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City's smaller cultural institutions join to boost profile

By Charles Storch

Tribune reporter

February 13, 2008

Jaroslaw Hankewych finds few maps of Chicago's cultural attractions that pinpoint his Ukrainian National Museum.

"The maps stop at Ashland Avenue. Everything west of Ashland apparently doesn't exist," said the president of a museum that has existed for 36 years beyond that cultural border, in Ukrainian Village.

Other area ethnic museums and heritage centers feel they, too, are on the wrong side of some arbitrary line -- whether it be geographical, financial or programmatic -- that consigns them to the cultural hinterlands. To fight this perception, and with confidence there is strength in numbers, 21 of them, including the Ukrainian National Museum, have banded together to form the Chicago Cultural Alliance.

"A lot of people in Chicago have no idea there are little jewels of ethnic museums all over the city," said Kerstin Lane, the alliance's board president. "When these museums can go out and tell the city, state and others, 'We exist,' then each of them will be strengthened.

Building relationships

"The big guys in Chicago" -- the 10 institutions on Chicago Park District land -- "have their Museums in the Park," said Lane, former head of the Swedish American Museum Center, an Andersonville neighborhood fixture and alliance member. Though the small museums can't compare in clout, she said, "we can still get together."

The alliance was formed last year, but it will announce itself at an event set for Friday morning in the Chicago History Museum.

The History Museum is one of the alliance's partner institutions, along with Jane Addams Hull-House Museum and the Field Museum.

The Field has been the alliance's midwife. For a decade, its Cultural Connections program has helped area ethnic museums and cultural centers collaborate on programs, providing an anthropological context to their cross-cultural dialogues.

Value of an alliance

The pairing could be unusual, as when the Balzekas Museum of Lithuanian Culture and the Korean American Resource and Cultural Center explored appearance and identity in their respective cultures.

"There was a lot of relationship-building," said Rosa Cabrera, public involvement manager for the Field's Center for Cultural Understanding and Change, which runs Cultural Connections.

Those relationships led the museums to see the value of an alliance. But it took years before the alliance took form, largely because some museums were so thinly staffed they couldn't spare people to attend all the planning meetings.

"The partners realize by uniting they could have a stronger voice in Chicago" on such matters as tourism, school curricula and funding, said Cabrera.

Pragmatism

Jan Lorys, director of the Polish Museum of America, said the alliance may be able to demonstrate how much its members contribute to the local economy.

"You need one voice saying this," he said.

"In this city, it has to be a dollars-and-cents argument."

Lorys' museum, in the city's West Town neighborhood, dates to 1935; some alliance members are just a few years old. Some members have their own buildings, permanent collections and full-time staffs. Others operate out of private homes and rely on volunteers to help present programs around the city.

Some have operating budgets so minuscule they can't qualify for grants from public and private funders. Lane said foundations may find it more efficient to channel grants through the alliance, which is seeking tax-exempt status from the Internal Revenue Service.

Chicago's Joyce Foundation has given $30,000 to allow many alliance members to undergo an assessment by the Arts & Business Council of Chicago of their skills and needs.

Some museums see the alliance as an opportunity to pool resources. Maria Drell, who runs the Brazilian Cultural Center of Chicago out of her home, said she is talking with two other nomadic groups, the Chicago Japanese American Historical Society and the Filipino American Historical Society of Chicago, about finding a permanent space to share.

Others look to partners for inspiration.

Charles Daas, director of the 4-year-old Cambodian American Heritage Museum, said he has studied the Swedish American Museum's Children's Museum of Immigration as a possible model for a program at his Albany Park institution.

Sherry Williams, who runs the Bronzeville/Black Chicagoan Historical Society from her Pullman home, said she enjoys meetings with other alliance representatives.

"I get to tap their brains on what works and what doesn't," she said. "And I get to socialize with every nationality in Chicago."

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Broad membership

Chicago Cultural Alliance members (addresses are in Chicago, except where noted):

American Indian Center, 1603 W. Wilson Ave. 773-275-5871; aic-chicago.org

Arab American Action Network, 3148 W. 63rd St., 773-436-6060, aaan.org

Balzekas Museum of Lithuanian Culture, 6500 S. Pulaski Rd., 773-582-6500, lithaz.org/museums/balzekas

Brazilian Cultural Center of Chicago, 6342 N. Lakewood Ave., 312-404-7180, braziliancultural center.org

Bronzeville/Black Chicagoan Historical Society, 11431 S. Forrestville Ave. #1, 773 291-9115, bronzevillehistoricalsociety.com

Cambodian American Heritage Museum, 2831 W. Lawrence Ave., 773-878-7090, cambodian-association.org

Casa Aztlan, 1831 S. Racine Ave., 312-666-5508, casaaztlan.org

Chicago Japanese American Historical Society, cjahs.org

Filipino American Historical Society of Chicago, fahsc.org

The History Makers, 1900 S. Michigan Ave., 312-674-1900, thehistorymakers.com

Indo-American Heritage Museum/Indo-American Center, 6328 N. California Ave., 773-973-4444, indoamerican.org

Institute of Puerto Rican Arts and Culture, 3015 W. Division St., 773-486-8345, iprac.org

Irish American Heritage Center, 4626 N. Knox Ave., 773-282-7035, irishamhc.com

Italian Cultural Center at Casa Italia, 1621 N. 39th Ave., Stone Park, 708-345-5933, casaitaliachicago.net

Korean American Resource and Cultural Center, 2701A W. Peterson Ave., 773-506-9158, chicagokrcc.org

Mitchell Museum of the American Indian, 3001 Central St., Evanston, 847-475-1030, mitchellmuseum.org

Polish Museum of America, 984 N. Milwaukee Ave., 773-384-3352, pma.prcua.org

Swahili Institute of Chicago, 10707 S. Hale Ave., 773-785-1430 Swedish American Museum Center, 5211 N. Clark St., 773-728-8111, samac.org

Ukrainian Institute of Modern Art, 2320 W. Chicago Ave., 773-227-5522, uima-art.org

Ukrainian National Museum, 2249 W. Superior St., 312-421-8020, ukrainiannationalmuseum.org

Source: Chicago Cultural Alliance

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http://www.chicagotribune.com/features/lifestyle/chi-0213culturalfeb13,1,4564911,print.story

Is that a cello on your shoulder?

Sigiswald Kuijken argues that the baroque cello was actually a tubby viola

TAMARA BERNSTEIN

From Wednesday's Globe and Mail

February 13, 2008 at 5:19 AM EST

If you've ever seen the opening sequence of Woody Allen's 1969 film *Take the Money and Run*, in which Allen's hapless character attempts to play the cello in a marching band, there will be no doubt in your mind that this particular instrument is played sitting down.

But Sigiswald Kuijken begs to differ, as far as the baroque cello is concerned - and nobody is laughing.

Kuijken, who turns 64 on Saturday, is one of the pre-eminent figures of the period-performance movement. In the late 1960s, in his native Belgium, he single-handedly revived the baroque violin, with only historic sources and his musical instincts to guide him. Kuijken is in Toronto this week to conduct Tafelmusik in symphonies by Haydn and Mozart. But he will also give what is likely the Canadian premiere of a Bach suite for solo cello performed on the instrument for which Kuijken believes these works were written: the *viola* (or violoncello) *da spalla*.

"*Da spalla"* means "played on the shoulder" - that is, like a violin or viola - as opposed to the instrument being held between the legs. "What we today call the baroque cello," Kuijken explained in a conversation Monday, "might be a neologism" - that is to say, it did not exist.

