for the new Off Broadway play "The Seduction of Edgar Degas" at the 59E59 Theaters in Manhattan through Sunday.

At the Met, though, Degas is the sole occupant of two rooms (one of painting, one of sculpture), the main occupant of two more and is found in two others. Of these six rooms, five include his dancers.

Showing the world of ballet with new kinds of truthfulness, they helped to make his fame during his lifetime. They have never lost their renown, and some grow only more complex with analysis. The relatively simple statuettes, about which Degas liked to speak as if they were not serious, repay multiple viewings. He shows ballet as a world of both idealism and facts.

Even if you've been looking at Degas ballet pictures for decades, it remains astonishing how few of his dancers are actually dancing. The rest are stretching, adjusting ribbons and costumes, waiting in the wings, resting, gossiping or watching what performing there is.

By contrast, in Degas's 1890s paintings of Russian folk dancers, you can't miss that these women are all dancing. Their long sleeves and boots (Degas called this series "orgies of color") are another world from the Paris Opera ballet he had been depicting since 1870. (The Met has just one Russian dancer, from 1899.)

The ballet pictures feature remarkably little pointwork. Even when it occurs, Degas sometimes obscures it. In "The Dance Class" (1874), a single dancer is stepping onto point in attitude. Yet we can't quite see the clinching detail of her toe, for the tulle of another performer's skirt blocks our view.

The proportion of dance content is higher in the room of Degas statues, which contains 25 bronzes of dancers. Most, interestingly, show models in the nude. And three depict women doing the same arabesque penchée; each might have caused de Valois to exclaim, "Line!"

In this position — traditionally the ultimate test of a dancer's line — the dancer, balancing on one leg, leans forward and downward while extending the other leg behind her so that her foot becomes the highest point of her entire body. At first, these three look almost identical, and what's fascinating is that Degas is meticulously recording a kind of penchée that is seldom seen today.

The crucial point is the angle of the torso. Although today's dancers, if raising the leg at that angle, would show the front arm continuing the same downward line, they would hold their torsos at a higher angle (unless supported by a male dancer). These Degas women, however, all conceive penchée — evidently it was the style of the day — as one sloping line that descends from raised foot to front arm.

Another interesting detail is that arm's hand: this doesn't continue the line but is held parallel to the floor, as if drawing the line to its conclusion and saying, "No farther." Today's dancers would almost all show the line pointing downward through their very fingertips.

There are many comparable details of bygone ballet style that Degas catches very precisely, especially in the statuettes. How differently today's dancers use knees (straighter) and hands (more open).

Go on looking at the women in this arabesque penchée and you soon see that Degas is showing the different ways in which three women demonstrate the same line. Of the three, it is the one who is most thick-set (currently positioned to the upper right of the Met's display) whose line seems most attractive. Whereas one of the others can't even quite show us a bodily coherence like a single sure stroke of draftsmanship that flows through torso and arm, she can. And yet it's only she, very visibly, who lets her stomach drop; any teacher would correct her.

In this feature this mature woman resembles the subject of Degas's most famous ballet statue, "The Little 14-Year-Old Dancer," who appears twice at the Met, once small and nude, once almost life-size in costume. Touching though we may find her, Degas is under no illusions concerning how much she has to learn, even about basic stance. Otherwise slim, she lets her stomach protrude. She leans way back in her turned-out fourth position. She's not a dancer yet. Will she ever be? "Line!"

In the three arabesques penchées, Degas seems to be fascinated by the individual flaws of each woman and by the purity of the dance itself. They show us both the principle of absolute beauty and the difficulties of achieving it to perfection. This ideal-reality paradox connects to his paintings, especially those depicting ballet. He seems to have been as interested as his contemporary Ibsen in the tension between the actuality of women's lives and society's expectations. And Degas's women, unlike most of Ibsen's, are almost all workers, even if they are by no means working in his paintings.

Degas remarked, as the choreographer Merce Cunningham has in our own time, that he was drawn to complexity, and several of these ballet pictures show a greater number of different things going on simultaneously than even Mr. Cunningham has been able to manage. In the 1874 "Dance Class" only one

woman is dancing. And amid a roomful of mothers and dancers (most as highly individualized as she), nobody save the ballet master is watching her with serious concentration.

In the foreground a rosebud lies on the floor beside a dancer's foot; it seems to have fallen from her hair, and she may even be treading on its stem. A score is open on a music stand, but no musician is present. In the mirror (at which nobody is looking) the painting reaches its most bewilderingly intricate, and, as it shows the sky outside, its brightest.

The 1870 "Dancing Class" includes a perplexing maze of mirror views. The foreground shows blunt reality: a watering can (water was used to strengthen the floors, like rosin) standing beside an aged violinist's top hat, in which he has placed his folded newspaper, and, next to it, his violin case.

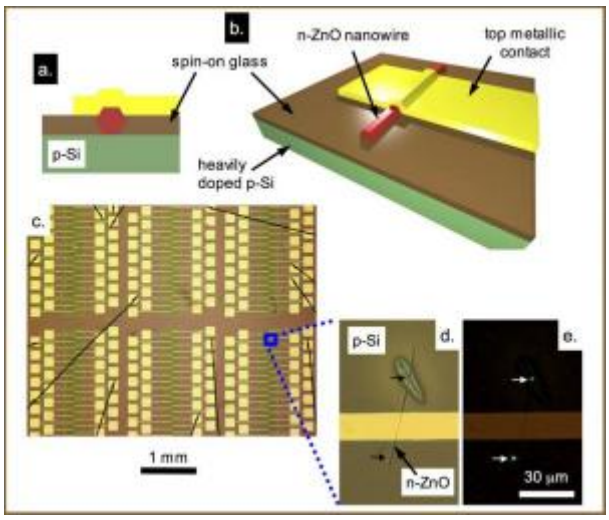
More staggering yet as a composition is the 1884-85 "Dancers in the Rehearsal Room With a Double Bass." We're in the corridor leading into the classroom. The whole left half of the painting is taken up by the double bass, on its side (with the top of another), and the empty wall behind it. The room beyond shows at least eight dancers, yet only one is working on her steps, and part of her is blocked from our view by the wall.