That is a bombshell. The period-performance movement has treated the baroque cello as essentially the same instrument as a modern cello, only with gut strings and lighter "accessories" (bridge, tailpiece). People knew vaguely that something called the *viola da spalla* existed, but it was like the Sasquatch, or more accurately, the elephant in the period-performance room: something that didn't fit in with modern ideas and tastes, and was therefore ignored.

But around 2004, Kuijken began researching the *viola da spalla*, intrigued by its persistent appearance in baroque paintings and music treatises. He now believes that the instrument we now call the cello only came into being in the rococo period. Before that, instruments from the diverse bass viol family - not the cello -- played bass lines in baroque music; the *viola da spalla* was used for solo cello parts, such as the violoncello piccolo solos in Bach's cantatas.

So how does Kuijken account for surviving cellos by Stradivarius and other great makers of the 17th and early 18th centuries?

"I mistrust all big-name instruments," Kuijken says. "This hagiography of famous Italian makers - it's all romanticism. I don't believe that there is one single "Stradivarius" violin. It might exist, but there is no reason to accept that it does [just] because Mr. So-and-So says it is one."

Kuijken recalls a gorgeous set of "17th-century" viols that he used to gaze at in a Brussels museum as a child. Dendrochronology, he says, "has now proven that the tree from which the instruments were made was cut down in 1880!"

In 2004, Kuijken commissioned a luthier to make him a *viola da spalla*, based on museum instruments. It's adorable: a pint-sized cello, or a large, tubby viola. A strap holds it around the neck - perfect for street musicians. It's tuned to the same pitches as a cello; when Kuijken played the opening of a Bach cello suite on it, the sound was lovely: sweet and round.

"What you feel first of all," Kuijken said, "is that all of these pieces seem normal; they come into their own state of being [on the *da spalla*].... Some chords you can hardly [play] on the cello: on the *spalla*, you play them comfortably with violin fingerings. I have not one-third of the shiftings that cellists have when I play these pieces. It's so natural - very easy!"

It's too early to say what effect Kuijken's theories will have on the baroque cello world. But Kuijken, a musician of rare refinement and integrity, is always worth hearing, on any instrument and on the podium.

Special to The Globe and Mail

http://www.theglobeandmail.com/servlet/story/RTGAM.20080213.wclassical13/BNStory/Entertainment/?page=rss&id=RTGAM.20080213.wclassical13

First 'Howl' Recording Found in Oregon

By Associated Press

11:08 PM CST, February 12, 2008

PORTLAND, Ore.

What is believed to be the first recording of Allen Ginsberg reading his iconic Beat poem "Howl" has been found at the library of a private college here.

For years, it has been thought that the first recording of Ginsberg reading "Howl" was on March 18, 1956, at a performance in Berkeley, Calif.

But researcher John Suiter has found a recording at Portland's Reed College that predates that by a month, The Oregonian newspaper reports.

Suiter was at the college library in May to research a biography of Gary Snyder, a poet who grew up in Portland, graduated from Reed and was a friend of Ginsberg.

On Feb. 13, 1956, Snyder and Ginsberg read to about 20 people at Reed, and on Feb. 14, they gave another reading that was recorded on tape. At both readings, Ginsberg read a version of "Howl," a few months before publication of the poem that was to make him famous.

At Reed's library, a special collections assistant brought Suiter a box marked "Snyder Ginsberg 1956." In that box he found a 35-minute tape of Ginsberg reading the first section of "Howl" and seven other poems.

"It was completely serendipitous," Suiter said. "I had no idea there was a tape."

Reed has put the recording of "Howl" and the other poems on its Web site (http://www.reed.edu) but it won't be accessible until Friday, when the issue of Reed magazine with Suiter's article is published."Howl," which was the subject of a landmark obscenity trial after its publication, has sold more than 1 million copies over the past five decades.

http://www.chicagotribune.com/entertainment/sns-ap-portland-howl,1,7614260,print.story

No Windows, No Heat, No Staff, No Rent. This Is a Gallery?

By RANDY KENNEDY

The real estate listing would read something like this: Approximately 800 square feet, ground floor, no windows, no heat, no drain pipe under the sink (slop bucket required), constant traffic noise, fine coating of black gunk on everything.

It paints a nice portrait of a squat or a crack house. But what it actually describes is Chelsea's newest gallery space, which opened its doors on Friday right around the corner from Matthew Marks and other elegant high-dollar galleries. And while the new addition might look like hell by comparison, a small group of New York artists sees it as a kind of paradise, one they know will soon be lost.

Called Honey Space by its creator, the gallery has sprung up in one of the last unused (and as yet undeveloped or demolished) old warehouses in the booming, polished Chelsea art district. No rent is paid by the gallery. There is no sign. The door on 11th Avenue between 21st and 22nd Streets looks a little like a breach in the wall. The gallery will generally keep Chelsea hours, open Tuesdays through Saturdays. But most of the time there will be no one attending it. (The security gates will be lifted in the morning and lowered in the evening.)

If you like the art inside, you can call the artist's phone number on the cards lying around. You could also steal it. But the people involved with the gallery hope that you appreciate the cultural value of this little eddy in the rushing stream of development that has all but swept away such scrappy artists' spaces in Manhattan.

"Free space to show art anywhere is amazing," said Thomas Beale, the 29-year-old artist who founded the gallery and has made his studio in the building for more than a year. "But for it to be in Chelsea is just crazy. And we know it."

"The fact that I had a ground-floor space just made me start thinking that it was this amazing opportunity to have a gallery, even though I don't really have any desire to run a gallery," he said Friday morning, after a party the previous evening to inaugurate the space left it scattered with Captain Morgan rum

bottles, a stray accordion and a near-frozen fondue pot. ("We have some peppermints left over, but the fondue I don't think we should touch," said Adam Stanforth, a friend of Mr. Beale whose acrylic-on-Masonite paintings make up the gallery's first exhibition, "Still Reaping," which runs through March 15.)

Mr. Beale calls his creation a no-profit gallery, perhaps because nonprofit sounds far too official for a space where you can see your breath on a winter morning. Alf Naman, a longtime Chelsea real estate developer and broker who controls the property, has allowed Mr. Beale and several other artists to colonize the four-story building over the last few years, converting spaces that had once housed deep storage and a well-known gay bar into raw studios and places to show their work.

A plan to weave the building together into a more organized, environmentally conscious artists' cooperative called Emergency Arts fell apart because it was growing too unwieldy in the view of Mr. Naman, who has development plans for the property.

But last year Mr. Beale began exhibiting his own work, biomorphic-looking sculptures made from found wood, in his ground-floor space. And this year, when he proposed showing other artists' work and opening the doors to the space as a kind of autonomous gallery, Mr. Naman agreed.

"The idea is that we've got all this empty space, and we really just don't want to lie fallow," said Mr. Naman, a partner in a nearby condo tower that is being designed by the architect Jean Nouvel. "We want to give back something to the art community. Any kind of space in Manhattan these days for artists is just so hard to come across and so expensive."

Mr. Beale still finds it all a little hard to believe. "Besides no rent, I've never paid an electric bill and haven't even given Alf any art yet," he said. But he knows there is an expiration date on this kind of luck. "Through this whole thing there's this constant feeling that it could all go away very soon. And we know it will."

Until it does — Mr. Naman said it could be another year or two — Mr. Beale will continue to plan exhibitions of his friends and emerging artists whose work he likes. He said he put $6,000 of his own money into the space to bring the electricity up to code. Should the artists sell any work, he asks them only to reimburse him for any of the costs he incurred in mounting the exhibition.

While the shows are up and running, he will usually be on the other side of a wall, working on his own art. Or being the building's Mr. Fix-It, as he was Friday morning, carrying a drill upstairs to screw shut the door of a badly backed-up bathroom. Or making lunch in his studio in the kitchen he built from the ruins of an old one that once existed in the building. Another part of the ground floor, on the corner of 21st street, was the former location of the Eagle, a gay men's leather bar.

In the first few hours of Honey Space's first day on Friday, business was slow. A delivery man wandered in to leave Chinese food menus, looking very confused. A well-heeled woman in a bright-red coat came in with her dog, smiled politely and left. Two documentary filmmakers, Laure Flammarion of Paris and Arnaud Uyttenhove of Brussels, stumbled across the space. They came in slowly, apprehensively, emerging from the small entry hall that Mr. Beale and Mr. Stanforth had built and lined with dried morning glory vines and gauzy drapes, like something from a set for "A Midsummer Night's Dream."

Told that the gallery was called Honey Space, Ms. Flammarion nodded appreciatively. "I like it," she said. "So that means that we are the bees, yeah?"

Honey Space is at 148 11th Avenue, between 21st and 22nd Streets, Chelsea; honey-space.com

http://www.nytimes.com/2008/02/18/arts/design/18gall.html?ref=arts

DANCE REVIEW | NEW YORK FLAMENCO FESTIVAL 2008
Women of Flamenco Expand the Edges of Passionate Tradition

By JENNIFER DUNNING

Flamenco is an art of fiery passion, as everyone knows. Its dancing feet are soul-shattering, its singing voices gut-wrenching. To renew or refashion flamenco, a little Latin influence is added here or an involved narrative there. But the four women who starred in “Mujeres” (“Women”), a gala program presented by World Music Institute’s New York Flamenco Festival 2008 on Friday at City Center, offered stunning proof that the old art lives on most vitally in committed new interpreters.

Hard-driving, beautifully articulated footwork was represented in “Mujeres,” though the subtlety of the sounds was too often lost in the show’s heavy-handed electronic amplification. But what the featured artists demonstrated, in a dance event that promises to be one of the most exciting and thought-provoking of the year, was that flamenco is also an art of inflection.

The seguiriya “Apasionado,” performed by Rocío Molina, and the paso a dos "Romance de Zaide, ” danced by Ms. Molina and Belén Maya, did not look like traditional flamenco. “Deja de Volverme Loca,” sung by Diana Navarro with delicate piano accompaniment by Chico Valdivia, had the haunting tenderness of a broken-hearted lullaby, its power very different from the raw scorched-earth sound of singing on most flamenco programs.

Yet the body lines, the reach of the voice, and the pushing, seething impulse to action immediately identified the three pieces as flamenco. And each required training in flamenco substantial enough to enable imaginative, gifted performers to depart from more stereotypical fare.

Ms. Molina, a 23-year-old veteran of festivals and Spanish dance competitions, is already an impressively authoritative star. Early on she stood out for the odd, small-handed cupping gestures that often finished a large and rippling dance for her arms. Hands and suitably fiery feet were at work in her seguiriya. But the core of her solo was a sustained buildup that was spellbinding, a term I’ve resolutely stayed away from for three decades. At one point Ms. Molina stopped suddenly and briefly, seeming to draw the movement into her small, compact body rather than dancing it out. The centered body appeared soon after to tilt momentarily into some implacable wind.

The paso a dos could have been performed on a modern-dance program. Ms. Maya and Ms. Molina, dressed in body-hugging gray stretch fabric, could have been Elie Nadelman maquettes come to life, in an

unspooling thread of jutting, twining, darting encounters for two stretched flamenco bodies. Sensuous, even a little playful, the duet was filled with small continuing surprises. (The evening's choreography was credited to the three dancers and Manuel Liñán.)

Merche Esmeralda was the evening's quiet, towering central dancer, a performer of great dignity who was also willing to throw herself into arm-snaking despair. Mario Maya directed the gala.

The New York Flamenco Festival continues through Sunday at the Skirball Center, 566 La Guardia Place, Washington Square South, Greenwich Village; (212) 279-4200 or worldmusicinstitute.org

http://www.nytimes.com/2008/02/18/arts/dance/18flam.html?ref=arts

American Theater: Not Dead Yet? A Seattlest Debate

Is live theater still relevant in a society where computer users can create high-quality video and distribute it almost instantly via the web? That's been the subject of an ongoing, rancorous debate between two Seattlest contributors, Jeremy and Charles, both former theater artists. Jeremy maintains the theater can yet be a powerful art form -- Charles feels it's a dying, irrelevant medium (most likely wounded by its own hand). To stir them up appropriately, the two were sent to see Mike Daisey's newest monologue, How Theater Failed America, *at CHAC last Friday. What follows is enough to make Michael Vick's knees tremble.*

Jeremy: You know, I find it kind of funny: for a show about how theater screwed up, there was very little discussion of how theater is relevant. Mike Daisey seemed to concentrate exclusively on one aspect of the U.S. theater industry--the big regional theaters, like Seattle Rep or the Oregon Shakespeare Festival--and blamed them for their strange business choices. Not that he doesn't have a point, but it seems to dodge (or presuppose) the question: what does theater do that's so important? I have my own thoughts on the matter, but really, Daisey seemed to take it as a given.

Charles: He did take it as a given. But he's that breed of theater artist who should be doing theater because I don't think he could live without being onstage. Did you read his piece in The Stranger? He Believes in Theater. For him, there is no question that it can be relevant if those in charge can change their tactics.

But what Daisey was talking about was the failure of one type of theater to grow sensibly. While that may be true, I never looked to regional theaters to create any kind of stupendous, ground-breaking art. If he hopes to save the business model, or at least to convince others to try to, good for him. But I don't think there is much chance of success or point because as he himself said, "Theater cannot be commodified." To me, that means he understands that the art of theater can't be easily packaged and distributed. Though art doesn't have to be a commodity to be successful, it does have to be packagable and deliverable to an audience. It's going to take a lot more than lowering ticket prices and tearing down the "wall" between theater administrators and theater artists to do that, which seemed to be the ideas he has for saving theater.

I'll say one other thing that stuck with me. At one point, he talked about how we were all there that night looking for something that is "hopefully kind of rare." That, I think, gets exactly at what makes theater less and less relevant. If a show runs six weeks, almost every performance will be for audiences looking for that "rare" night when all the performers are "on," the house is full and the energy is running rampant. But only one or maybe two nights will provide that experience, leaving 95 percent of those who see the show getting less than the full experience. Is that worth saving?

Jeremy: Yeah, I have no real concern for the fate of regional theaters, per se, either. It almost felt like he was setting up a strawman argument: regional theaters were founded on a decent premise, blah blah blah, but they strayed from the path and are failing. Who cares? That's business. I think it was disingenuous of him to mock Americans' preoccupation with how much better Europe does by its artists, and then to make

some sort of community argument for the value of theater and how we should support it under X, Y, and Z circumstances.

Most theater *businesses* fail and always have; that's irrelevant to art. Most rock clubs, music labels, and art galleries fail, too. If we were to take his title as his thesis, how the theater failed America is that it failed to achieve some perverse business/artistic synergy to both be part of the local community and at the same time comment and add to it, which is, in the end, nothing but either hippie crap or grotesque "run an arts organization like a private business" management theory. Neither interests me, and neither actually touches on your criticism: namely, that the theater is unpopular because it's irrelevant.