In these paintings Degas takes a "Rosencrantz and Guildenstern Are Dead" view of ballet, seeing it askew, from a distance, at an angle from which it was never intended to be viewed. He probably changed the specifics of any ballet room he visited to fit his idea. The result, paradoxically, is that he gives us a vision we believe wholeheartedly, a truth in which he addresses many layers of being.

Degas paintings and sculptures are in the 19th-century European galleries of the Metropolitan Museum of Art; (212) 535-7710 or metmuseum.org.

http://www.nytimes.com/2008/09/03/arts/dance/03dega.html?th&emc=th

Researchers Develop New Technique For Fabricating Nanowire Circuits



The basic structure of the nanowire devices is based on a sandwich geometry in which a nanowire (n-type zinc oxide) is placed between the substrate (heavily doped p-type silicon) and a top metallic contact, using spin-on glass as an insulating spacer layer to prevent the metal contact from shorting to the substrate (as shown in (a) and (b)). This allows for uniform injection of current along the length of the nanowire. A finished wafer using the team's method is shown in (c), with a typical device shown in (d). Note that a stray nanowire intercepts the device on the upper part of (d). The oval feature surrounding the stray nanowire is due to the varying thickness of the spin-on glass film. When a voltage is applied to this device, it emits ultraviolet light (as shown in image (e) obtained with a CCD camera) with a peak wavelength of ~380 nm. (Credit: Courtesy of the lab of Federico Capasso, Harvard School of Engineering and Applied Sciences)

ScienceDaily (Sep. 3, 2008) — Applied scientists at Harvard University in collaboration with researchers from the German universities of Jena, Gottingen, and Bremen, have developed a new technique for fabricating nanowire photonic and electronic integrated circuits that may one day be suitable for high-volume commercial production.

Spearheaded by graduate student Mariano Zimmler and Federico Capasso, Robert L. Wallace Professor of Applied Physics and Vinton Hayes Senior Research Fellow in Electrical Engineering, both of Harvard's School of Engineering and Applied Sciences (SEAS), and Prof. Carsten Ronning of the University of Jena, the findings will be published in Nano Letters. The researchers have filed for U.S. patents covering their invention.

While semiconductor nanowires---rods with an approximate diameter of one-thousandth the width of a human hair---can be easily synthesized in large quantities using inexpensive chemical methods, reliable and controlled strategies for assembling them into functional circuits have posed a major challenge. By incorporating spin-on glass technology, used in silicon integrated circuits manufacturing, and photolithography, transferring a circuit pattern onto a substrate with light, the team demonstrated a reproducible, high-volume, and low-cost fabrication method for integrating nanowire devices directly onto silicon.

"Because our fabrication technique is independent of the geometrical arrangement of the nanowires on the substrate, we envision further combining the process with one of the several methods already developed for the controlled placement and alignment of nanowires over large areas," said Capasso. "We believe the marriage of these processes will soon provide the necessary control to enable integrated nanowire photonic circuits in a standard manufacturing setting."

The structure of the team's nanowire devices is based on a sandwich geometry: a nanowire is placed between the highly conductive substrate, which functions as a common bottom contact, and a top metallic contact, using spin-on glass as a spacer layer to prevent the metal contact from shorting to the substrate. As a result current can be uniformly injected along the length of the nanowires. These devices can then function as light-emitting diodes, with the color of light determined by the type of semiconductor nanowire used.

To demonstrate the potential scalability of their technique, the team fabricated hundreds of nanoscale ultraviolet light-emitting diodes by using zinc oxide nanowires on a silicon wafer. More broadly, because nanowires can be made of materials commonly used in electronics and photonics, they hold great promise for integrating efficient light emitters, from ultraviolet to infrared, with silicon technology. The team plans to further refine their novel method with an aim towards electrically contacting nanowires over entire wafers.

"Such an advance could lead to the development of a completely new class of integrated circuits, such as large arrays of ultra-small nanoscale lasers that could be designed as high-density optical interconnects or be used for on-chip chemical sensing," said Ronning.

The team's co-authors are postdoctoral fellow Wei Yi and Venkatesh Narayanamurti, John A. and Elizabeth S. Armstrong Professor and dean, both of Harvard's School of Engineering and Applied Sciences; graduate student Daniel Stichtenoth, University of Gottingen; and postdoctoral fellow Tobias Voss, University of Bremen.

The research was supported by the National Science Foundation (NSF) and the German Research Foundation. The authors also acknowledge the support of two Harvard-based centers, the National Science Foundation Nanoscale Science and Engineering Center (NSEC) and the Center for Nanoscale Systems (CNS), a member of the National Nanotechnology Infrastructure Network (NNIN).

Adapted from materials provided by Harvard University, Faculty of Arts & Sciences.

http://www.sciencedaily.com/releases/2008/08/080830165628.htm

Brain Imaging Links Chronic Insomnia To Reversible Cognitive Deficits Without Changes In Behavior

ScienceDaily (Sep. 3, 2008) — A neuroimaging study has found that cognitive processes related to verbal fluency are compromised in people with insomnia despite the absence of a behavioral deficit. These specific brain function alterations can be reversed, however, through non-pharmacological treatment with sleep therapy.