Daisey seemed to dance around the point with his joking bit on ticket prices, about how the theater managers worried that if they lowered the tickets in a meaningful way, people still wouldn't come. He never offered any defense of the art itself, that it could draw people in on its own merit. And this, apparently, was meant to contrast the regionals and the weird Seattle "garage theater" (by which I assume he meant both low-budget and fringe) that he did.

I'm sorry, but perhaps the reason people don't give a shit about the theater in general is that self-righteous artists like him are more concerned about how weird they can make jacking-off in Jean Genet's *The Balcony* (which is one of my favorite plays) than anything else. In fact, I grew fed up with Daisey because he doesn't touch on anything relevant. Maybe he should take a hard look at his own work in the past and ask if he really did anything worth seeing, because I have my doubts. Maybe it's the self-absorption of spotlight huggers like Daisey that's wrong with the theater, a fault that can be duly distributed across the fringe and regional theater worlds, all the way up to Broadway. Now that'd be a critique!

Charles: Well I think we can agree that Daisey wasn't talking about what we were talking about re: the relevance of theater, though it definitely sounded as if he were going to. I realized that he wasn't going to be pointing out the real failings of theater (at least as I see them) near the end of the first "scene" when he laid the blame for theater's failure of America at the feet of the audience. Speaking to an audience filled with Seattle theater insiders, it sounded at that point like he might believe that theater has become irrelevant because of all the onstage masturbation (literally and figuratively) that goes on in the theater. But he really blamed those people for not beating off onstage *enough* in an effort to sell season tickets.

How surprising is that though, coming from a man whose "art" is just this side of stand-up comedy? One-man shows are all well and good, but if every single one is just a sweaty guy sitting at a desk telling stories, is it really theater? When I consider the actors I've known in my life, I'd say his dream is about par for the course with theirs, and that's why theater is now irrelevant in my book. When you put a person (or even a bunch of them) onstage and let them say and do whatever they want, the point is for the audience to listen and then clap in all the right places, nothing more. When people create other forms of art these days, a dialogue is a required part of it. There's no room for that in theater.

I imagine when Daisey got down to it, blaming his behind-the-desk masturbation for the death of theater in America ended up hitting too close to home. Ironically, Daisey is a successful force in theater these days because he has commodified and packaged his product. (In fact, really the only theater work Daisey has done that has made a larger impact on the world did so because of its existence on YouTube.) As you

say, he should take a good, hard look at what he does and the relevance it has. If his monologues can't help the business of theater save itself, can anything?

I'm curious though, since we both seem to agree that this show's thesis misses the mark, do you still think American theater, in any form, can add anything to our cultural conversation?

Jeremy: Oh, absolutely. I really do. Theater is very different from film (to say nothing of visual art and literature), and it has a set of unique tools it can use to explore our culture. Personally, what I find so compelling about the theater is that it's not nearly as manipulative as I think film is. Film does the seeing for the viewer; the camera becomes the viewer's eye. And it feels for the viewer, too, with soundtracks and cinematic devices. But you can't control what people look at on the stage (one of the reasons a lot of theater isn't very good--it's really hard to do well!) and you certainly can make audiences feel a certain way just by playing a cheesy pop song.

One of the shows I've seen in the last few years that's really stuck with me is a great example of this: *My Name is Rachel Corrie*. Corrie was Evergreen College student who went to the Palestinian territories and was killed by an Israeli bulldozer back in 2003. The play was intended to be a fairly didactic one-person show that humanized the Israeli-Palestinian conflict and made the ethical case for supporting the Palestinians, and really shouldn't have been very good.

But what was so compelling was precisely how the show *failed* to make its black-and-white point. Based on Corrie's journal entries, her increasingly cynical, "on message" politi-speak kept creeping in to what she wrote, and therefore what the actor was left to work with. It stopped being a story about some naive innocent with good intentions getting murdered (how her story was played in the sympathetic media) and became a story of a savvy political activist trying to manipulate the media to her side's benefit.

I don't think any film would have managed to fail quite so spectacularly to make its political point. On the stage, the only person we see is Corrie; her experiences are relayed in writing, and at least I felt by the end that she was an unreliable narrator of her own life. Any film would predictably feature lots of lingering shots of extreme poverty and desperation in the West Bank or Gaza, in hyper-saturated color and with a soundtrack of swelling symphony. But on the stage, left to confront only Corrie's own words, the audience can't be browbeaten with emotional firepower into an uncritical sympathy for the Palestinians and for Corrie. It may not have been intended by the authors of the play, but the end results was an ambivalent, challenging work and a complex, multidimensional character that, in fact, rose above the Israelis vs. Palestinians rancor that followed the show to the Rep.

And that's just one example, and a fairly simple one. The point is, the theater has unique tools at its disposal, and while I don't dispute that most theater artists ignore them or, at best, apply them poorly, that's a far cry from asserting the entire field has reached its zenith and is on the wane.

Charles: Except that with a show like the one you mention, I was not and can never be touched by it because I did not see it. Your point about cinema "seeing" for you and more easily manipulating your emotions is well taken, but I think that the conservation that can be had around a movie or a book or a blog by definition makes it that much more relevant. All of those forms can be translated onto the Web and into our homes. Theater never can be, and that's where I get lost.

It's interesting that the show you cite as an example is one-person show because I was thinking about what theater has made an impression on me. Short of the glamor of a re-make of *Guys and Dolls* I saw on Broadway when I was in college, the best have been one-person shows. There is still something about the power and vitality of one person alone on a stage telling his or her story. But then, that can be transfered with relative ease to the screen and I can talk about it from my office, can't I?

Jeremy: Good live music can't be easily translated into a form for the office or home, either--I welcome you to suggest as much and get the music community on my side. Some things you just have to go see to really experience, and people do go out to lots of live events. *My Name is Rachel Corrie* drew in a fairly diverse audience, particularly compared to most of the plays I attend, which are filled with graying heads.

It touched on something, and if we had more theater like that, we'd have more people interested in the theater. As it stands, I think the only reason the Rep put it on was its pedigree (West End and Broadway) and its local angle.

As for one-person shows, you're absolutely right: there is power and vitality to just having one person standing up on the stage and saying something. But I think that's because it eliminates the so-called "willing suspension of disbelief." Too many of the ensemble plays staged in Seattle are more or less in the realist mode, and I'll give you that film does that much better than theater. Personally, I prefer theatrical events, shows that are aware of the limitations of the stage and play with it.

One-person shows do that, but plenty of other theater does, too, and it translates poorly to the screen.

Tony Kushner's *Angels in America* is a great example--his use of the same actors playing multiple characters (and the way he uses those choices to create a dialogue) works on the stage, but just wasn't that convincing in the HBO miniseries. Its fidelity to realism either made it feel awkward and incomprehensible, or the make-up and costuming was so good you really didn't see characters X and Y as they same person, which also hurt the dynamic he was creating through those choices.

Charles: Totally true on live music, but I don't go see shows to hear the band's take on life. I go to hear the music at exceptional volumes and the energy of it being played live. To get their "art" or "comment" I throw on the CD and take in the songs over and over again.

Here's to tearing down the strictures of theater, but instead of relying on *Angels in America* or *Rachel Corrie* to do it, I say, take the form and move it out of the bounds of the proscenium or at least tear the script into shreds and try something new. Theatrical events, site-specific theater and street theater can take one to wonderful places because they are surprising and vibrant and involve the audience in the performance without turning into some kind of weird 60s-era thing where people are dragged onto stage and made to strip to their underwear. (Though I did once show my bellybutton to an audience for a dollar when I saw *Too Much Light Makes the Baby Go Blind* at the Empty Space in the mid-'90s.)

Jeremy: Isn't that dangerously close to the sort of theater Mike Daisey talked up? That we agreed verged on the irrelevant? I'm not trying to make a blanket statement on it--some is good, some is bad, and it is being done and many people enjoy it. It's not all weird for the sake of being weird. Could we use more? Possibly. If it's good. Otherwise, what's it contributed? As for street theater put to the benefit of political protest or the like, I find that more often than not just plain tiresome. My point about plays like *Angels in America* or *Rachel Corrie* is that there *are* plays in a more traditional mode being written and performed which are relevant, which present complex subjects and problems that are deeply important to our lives. And people do respond to them, and people are seeing them.

Charles: No, no, no. I don't mean people ripping off their robes and masturbating in front of 14-year-olds. I mean women dressed in 1940s-era clothes walking around Pioneer Square with typewriters on their necks and writing poetry in a minute based on your life story. I mean a piece about a relationship that started and ended on a ferry performed on the ferry (that's not something I've seen, just an example of site-specific). Weird for the sake of weird may be entertaining sometimes, but it is no more relevant than the bland shit put on at regional theaters.

Maybe I am wrong about *Rachel Corrie* because, as you say, it drew a diverse audience so can affect more people's conversation. But when it comes right down to it, the majority of people in this country don't go see theater and don't really have the opportunity to see any unless the happen to get tickets to *The Lion King* on Broadway when they visit NYC. They certainly don't seek out fringe theater when they go anywhere else. I think when the vast majority of the country leaves an entire art form behind, that makes it largely irrelevant.

Jeremy: But that's my point. Most of what is put on at regional theaters *is* irrelevant and boring, and they have another option. The sort of theater you're describing does sound fascinating, but it's not too far from some of the things we have. When hundreds of zombies descend on a neighborhood, isn't that using some sort of collective art to shatter the quotidian? I'm not arguing against what you're talking about, but I think there's some presuppositions you're making.

I've never argued that fringe theater was good; it was tiresome and uncreative and utterly failed at its purported purpose to be the "writer's theater." The writers, such as they were, were usually theater school kids who were writing self-referential crap no one cared about. Picking up a listing from the Seattle Fringe Festival, virtually every third show was somehow an adaptation, parody, satire or commentary of *Hamlet*. Not good, not creative. But to suggest that means there aren't plenty of serious playwrights out there writing complex stories taking advantage of the theater's unique tools--whether that's on a proscenium stage, in a black box, or somewhere totally unexpected--that are relevant to our society is a proposition I don't understand.

Again, my goal isn't to defend the vast majority of the theater that's done. I'm just saying there is great theater out there that's meaningful and is cared about, debated, and relevant to more people than just the aged, well-off folks who can afford subscriptions to the larger theaters. I just feel that the cynicism some people have regarding theater threatens to throw out the baby with the bathwater.

Charles: I don't think I ever said that there aren't plenty of serious playwrights out there "writing complex stories taking advantage of the theater's unique tools," I just don't think what is made with those tools is generally viewed as a useful part of the conversation anymore. But, I think we do have some common ground. It's that the performance has got to be done well and be unique.

http://seattlest.com:80/2008/02/12/american_theatr.php

A cathedral for the god of motors

It's a meeting of architecture and automobile on the grandest scale, in which customers can pick up their new car and worship at the shrine of Germany's most powerful brand. Welcome to the phenomenon that is BMW World

Stephen Bayley
Sunday February 17, 2008
The Observer

The new BMW Welt, located near BMW's headquarters in Munich. Photograph: Marcus Buck/AFP/Getty

'Die Welt ist alles', according to Wittgenstein. In saying the world is everything, the philosopher affirmed the significance of life in the face of the nullity of death. 'Is a little bit crazy, no, like a hurricane?' is what they say of BMW Welt. Here in BMW's World is its own affirmation of life. They used to say BMW stood for 'Baader Meinhof Wagen', the favoured wheels of last year's model terrorists. Now BMW represents the apogee of consumer desire.
The swaggering, vitreous, filigreed, technophiliac grandiosity of this megastructure - near Munich's spectacular 1972 Olympic Stadium, not far from Dachau, 20 minutes from the airport - is astonishing. Especially in a week when General Motors reported a $37 billion loss and the Mayor of London continued his vengeful assault on the private car with a muddled, technologically illiterate and socially divisive tax. BMW Welt has just celebrated 100 days of activity. It presents, as an architectural phantasmagoria, an entire world organised and designed to BMW's meticulous engineering standards. Scary or magnificent, depending on your perspective. At five minutes to midnight for the automobile, what does it mean?

To call BMW Welt a showroom is to betray a conceptual poverty and further to betray the poverty of language that is its handmaiden. But, in all essentials, that is what it is. German car manufacturers have a tradition of allowing customers, usually from abroad, to take delivery of their precious new vehicle at the factory. In other countries, this might be a desultory experience, but not so in Bavaria. A certain formality and pomp attends the handover ceremony because this is Germany and they take things in general, and cars in particular, very seriously. This is what happens. A broker from New York, for example, will order his new BMW and jet to Germany to pick it up. But this is not a banal transaction. At BMW Welt he is confirmed in his good taste as a consumer by not only an architectural spectacle of the very highest quality, but also by technology exhibitions, shops, bars and restaurants. At the most exclusive of the latter he can lunch at altitude, a lead-crystal glass of high-specification Van Volxem Riesling to hand, while gazing through thrilling space at shiny new motors respectfully arranged for veneration as if religious

artefacts. With BMW thoroughness, not to say mania, there is BMW-baked bread on the table and four varieties of salt on offer (with scrupulous descriptive notes: I especially enjoyed the Australian Murray River Pink Salt Flakes, rich in algae).

After lunch, and a period of smug self-congratulation, our New York broker enjoys the rehearsed ritual of the hand-over, gets into his Monaco Blue BMW 530i and vrooms off on a 14-day tour of Europe, with an itinerary (Grossglockner, Lake Garda) helpfully provided by BMW as part of its commitment to providing him with a memorable experience, from soup to lock-nuts. On his return, the car is put in a container and reverentially shipped across the Atlantic where it will be unpacked by a Jersey longshoreman probably unfamiliar with the coruscating values and unhesitating perfectionism of BMW's World. Necessarily, a great deal of infrastructural sophistication is required to support the flawless dreamworld. So what we see above ground level is only about 40 per cent of the whole because, while there is heaven, there is an underworld too. To facilitate the handover ceremony, cars arrive the day before. As they have full tanks of petrol, regulations require that they are stored in an oxygen-reduced environment to obviate flammable risk. Underground, 285 brand new BMWs, like souls waiting to be released from Purgatory, are silently shuffled around on robotised pallets in an environment pressurised to the equivalent of 4,000m above sea level.

BMW Welt is the result of an architectural competition won in 2001 by the Austrian firm, Coop Himmelb(l)au. This name is revealing since it plays on notions of collaboration, blue-sky thinking and divine aspiration. It is one of those firms which emerged in the Eighties, put the Satan of frivolous postmodernism behind it, and reinvented modernism, making it more conceptually liberal, less tight-arsed and altogether more inventive in terms of spatial and formal invention. You could say much the same of Zaha Hadid, a runner-up in this competition. Significantly, at just the moment Coop Himmelb(l)au (which is an incongruous functional nightmare to type) was going techno-organic bonkers with this amazing building, so Chris Bangle, the American designer, was redrafting the signature look of BMW's cars, replacing visual decorum and rationality with complex curves and strange, agitated surfaces. Never forget, these are the people who gave us the word 'Zeitgeist'.