Results of functional magnetic resonance imaging (fMRI) scanning during verbal fluency tasks show that people with insomnia have less activation than controls in the left medial prefrontal cortex and the left interior frontal gyrus, two fluency-specific brain regions. However, participants with insomnia generated more words than controls on both the category fluency task (46.4 words compared with 38.7 words) and the letter fluency task (40.1 words compared with 32.7 words).

"It was surprising to see that the patients performed at a higher level than the control group, but showed reduced brain activation in their fMRI results," said principal investigator Ysbrand Der Werf, PhD, of the Netherlands Institute for Neuroscience in Amsterdam. "The success during the task may reflect a conscious effort to counteract the effect of poor sleep."

Results from post-treatment neuroimaging shows that cognitive abnormalities recovered for insomnia patients who received sleep therapy, but not for those assigned to a wait-list group. Participants in the sleep therapy group also generated more words on the verbal fluency tasks after treatment than members of the wait-list group, although the results did not achieve statistical significance.

According to the authors, these results should encourage the use of sleep therapy in clinical practice as a low-cost, non-pharmacological intervention for insomnia.

The study included 21 chronic insomnia patients with an average age of 61 years and 12 healthy controls with an average age of 60 years who were matched for age, sex and education. Insomnia was defined as "chronic" if it had lasted for at least 2.5 years. Participants underwent fMRI scanning during the performance of verbabal fluency tasks between 5 p.m. and 8:30 p.m.

Insomnia patients then were randomly assigned to a six-week long sleep therapy group or a wait-list group. Therapy involved a combination of sleep restriction, multifaceted cognitive-behavior therapy, morning and late afternoon bright-light exposure and body temperature manipulations. After six weeks, fMRI scanning was repeated on both treatment groups during the same verbal fluency tasks.

Journal reference:

1. . **Prefontal Hypoactivation and Recovery in Insomnia**. *Sleep*, Sept. 1, 2008

Adapted from materials provided by American Academy of Sleep Medicine, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080901084845.htm

New Methods To Protect Wind Generators During Voltage Dips Developed

ScienceDaily (Sep. 3, 2008) — In his PhD, Jesús López Taberna put forward two protection techniques so that wind generators continue to be operative despite breaks in electricity supply

To provide a solution to the problems caused to wind turbines by sudden dips in voltage in a part of the electric grid. This was the objective of industrial engineer and member of INGEPER Research Team at the Public University of Navarre, Jesús López Taberna. The fruit of his research is a rotor model which enables anticipating how the wind power unit will behave in these situations. Mr López has patented two techniques of protection, one of which has already been transferred to a manufacturer who will exploit it at international level. This system allows the generator turbine to remain in operation during these voltage dips and thus prevent the wind energy converter from ceasing to function.

The title of the PhD is: "The behaviour of wind-powered generators with double-fed asynchronous motor during voltage dips".

Over the past few years, the growth and development of wind energy converters has been slowed by problems that have arisen from the increase in the number of these connected to the electric grid. One of the most important problems is precisely the manner in which the wind generators behave during these voltage dips.

A voltage dip is a sudden reduction in potential in the electric grid, followed by a rapid return to its normal value. This, at times, can be caused by lightening or a tree falling on power cables but also due to a large company consuming a lot of energy in one go. This drop in voltage happens in a matter of milliseconds; "we are aware of it because the lights begin to flicker or because they go off and on momentarily – but, for a machine, this can be an eternity", explained Mr López. In fact, an interruption of half a second in a productive process can cause the whole process to block and it may have to be reinitiated.

With wind generators, in the case of a voltage dip, the electronic part of the unit can burn out or otherwise be destroyed, unless a protection system is installed "The current system of protection, known as Crowbar, has the advantage of being able to protect the machine but the disadvantage of the machine coming to a halt", pointed out Mr López. "For example, if a large company suddenly consumes a lot of current, the voltage drops. This causes the wind power units at El Perdon (Navarre) to disconnect and cease producing electricity. As a result, the power dip is even more accentuated and, consequently, it is even more difficult to bring the voltage up to its normal operating value".

Taking into account that, in Spain, there are days that wind-powered energy can account for one third of electricity production, the problem can prove to be a serious one. The idea being worked on currently is focused on the generator behaving more as a conventional power station and not disconnecting during a voltage dip/power failure but helping to bring the grid voltage back up. This is why wind generator manufacturers are currently working on finding a new system of protection that is efficient and efficacious.

Two new protection techniques patented

"Before looking for a solution, the problem has to be studied from a theoretical perspective, i.e. why does this machine behave as it does when there is a voltage dip? And why, if we do not install a protection system, the machine starts to burn out"? The research produced a rotor model which was "sufficiently simple to be able to deal with without having to carry out simulations. A model in which we can see what role each parameter of the machine plays, how they interact, how the current drops if we increase the leak inductances, etc".

Once this model was developed, it was more or less easy to propose solutions. “The most important thing is that we have achieved solutions that enhance the behaviour of the machine without any need to change anything, except the control. It’s like changing the version of a text treatment programme on the computer, without needing to change the PC. There a number of computers inside a wind energy converter and one of these – that which controls the electrical machinery – is the one the control of which we have proposed to modify in order to enhance the behaviour of the machine”.

Jesús López Taberna specifically proposed in his PhD thesis two systems of protection and both have been patented. The first, only requiring changing the control of the machine converter, has been transferred to a manufacturer for introduction into wind parks worldwide; the other requires changing elements inside the machine and continues to be developed for applications in new creation wind generators.