The building technology is appropriately grand. BMW Welt is supported by 775 concrete piles, each of them penetrating the earth's surface to a depth of 17 metres. The structure above ground is a geometrically boggling double cone, a design which would have been impossible to manage before computers with sophisticated three-dimensional modelling became available. There is 14,500 square metres of glass and the roof - a 'cloud hovering in space' according to Coop Himmelb(l)au's Wolf Prix - is covered with photovoltaic cells. As an architectural visitor, the experience is very nearly sublime. The enormous captive volume - exciting rather than daunting - is punctuated by aerial ramps. Prix, continuing his engagement with metaphors of height and air, said 'I want to fly', and this is what the visitor feels, transiting through this BMW-branded world, led by continuously shifting vistas. Subtle angles ease the process, and all the time, a sense of controlling intelligence coupled with superb detailing, worthy of a 7-series' cutlines, make a concept that was perhaps a little bit crazy entirely acceptable to the sober-suited board of the mighty BMW AG.

Impressive as it is architecturally, BMW Welt is even more interesting for its symbolic meaning and its significance as evidence of the status of the brand in modern thought. BMW has always been a company keenly aware of its image. It has also had associations with art that go back to its origins as a machine shop run by Karl Rapp in the days when Wassily Kandinsky was Munich's leading artistic figure, busy with the philosphical basis of abstract painting. Originally a manufacturer of aero-engines, in 1923 Rapp Motorenwerke's Max Friz produced the BMW R32 motorbike: a design of Bauhaus purity. In 1938, BMW created a department of Künstlerische Gestaltung (artistic development), the first of its type in Europe.

As a result of absolute consistency in technology, design and advertising (a commitment aided by being a family-owned business with no need to pander to short-termist investors) BMW built not just an industrial empire, but the most titanium-hard set of brand values on the planet. Its 'Neue Klasse' saloon of 1961 defined the achievements of the Wirtschaftswunder and became a symbol of the New Germany. Nine years later, BMW began work on its new HQ in Oberwiesenfeld in Milbertshofen, site of its first factory. This has become known as the Four Cylinder Building since its tectonic inspiration was a car

engine. Designer of the Four Cylinder Building was Karl Schwanzer, teacher of Coop Himmelb(l)au's Wolf Prix.

Nowadays, big companies are aware of architecture's role in building their brand. A building is like an advertisement, only it lasts longer. Equally, the big international architectural practices are, themselves, becoming brands. So there is something interestingly symbiotic in BMW Welt: a joint-venture by BMW and Coop Himmelb(l)au in the creation of valuable image capital. It is said that the corporate ego of BMW met its match in the architectural ego of Professor Prix. Additionally, this emphatically industrial monument is a ravishingly conceived, spectacularly hard-edged and crisply detailed reminder that, so far as corporate architecture is concerned, the information age has produced little of interest. Google's HQ looks like a double-glazing depot. Cars may be facing extinction, but they are more gorgeous than intangible gigabytes.

So there is something triumphant and perhaps a little elegiac about BMW Welt. Maybe even Weltschmerz, that untranslatable German word for 'the sadness of things'. With their national economic commitment to the car, the Germans are perhaps a little behind the rest of us in revisionist transport policies. BMW is not alone. The Welt is just the latest in a series of vanity projects throughout Germany. Volkswagen has built Autostadt in Wolfsburg and its Glass Factory in Dresden, where car assembly is turned into a sort of industrial opera. BMW had Zaha Hadid build a factory in Leipzig. Audi has turned the centre of Ingolstadt into a celebration of itself. Both Porsche and Mercedes-Benz are building ambitious new museums. Next stage in BMW's own programme of dramatic self-mythologising is reconstructing its own museum, just opposite the Welt. It will be fully five times bigger than its predecessor. Would we really like the rest of the world to be as well-designed as BMW Welt? There is something in the English love of amateurism that rejects its daunting perfectionism, something in English understatement uncomfortable with its bossy bravura. But then, again, you look at a superb magnesium casting on display and only a very dull person would not be moved to tears by its beauty. It was a Frenchman who said 'cars are our cathedrals', but it is BMW that has built the most exquisite shrine to the automobile.

The best of BMW: Four landmark designs

A revolution on two wheels
The BMW R32 of 1923 established the 'architecture' of BMW motorbikes for the next 70 years. Designed by Max Friz, in between aero engine projects, it was a beautifully conceived engineering diagram, a graphic of dynamic forces. A cross-section of the R32's famous twin cylinder 'boxer' engine resembles contemporary abstract pictures produced at the Bauhaus. **If it's good enough for 007...**
The BMW Z3 driven by James Bond in GoldenEye looked both forward and back. It was one of the first BMWs to be designed by Chris Bangle who, over the past few years, has overseen a complete transformation in design policy. He has moved away from austere Bauhaus principles, although his inspiration was the Nazi-era BMW 328. One version of the car was copied by Jaguar to create the famous XK120.

In the 'Knick' of time
The 'Neue Klasse' saloon appeared at the Paris Salon de l'Automobile in 1961. It was BMW's first wholly modern car, a confident expression of what had been achieved in the Wirtschaftswunder. There is a purity to the details, a hierarchy in the effects that is pure Bauhaus. Designer Wilhelm Hofmeister was the author of the signature features seen here: the prominent beltline, airy glass house and the 'Hofmeisterknick', the reverse bend on the rear pillar.

We are the Welt
The X6 is BMW's latest car. It retains established BMW styling cues, as well as familiar BMW competence, but recognises new market conditions. It occupies an indefinable category between 4x4, sports coupe and saloon. In terms of vehicle architecture, it exploits the technical limits of shape-making as surely as BMW Welt itself. If the old BMW was the rectinlinear Bauhaus, the new BMW is the morphologically complex Welt.

http://arts.guardian.co.uk:80/art/architecture/story/0,,2257387,00.html

Pakistan: Free to learn

Last Updated: 12:01am GMT 16/02/2008
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After a disastrous attempt to climb K2, former US Army medic Greg Mortenson had to be nursed back to health by the inhabitants of a remote and impoverished Pakistani village. He vowed to repay them by building a local school, and has now built more than 60 in similar areas across south Asia. Jonathan Foreman meets him

You might miss the girls' school at the end of the Shigar Valley if you did not spot the small dented blue metal sign by the side of the road. It announces, in English: 'In the Name of Allah, the Almighty: Jafarabad Community Girls School, Start May 2000. Visitors welcome.'

Shi'ite Muslim girls play in the grounds of Jafarabad Community Girls School. Behind are the high peaks surrounding the Shigar Valley

The school is a simple white L-shaped building with eight classrooms, all of which face the declining winter sun, and a small playground surrounded by a high cement wall. Sitting on the cold ground in neat shivering rows are a hundred little girls, who have come outside to welcome us. They are all wearing white headscarves (they are Shi'ite Muslims), their faces are chapped by the mountain dryness and cold. But they are the faces of progress in a place that has seen little for a long time.

Most of these girls will be the first literate women in their families. It is hard to appreciate how extraordinary that is until you spend some time in this isolated, extremely conservative corner of Pakistan's Northern Areas. This is Baltistan, also known as 'Little Tibet', a spectacularly rugged former kingdom nestled between the Karakorams and the Himalayas.