Adapted from materials provided by Basque Research.

http://www.sciencedaily.com/releases/2008/09/080902102534.htm

Baltic States Failing To Protect Most Damaged Sea

The poor state of the Baltic Sea environment has received attention this summer because of the extensive algal blooms caused by eutrophication and for recent scientific reports on the vast "dead zones" on the sea bottom. (Credit: iStockphoto/Janno Vään)

ScienceDaily (Sep. 3, 2008) — Nine Baltic sea states all scored failing grades in an annual WWF evaluation of their performance in protecting and restoring the world's most damaged sea.

The assessment, presented today at the Baltic Sea Festival, graded the countries on how well they are doing in six separate areas - biodiversity, fisheries, hazardous substances, marine transport and eutrophication - and on how they have succeeded in developing an integrated sea-use management system.

The best grade (an F for just 46 per cent) was received by Germany, followed by Denmark (41 per cent) and the worst were Poland (25 per cent) and Russia (26 per cent).

"It is a shame no country could be given a satisfactory total score," said Lasse Gustavsson, CEO of WWF Sweden. "The Baltic Sea is influenced by a multitude of human activities, regulated by a patchwork of international and national regulations and authorities.

"What the Baltic Sea needs now is political leadership that can look beyond national or sectoral interests and take an integrated approach to solving the problems."

Behind the bad overall scores there were some rays of hope. Germany received an A on the biodiversity score for their protection of marine areas with around 40 per cent of the country's sea areas protected.

Latvia and Lithuania have taken measures to combat illegal fishing of cod, partly by giving inspectors the mandate to impose sanctions on site. Estonia has a narrow lead in lowering the impact of hazardous substances.

Also at the festival WWF awarded Tarja Halonen, president of the Republic of Finland, with the Baltic Sea Leadership Award for "her persistent efforts to unite groups and encourage cross-border discussions on the future of the Baltic Sea".

Finland is the only country in the region that has developed a cross-sectoral marine policy and several other countries are now taking steps to review their marine management.

"We now have an opportunity in the area of sea-use management with two current processes on the European level," said Vicki Lee Wallgren, programme manager for WWF's Baltic Ecoregion Programme.

She said initiatives such as the EU's Maritime Policy and the EU Baltic Sea Strategy meant that "there is hope for the Baltic Sea".

The poor state of the Baltic Sea environment has received attention this summer because of the extensive algal blooms caused by eutrophication and for recent scientific reports on the vast "dead zones" on the sea bottom. Seven of the world's 10 biggest dead zones, where nothing can survive due to lack of oxygen, are found in the Baltic Sea.

Adapted from materials provided by World Wildlife Fund.

http://www.sciencedaily.com/releases/2008/08/080830191841.htm

Bowling Alone Because The Team Got Downsized

ScienceDaily (Sep. 3, 2008) — The pain of downsizing extends far beyond laid off workers and the people who depend on their paychecks, according to a new UCLA-University of Michigan, Ann Arbor study.

Even a single involuntary displacement has a lasting impact on a worker's inclination to volunteer and participate in a whole range of social and community groups and organizations, found the study, which appears in the September issue of the international scholarly journal Social Forces.

"What we find is that even just one disruption in employment makes workers significantly less likely to participate in a whole range of social activities — from joining book clubs to participating in the PTA and supporting charities," said Jennie E. Brand, a UCLA sociologist and the study's lead author. "After being laid off or downsized, workers are less likely to give back to their community."

The first study to look at the long-term impact of job displacement on social participation, the research found that workers who had experienced just one involuntary disruption in their employment status were 35% less likely to be involved in their communities than their counterparts who had never experienced a job loss due to layoff, downsizing or restructuring, or a business closing or relocating. Moreover, the exodus from community involvement continued not just through the spate of involuntary unemployment, but for the rest of the workers' lives.

"Social engagement often involves an element of social trust and a sense that things are reciprocal — that you give some support if you get some support, and you benefit from society if society benefits from you," said Brand, an assistant professor of sociology at UCLA. "When workers are displaced, the tendency is to feel as though the social contract has been violated, and we found that they are less likely to reciprocate."

Along with University of Michigan sociologist Sarah A. Burgard, Brand looked at 4,373 participants in the Wisconsin Longitudinal Study, which has tracked a group of 1957 Wisconsin high school graduates for more than 45 years, gathering detailed information on their IQs, education, careers, psychological well-being, family and social lives. Born between 1939 and 1940, the group belongs to what Robert D. Putnam, the author of the 2001 sensation, "Bowling Alone: The Collapse and Revival of American Community," has described as "a cohort of joiners" or an American age group particularly inclined to participate in community and social groups.

Of the six forms of involvement studied by Brand and Burgard, youth and community groups experienced the strongest exodus followed by church and church groups, charitable organizations and leisurely activities, including country club attendance.

For workers who were displaced during their peak earning years — between 35 and 53 years of age — the effects were the strongest. The researchers found that non-displaced workers were 1.2 to 1.5 times more likely to participate across all forms of social and community activities than workers who had been displaced. This was the case for both ages examined by the researchers — 53 as well as at 64 years of age.

"Workers can be displaced early in their career, and they're still less likely to be participating at age 60 than their counterparts who have never been displaced," Brand said. "It's not like displaced workers rebound and return to involvement. Displacement seems to change their whole trajectory of participation."

Professional organizations were the least likely to be affected by a disruption of employment. After finding a new job, displaced workers were more likely to strike up affiliation with these groups than with

youth groups or community centers; civic, business, political, neighborhood or professional groups; or social and leisure activities, including country clubs, sports teams and weekly gatherings with friends, Brand and Burgard found."Displaced workers may be more likely to keep up with professional groups than other groups because they're trying to make up for lost ground with respect to their careers," Brand said.

Affiliation with political groups also showed no statistically significant downturn over time, possibly because the experience of being displaced impressed some workers with the need for political action.

Employees who experienced the disruption during the tail end of their careers were less likely to withdraw than workers who were displaced earlier in their careers. The researchers found no significant difference in social and community participation between workers who were displaced between 53 and 64 years of age and their non-displaced counterparts."Being laid off doesn't appear to be as socially damaging for older workers as younger ones," Brand said. "The shame factor of downsizing your lifestyle just isn't there, because your peers may be downsizing as well and you can play off your displacement as an early retirement even though it may be forced retirement."

The closest that previous research has come to drawing a connection between employment and participation histories compared workers who had tended to jump frequently from one job to the next with workers who had a shorter list of past employers, Brand said. The research found that workers with a turbulent employment history tended to be less involved in their communities than their counterparts with more stable job histories. But the earlier research did not compare the participation records over time of workers who had actually experienced involuntary displacement with those who had not. Neither did it look at the community involvement records of workers before and after displacement, as the UCLA-University of Michigan study does.

"From past research it wasn't clear whether you participated less because you were in a disorderly career or you were in a disorderly career because you were the kind of person unlikely to participate anyway," Brand said.

The latest findings have considerable ramifications, she contended."Whether citizens participate is important for the effective functioning of neighborhoods, schools, communities and democracies," Brand said.Moreover, withdrawing could prolong unemployment by limiting a displaced worker's exposure to contacts that could possibly lead to a new job."If workers withdraw socially after being laid off, then they're experiencing double-jeopardy," Brand said. "They're losing their jobs, and then they're not participating in society, so they're not keeping up with social contacts that might help them find a new job."

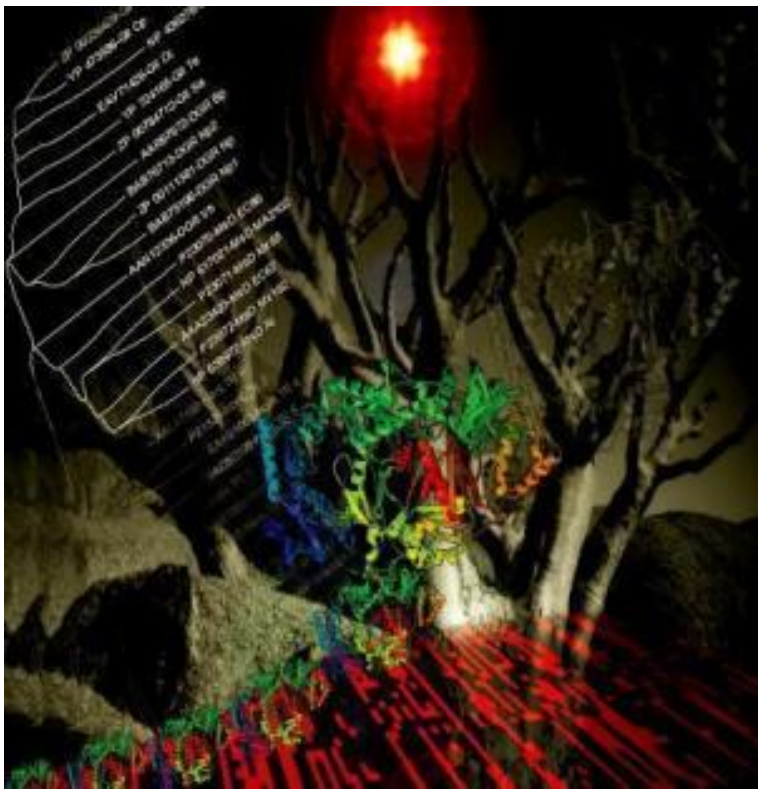
With unemployment at record levels, charities and community groups might need to do a better job of reaching out to potentially displaced workers to make sure they stay involved — both for the good of the organization and for the worker's own good, Brand said. Job loss counseling offered by employers going through restructuring might also do well to take into account the risk of social withdrawal.

"Everybody loses when people withdraw from society," Brand said.

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

http://www.sciencedaily.com/releases/2008/09/080901084849.htm

Scientists Develop New Computational Method To Investigate Origin Of Life



The baobab tree represents one of the most ancient species of life on the planet. Scientists have investigated ancient and highly divergent proteins, called retroelements, whose evolutionary histories hold keys to uncovering the origins of life. (Credit: Randen Patterson and Damian van Rossum, Penn State)

ScienceDaily (Sep. 2, 2008) — Scientists at Penn State have developed a new computational method that they say will help them to understand how life began on Earth. The team's method has the potential to trace the evolutionary histories of proteins all the way back to either cells or viruses, thus settling the debate once and for all over which of these life forms came first.

"We have just begun to tap the potential power of this method," said Randen Patterson, a Penn State assistant professor of biology and one of the project's leaders. "We believe, if it is possible at all, that it is within our grasp to determine whether viruses evolved from cells or vice-versa."

The new computational method will be described in a paper to be published in a future issue of the journal Proceedings of the National Academy of Sciences. The journal also will post the paper on the early on-line section of its Web site sometime during the week ending 6 September 2008.

The team is focusing on an ancient group of proteins, called retroelements, which comprise approximately 50 percent of the human genome by weight and are a crucial component in a number of diseases, including AIDS. "Retroelements are an ancient and highly diverse class of proteins; therefore, they provide a rigorous benchmark for us to test our approach. We are happy with the results we derived, even though our method is in an early stage," said Patterson. The team plans to make the algorithms that they used in their method available to others as open-source software that is freely available on the Web.