Here rural schools are rare, girls' schools even rarer, as the education of girls is condemned by religious extremists as un-Islamic. The Jafarabad school, along with 63 others in equally poor areas of Pakistan and Afghanistan, exists thanks to the efforts of a brave foreigner the locals call 'Dr Greg', who has been described as

'a real-life Indiana Jones' and spoken of as a candidate for the Nobel Peace Prize.

Bill Clinton has praised him and his two charitable organisations - Pennies for Peace and the Central Asia Institute (CAI) - and he has just co-authored a book, Three Cups of Tea, about his work, which has been on the New York Times bestseller list for months.

Dr Greg - or Greg Mortenson to give him his correct name; and he is a nurse, not a doctor - hates being called a hero. He fired his agent when she tried to sell his story to Hollywood. But how else do you describe a man - a white American - who has made it his life's mission to build girls' schools in this remote part of Asia, with no large organisation or government support behind him, and who has had to win over fundamentalist mullahs, opium-dealing warlords and corrupt bureaucrats?Female education is a controversial and dangerous business in this part of the world. Just last year, pro-Taliban tribesmen in the North-west Frontier Province threatened to kill girls who went to the local colleges and to execute their teachers. Many girls' schools have been bombed. Last year, one of Mortenson's own schools in Afghanistan was attacked by the Taliban.

Mortenson likes to say that if he dies doing his work, it is most likely to be in a car accident on one of the region's treacherous roads. But in 1996 he was kidnapped and held for a week by tribesmen in Waziristan, in north-west Pakistan. In 2003 he narrowly escaped being shot in a firefight between two opium gangs in eastern Afghanistan. He has had two fatwas handed down against him by hostile mullahs, one Shia and one Sunni. In both cases, local communities in Pakistan fought successfully to have them overturned in Sharia courts.

Greg Mortenson at Gultori Girls Refugee School in Skardu, Baltistan

Mortenson has been amazingly successful in areas where others have come a cropper. Yet his organisation has no fancy offices or fleet of Land Cruisers like most aid agencies or non-governmental organisations (NGOs). Based for half of the year in Bozeman, Montana, he spends the rest of his time pounding the roughest roads of Pakistan and Afghanistan, operating out of austere rooms in freezing guesthouses. His handful of staff in Pakistan and Afghanistan are local men, whom he recruited in chance situations.

His Islamabad manager and chief fixer, Suleman, is a former taxi driver who picked Mortenson up at the airport when he was beginning his crusade. Sarfraz Khan, his right-hand man in the remote Wakhan and Charpursan valleys that straddle the Pakistan-Afghan border, is a former smuggler and Pakistan army commando, who rides and walks for days to villages far from any driveable road. He met Wakhil, his point man in Kabul, by chance in a guesthouse on his first visit there in 2002. His staff are evenly split between Sunni, Shia and Ismaili. 'We send Sunni into Shia areas and vice-versa to show we can work together,' he says.

His key allies include clerics, warlords, military officers, foreign mountaineers and several former members of the Taliban - one of whom is now a teacher at one of his schools in Kashmir - and an army of ordinary villagers desperate for their children to receive an education. 'What I'm good at is putting together a team, finding the right people,' he says. He has no pretentions to any other ability except willpower. 'I'm just an average guy. I had to work really hard in school. Learning never came easy to me, but I've got those Midwestern ethics that force you to persevere.'

Mortenson was, in his own words, just 'a dirtbag climber' when he started on the strange path that has made him a bestselling author and an inspiration to Nato officers and peace campaigners alike. It was the early 1990s and Mortenson lived for rock and ice. Based in San Francisco, he supported himself by working as a trauma nurse, but spent most of his time climbing or running marathons. In the summer he would lead treks in Nepal or climb peaks such as Annapurna IV.

In 1993 he was invited to join a minimal-budget expedition to K2 - the world's second highest mountain. Two climbers made it to the summit, but another developed severe altitude sickness and had to be rescued. Mortenson stayed with him and as a result spent far too long at ultra-high altitude. On the way out to the Baltoro Glacier, a disorientated Mortenson became separated from the group. Eventually, he stumbled into the tiny Balti village of Korphe.

The villagers took in the filthy bearded giant - Mortenson stands well over 6ft tall - and nursed him back to health. It was only as he recovered that he realised how impoverished his rescuers were: how the sugar they put into his tea was precious and expensive, that the smoky hovel he shared was actually the best house in the village.

Mortenson rebuilt the school at Gundi Piran, Pakistan, after an earthquake

When he was able to walk around, he asked to see the school. There was none. The children of the village would sit on a little plateau drawing with sticks on the ground, practising whatever a visiting teacher may have taught them. Something about their enthusiasm under such difficult conditions reminded Mortenson of his recently deceased sister, who had suffered from severe epilepsy. He promised to return and build a school.

Back in the US, Mortenson devoted himself to finding $12,000 to finance Korphe's school. To save money he lived in the back seat of his car. He rented a typewriter and banged out 380 letters to various celebrities asking for help. (He had only one reply, from the American NBC newsreader Tom Brokaw who sent him a cheque for $100.) Mortenson sold his climbing gear for $800, then his car for $500.

Eventually, his luck began to change. A pupil at a school in Wisconsin, where Mortenson's mother teaches, offered to help after being told that one cent would buy a pencil for a child in Pakistan. In six weeks, his class collected 62,345 pennies. (This Pennies for Pakistan campaign evolved into the organisation called Pennies for Peace, which has raised more than $100,000 for school supplies.)

Next, a friend wrote a brief article in the newsletter of the American Himalayan Foundation about the K2 attempt and Mortenson's desire to build a school. It was read by Dr Jean Hoerni, a Seattle microchip pioneer and ardent climber. He sent Mortenson a cheque for $12,000, along with a note simply saying, 'Don't screw up'.

When Mortenson finally made the long trip up the Karakoram Highway, out east to Skardu and then by Jeep road and goat path to Korphe, the villagers were stunned to see him. Haji Ali, the village headman

said, 'Chisele!' (Balti for 'What the hell?'). The Balti people are used to climbers and trekkers promising help and then disappearing for ever.

Before beginning construction of the school, Mortenson travelled to the education ministry in Islamabad to seek permission. 'It took four days to get to see the right guy. He looked in all these dusty files and said that in 1989 a school had been built there: "These villagers are pulling your leg." But there was no school.' As a local education official explained to Mortenson, while encouraging him to go ahead, 'The school that's supposed to be there is now someone's 4x4 in Islamabad.' In other words, Mortenson discovered, it was one of 3,200 'ghost schools' revealed in 2000 when President Musharraf ordered a massive audit of Pakistan's schools.

Mortenson's first project was the template for those that came later. The CAI - Mortenson founded the Institute with Dr Hoerni in 1996 - usually provides the skilled labour, as well as materials like stone and steel bars. 'The village has to come up with the land, wood, sand and subsidised manual labour. Each house gives a certain number of days. We try to get them to match what we're giving. It's not about money, it's about getting the village to invest in the school.' Money is given in front of the whole village or at an assembly of the elders, so everyone knows exactly how much has been received. Such transparency and intense local involvement make all the difference in a region where foreign aid efforts frequently fail.

In May 2005 riots broke out in Baharak, the gateway to Afghanistan's Wakhan province, after Newsweek magazine erroneously reported that a Koran had been flushed down a lavatory at Guantanamo Bay. Every building with any connection to foreigners was burned by furious mobs, including the offices of the UN. But Mortenson's CAI school was left untouched - protected by village elders who saw it as their own.