Scientists map out the evolutionary histories of organisms by comparing their genetic and/or protein sequences. Those organisms that are closely related and share a recent common ancestor have greater

degrees of similarity among their sequences. In their paper, the researchers describe how they used 11 groups of the retroelement proteins -- ranging from bacteria to human HIV -- to trace the evolutionary histories of retroelements. Their method uses a computer algorithm to generate evolutionary profiles -- also called phylogenetic profiles -- that are compared all-against-all. For example, given four sequences, the new method compares profile A to profiles B, C, and D; it compares profile B to profiles C and D; and so on, for a total of six comparisons. The method then selects the regions of the profiles that match and creates a tree-like diagram, called a phylogenetic tree, based on the retroelements' similarities to one another. The tree provides evolutionary distance estimates and, hence, phylogenetic relationships among retroelements. Patterson said that the results from this study help to clarify many existing theories on retroelement evolution.The conventional method for estimating evolutionary relationships, called multiple sequence alignment, also produces evolutionary trees, but can be insensitive to relationships among the most distantly related proteins, in large part because it makes only one simultaneous comparison across all of the genetic/protein sequences. To obtain more detailed information about possible relationships among the sequences, a human expert who can manually search for such relationships is needed. But Patterson said that relying on humans to do the work is not ideal.

"Although the human mind is the most powerful tool for pattern recognition, human-based measurements often are hard to reproduce," he said. "For example, if you do something and I do something, we're going to do it differently. It's better to have a standardized method for gauging relationships among ancient proteins, and that's exactly what we've created." According to Damian van Rossum, Penn State research associate/assistant professor of biology and another leader on the project, the new method can be used in conjunction with the conventional method to get a clearer picture of the evolutionary histories of proteins. "The more independent measures you have, the better view of the world you can get," he said.In addition to searching for the origins of life, the team also is using its method to simultaneously gather data on the shapes of proteins, their functions in the body, and their evolutionary histories. In another paper, which was published in 2008 in the online journal Physics Archives, members of the team previously had demonstrated that their new method can simultaneously measure all three of these characteristics. "Previously, people have shown that profiling methods can resolve functional and structural differences and similarities between proteins, but to date no one has shown that you can measure evolutionary distances," said van Rossum. "Not only can our method measure evolutionary distances, but it also can measure functional and structural characteristics at the same time."

Patterson said that there are about 30,000 profiles in an online scientific repository that they can use to generate their phylogenetic profiles. He expects that the team's method will become even more powerful as additional sequences are added to this protein bank. In fact, the method already has become more refined in the short time since the team submitted its manuscript to the journal. "We already are producing evolutionary trees with much more detail than what we show in the paper," he said. "In fact, we are surprised at our progress so far in our goal of tracing these histories all the way back to the beginning of life."

This research was supported by the Commonwealth Universal Research Enhancement (CURE) Program, the Penn State Eberly College of Science, the Penn State Huck Institutes of the Life Sciences, and the Searle Scholars Program.

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

http://www.sciencedaily.com/releases/2008/09/080902095106.htm

Heavy Snoring Is An Independent Risk Factor For Carotid Atherosclerosis

ScienceDaily (Sep. 2, 2008) — A new study shows that objectively measured heavy snoring is an independent risk factor for early carotid atherosclerosis, which may progress to be associated with stroke.

In a study of 110 adults, the prevalence of carotid atherosclerosis was 20 percent with mild snoring, 32 percent with moderate snoring and 64 percent with heavy snoring. After adjustment for age, gender, smoking history and hypertension, heavy snoring was significantly associated with carotid atherosclerosis.

"Heavy snorers may be at risk for the development of carotid atherosclerosis, which is the leading cause of stroke," said lead author and study coordinator Sharon Lee, associate professor and director of the Ludwig Engel Centre for Respiratory Research at Westmead Hospital in Australia. "Heavy snorers…should have a review of all their risk factors for vascular disease."

The study is the first to objectively measure and quantify snoring, rather than using a questionnaire, to explore the association between sleep-disordered breathing and carotid atherosclerosis. According to Lee, the high prevalence of snoring in the community means that these findings have substantial public health implications for the management of carotid atherosclerosis and the prevention of stroke.The American Academy of Sleep Medicine reports that habitual snoring occurs in about 24 percent of adult women and 40 percent of adult men. Loud and frequent snoring also is a warning sign for obstructive sleep apnea.

One-hundred-and-ten participants with ages ranging from 45 to 80 years were examined in a sleep laboratory. Volunteers were categorized as snorers and non-snorers with only mild, nonhypoxic obstructive sleep apnea. Participants underwent polysomnography with quantification of snoring, bilateral carotid and femoral artery ultrasound with quantification of atherosclerosis and cardiovascular risk assessment.

A snoring index (the number of snores per hour) and snoring sleep time (the total number of 30-second sleep periods that contained three or more snore sounds expressed in a percentage) were used to categorize participants. Based on results, participants were deemed mild snorers (0-25 percent night snoring), moderate snorers (greater than 25-50 percent night snoring) and heavy snorers (more than 50 percent night snoring).Prevalence of atherosclerosis was related to snoring sleep time in a nonlinear fashion, with a stable prevalence of atherosclerosis below a snoring sleep time of 50 percent but increasing substantially for snoring sleep times longer than 50 percent.

According to Lee, treatments such as weight loss, decreased alcohol intake, oral appliance therapy and continuous positive airway pressure (CPAP) therapy have all been shown to successfully reduce snoring. There are no studies on whether reducing snoring will reverse damage to the carotid arteries.

Journal reference:

1. . **Heavy Snoring as a Cause of Carotid Atherosclerosis**. *Sleep*, September 1, 2008

Adapted from materials provided by American Academy of Sleep Medicine, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080901084842.htm

Infidelity Gene? Genetic Link To Relationship Difficulties Found

Relationship difficulties: researchers have found a link between a specific gene and the way men bond to their partners. (Credit: iStockphoto/Diego Cervo)

ScienceDaily (Sep. 2, 2008) — Scientists at Karolinska Institutet have found a link between a specific gene and the way men bond to their partners. The results, which are presented in the scientific journal PNAS, can lead to a better understanding of such problems as autism and social phobia.

"There are, of course, many reasons why a person might have relationship problems, but this is the first time that a specific gene variant has been associated with how men bond to their partners," says Hasse Walum, postgraduate student at the Department of Medical Epidemiology and Biostatistics.

He stresses, however, that the effect of this genetic variation is relatively modest, and it cannot be used to predict with any real accuracy how someone will behave in a future relationship.

Hasse Walum and his colleagues made use of data from □The Twin and Offspring Study in Sweden□, which includes over 550 twins and their partners or spouses. The gene under study codes for one of the receptors for vasopressin, a hormone found in the brains of most mammals. The team found that men who carry one or two copies of a variant of this gene -- allele 334 -- often behave differently in relationships than men who lack this gene variant.

The incidence of allele 334 was statistically linked to how strong a bond a man felt he had with his partner. Men who had two copies of allele 334 were also twice as likely to have had a marital or relational crisis in the past year than those who lacked the gene variant. There was also a correlation between the men's gene variant and what their respective partners thought about their relationship.

"Women married to men who carry one or two copies of allele 334 were, on average, less satisfied with their relationship than women married to men who didn't carry this allele", says Hasse Walum.

The same gene has been previously studied in voles, where it has been linked to monogamous behaviour in males.

"The fact that the corresponding gene has proved important for similar behaviour in voles makes our findings even more interesting, and suggests that the thoroughly studied brain mechanisms that we know give rise to strong bonds between individual voles can also be relevant to humans", Hasse Walum concludes.

The team hopes that greater knowledge of the effect of vasopressin on human relations will one day give science a better understanding of the causes of diseases characterised by problems with social interaction, such as autism.

Journal reference:

1. Hasse Walum, Lars Westberg, Susanne Henningsson, Jenae M. Neiderhiser, David Reiss, Wilmar Igl, Jody M. Ganiban, Erica L. Spotts, Nancy L. Pedersen, Elias Eriksson and Paul Lichtenstein. **Genetic variation in the vasopressin receptor 1a gene (AVPR1A) associates with pair-bonding behavior in humans**. *PNAS*, Early Edition, 2-5 September 2008

Adapted from materials provided by Karolinska Institute.

http://www.sciencedaily.com/releases/2008/09/080902161213.htm

'Fingerprinting' Helps Make Great Grapes

Genetic fingerprints, now being developed for the 2,800 wild, rare and domesticated grapes in ARS's northern California genebank, will help grape breeders pinpoint unusual characteristics. (Credit: Photo by Jack Dykinga)

ScienceDaily (Sep. 2, 2008) — At about this time next year, nearly all of the 2,800 wild, rare and domesticated grapes in a unique northern California genebank will have had their "genetic profile" or "fingerprint" taken. These fingerprints may help grape breeders pinpoint plants in the collection that have unusual traits--ones that might appeal to shoppers in tomorrow's supermarkets.

Other grapes might be ideal for scientists who are doing basic research.

That's according to Agricultural Research Service (ARS) plant geneticist Mallikarjuna Aradhya. He's heading the grape fingerprinting venture.

The grape collection that Aradhya is fingerprinting encompasses vineyards and screened enclosures, called "screenhouses." It is part of what's officially known as the ARS National Clonal Germplasm Repository for Tree Fruit and Nut Crops and Grapes, in Davis, Calif.

To glean a distinctive genetic fingerprint of each member of the collection, Aradhya uses pieces of genetic material--or DNA--known as microsatellite markers. Eight markers are all that are needed for a genetic fingerprint of more familiar grapes, like close relatives of those already used for making wine or raisins or for eating out-of-hand.

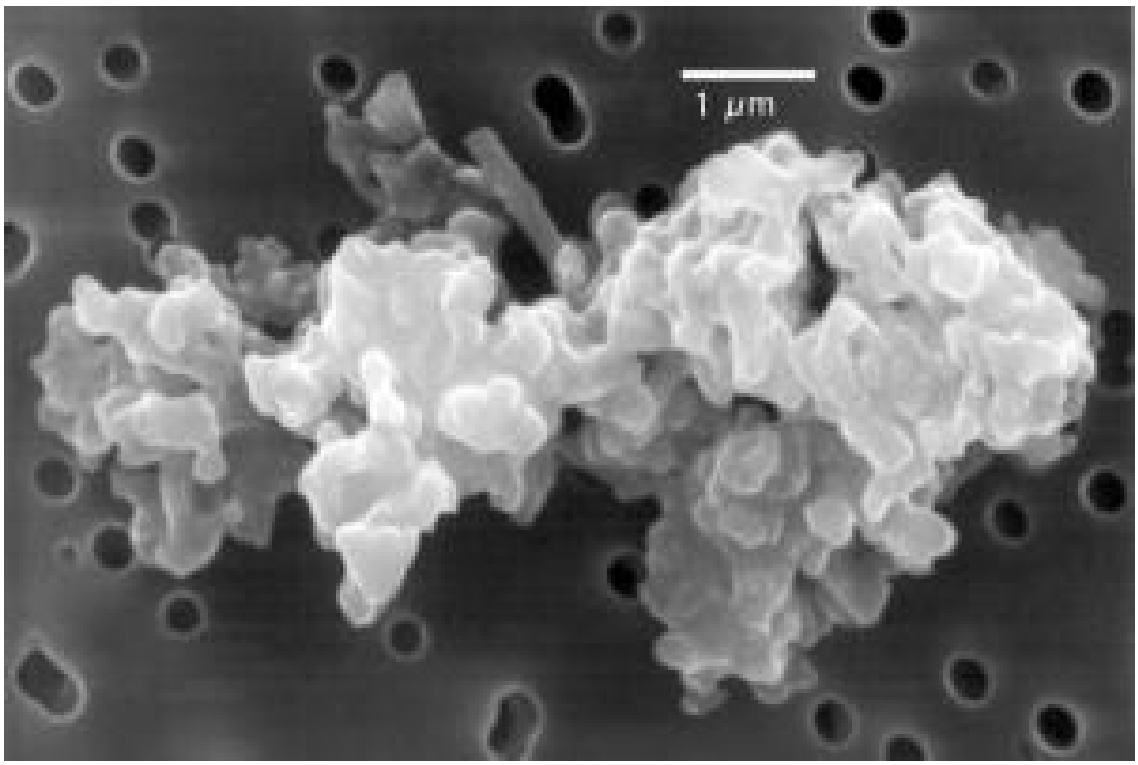
But the lesser-known ones--wild grapes and some prized types from China, for instance--require twice as many markers for reliable identification. That's due, in part, to the fact that the taxonomy, or relatedness of one kind of grape to another, is quite jumbled, Aradhya noted.

He has already fingerprinted 1,100 better-known grapes and 300 wild specimens.

Adapted from materials provided by USDA - Agricultural Research Service.

http://www.sciencedaily.com/releases/2008/08/080830160454.htm

Origin Of Cosmic Dust That Lands On Earth Discovered



Porous chondrite interplanetary dust particle. (Credit: Courtesy of E.K. Jessberger, Institut für Planetologie, Münster, Germany, and Don Brownlee, University of Washington, Seattle (via Wikipedia))

ScienceDaily (Sep. 2, 2008) — The origin of the microscopic meteorites that make up cosmic dust has been revealed for the first time in new research out September 1, 2008.

The research shows that some of the cosmic dust falling to Earth comes from an ancient asteroid belt between Jupiter and Mars. This research improves our knowledge of the solar system, and could provide a new and inexpensive method for understanding space.

Cosmic dust particles, originally from asteroids and comets, are minute pieces of pulverised rock. They measure up to a tenth of a millimetre in size and shroud the solar system in a thin cloud. Studying them is important because their mineral content records the conditions under which asteroids and comets were formed over four and a half billion years ago and provides an insight into the earliest history of our solar system.

The study's author, Dr Mathew Genge, from Imperial College London's Department of Earth Science and Engineering, has trekked across the globe collecting cosmic dust. He says: "There are hundreds of billions of extraterrestrial dust particles falling though our skies. This abundant resource is important since these tiny pieces of rock allow us to study distant objects in our solar system without the multi-billion dollar price tag of expensive missions."

The origin of the cosmic dust that lands on Earth has always been unclear. Scientists previously thought that analysing the chemical and mineral content of individual dust particles was the key to tracing their origin. But this study suggests that a comparison of multiple particles gives better results.

To pinpoint the cosmic dust's origin, Dr Genge analysed more than 600 particles, painstakingly cataloguing their chemical and mineral content and reassembling them like a complex jigsaw. Dr Genge comments:

"I've been studying these particles for quite a while and had all the pieces of the puzzle, but had been trying to figure out the particles one by one. It was only when I took a step back and looked at the minerals and properties of hundreds of particles that it was obvious where they came from. It was like turning over the envelope and finding the return address on the back."

Dr Genge found that the cosmic dust comes from a family of ancient space rocks called Koronis asteroids, which includes 243 Ida, widely photographed by the NASA Galileo probe. The rocks are located in an asteroid belt between Mars and Jupiter and were formed around two billion years ago when a much larger asteroid broke into pieces. Further analysis shows that the dust originates from a smaller grouping of 20 space rocks within the Koronis family called Karin asteroids. It comes from an ancient chondrite rock, common in Karin asteroids, which was formed in space at the birth of the solar system.

Chondrite meteorites often fall to Earth and Dr Genge was able to match the mineralogy and chemistry of the dust particles with chondrite meteorite samples previously collected. He backed up the cosmic dust's origin with infrared astronomical satellite data which showed Karin asteroids grinding and smashing against one another to create cosmic dust.

Dr Genge says his research holds exciting possibilities for a deeper understanding of our early solar system. He concedes that analysing space dust will never entirely replace space missions, but adds that we may not have to visit so many different places.

He concludes: "This research is the first time we have successfully demonstrated a way to locate the home of these important little particles. The answer to so many important questions, such as why we are here and are we alone in the universe, may well lie inside a cosmic dust particle. Since they are everywhere, even inside our homes, we don't necessarily have to blast off the Earth to find those answers. Perhaps they are already next to you, right here and right now."

Journal reference:

1. Genge et al. **Koronis asteroid dust within Antarctic ice**. *Geology*, 2008; 36 (9): 687 DOI: 10.1130/G24493A.1

Adapted from materials provided by Imperial College London.

http://www.sciencedaily.com/releases/2008/09/080902075227.htm