In an Afghan restaurant in Islamabad, Mortenson explains the evolution of CAI. 'There was no initial plan,' he says, but he has generally sought 'to go into areas that are under-served, either because of physical isolation, religious extremism or because they are areas of conflict.' He cuts a rumpled, bear-like figure in a dust-coloured salwar kameez and a black fleece. He looks pale and tired, but youthful for almost 50. He has a sheepish smile that occasionally widens into a mischievous grin. A modest man, he manifests no hard edges, no trace of cynicism or long-suffering moral superiority. When he talks it is obvious that the speeches he gives in America to raise money for CAI must be agony. Mortenson has set up 55 schools in Pakistan and nine in Afghanistan. 'In Afghanistan, eight out of nine schools are mixed because there was no school in the community. In that case we encourage boys to come but girls have to make up at least 20 per cent. In Pakistan, 35 out of 55 are girls' schools.' There is often serious opposition to the mixed schools. As Khan (the ex-smuggler) explains to me, this is partly because a new school threatens the wealth of mullahs who run madrassas (which charge fees for the instruction they provide).

Rehana Batoon teaches science at Gultori Girls Refugee School

The teachers that Mortenson and his staff hire are mostly local women, even if they are relatively under-qualified. 'We tried bringing in outside teachers from Skardu and Gilgit but it didn't work,' he says. 'There were problems with class and caste. They said, "These people are so backward, they live like animals. I can't work here. I need more money."?' For him, the key is sustainability. 'It's important to entrust these communites to initiate and manage their own schools. You may not get as high results, but you get sustainable results.'

To help the schools become financially self-sustaining, CAI has funded poplar tree plantations: 'They mature in three years and are good for building. The money all goes into the community pot.' About a third of the schools are running independently, he says.

To persuade mullahs and local people that it is a good thing to educate girls, Mortenson and his staff use a variety of arguments. 'Khan or Ali [the ex-Taliban] will approach the local mullah or headman and say,

"If I wanted to marry your daughter, what would be the bride price?". They reply something like five goats, which is about £100. But if she had a fifth-grade education [up to the age of 10], the price can be four times that. So even for people who don't trust girls' education, there's a financial value to what we're doing.'

Sympathetic mullahs sometimes travel with Khan, Mortenson's envoy in the far north. They will point out that the Prophet's wife was an educated woman and also that an educated mother will help educate her sons. In some communities, Mortenson and his team have only been able to persuade the locals to allow girls to attend until they turn 10. He sees it as an acceptable minimum, one that allows for basic literacy. (Female literacy in Pakistan is under 25 per cent, though the government claims it is closer to 40 per cent.)

Mortenson explains that 'the marriage age is about 13 in rural areas. But when they have education, the age increases.' He also likes to point out that though most of the 9/11 hijackers were educated men, 'most had mothers who were illiterate'. Mothers must give their blessing to a son who wants to undertake jihad, Mortenson explains, and such a blessing may be less forthcoming from a mother who can read.

Mortenson believes that one reason why the Taliban is so anxious to destroy girls' schools is that, 'They are afraid that when these girls grow up they are going to lose sway over a large swath of an impoverished, illiterate society. If you educate a boy, you educate an individual. If you educate a girl, you educate a community.' Setting the curriculum of the CAI schools has been a challenge. Broadly, they use Pakistan's official curriculum for 'Urdu Medium' schools. This includes instruction in Pakistani studies and 'Islamiat' or Islamic studies. But CAI adds vital extras, such as classes in sanitation, nutrition and hygiene, and also efforts to preserve traditional cultures. In Baltistan, this means bringing in traditional storytellers, so that the children don't lose their cultural identity as they gain literacy.

'Doing work here is so fraught with mistakes and errors that it is worth spending years developing working models rather than saying we'll educate every girl in Pakistan and put computers in every school,' he says. 'A lot is dependent on complex religious, social and economic relationships, using their system to come up with solutions. It's more important to listen than to talk.'

The key to Mortenson's unusual approach lies in his own childhood. He grew up in Moshi, Tanzania, where his parents had moved to work as teachers. His father founded the Kilimanjaro Christian Medical

Centre, frequently defying the colonial expat community by involving local people in his work. Mortenson was educated in local African schools - he speaks fluent Swahili - an international school run by his mother and then a British school. His family moved back to America in 1972. At a tough urban high school in St Paul, Minnesota, he was beaten up by black children for saying he was from Africa.

'It was my first real experience of racism,' he says. Life in America was generally miserable. 'My parents were completely broke and we were living with my grandparents.' Four days out of high school, Mortenson joined the army, partly because his father and grandfather had done the same, but mostly because, 'It meant I could get college paid for on the GI Bill.' This was in 1975, the US Army's post-Vietnam nadir, when it was awash with drugs and racial tension, though Mortenson's training as a combat medic was later to come in useful. After his two years' service he won a football scholarship to the University of South Dakota.

He had just been accepted into medical school when his father died of cancer. He switched to a neurophysiology graduate programme in the naive hope of finding a cure for his epileptic sister Christa. And he began to climb mountains, an interest sparked by an ascent of Kilimanjaro when he was 11. In 1992, he was climbing on California's Mount Sill when he fell 800ft, smashing his humerus. At almost the same moment, his sister died. Her loss left him shattered and directionless. When, a year later, a climbing buddy approached him about being expedition medic for an assault on K2, he said yes, hoping the challenge would get his head straight. As things turned out, the experience gave his life direction.

From childhood, Mortenson's hero had been Sir Edmund Hillary, whom he admired as much for his humanitarian work as for climbing Everest. It was at a talk given by Hillary in San Francisco, just after Mortenson had built his first school in Pakistan, that he met Tara Bishop, whom he married five days later. They moved to Montana and had their first child, Amira, the following year. The couple now also have a son, Khyber. These days, Mortenson only goes away for two months at a time instead of six.

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ortenson seems to operate almost entirely on the basis of last-minute decisions - 'winging it,' he says - which can make him infuriating to deal with. He is pathologically late and arrives in Islamabad a full week after we had arranged to meet. Even his book's co-writer David Relin says that Mortenson operates

on 'Mortenson time' and speculates that habitual lateness has to do with his childhood in Africa. He also points out that it is another thing that binds him to the Baltistanis, who have no tenses in their language and are notoriously vague in their own timekeeping. Yet it is Mortenson's intuition that has made CAI so successful. 'You need a strategy but especially in this type of society you need intuition because that's what so much of their decision making is based on.'

One thing Mortenson knows for sure is that he doesn't want to expand the organisation so that it becomes more like a conventional NGO. 'I don't want a big office and a tea-man and a chowkidar [watchman],' he says. He doesn't even want to have a local office worthy of the name. CAI operates out of room 6 in the Indus Motel in Skardu during the summer months. Otherwise, his office is wherever he and his staff are at the time. In south Asia working for an NGO is a popular option for the children of the elite: it carries status and perks, such as smart modern offices. But Mortenson's local staff don't come from that class. Few of them are educated past their early teens. Their devotion to the cause of literacy - and to Mortenson - is deeply felt.

Khan, who travels around on horseback with a sat-phone and a laptop, recalls meeting Mortenson in 2000 when he was trying to help starving Kirghiz nomads in the Chapursan valley. 'I see a very helpful man,' he recalls. 'He's not saying, "I am big, I am American." He goes to every poor home and sits with the people. In Pakistan, rich people have a different style. They don't listen to poor people. Dr Greg is different, so the people like him.' I see something of this in Islamabad and Rawalpindi. Men shake hands here and embrace, but Mortenson even shakes the hand of the person opening the door or the 'boy' who sweeps the hotel.

The title of his book, Three Cups of Tea, refers to an old Balti saying: 'The first time you share tea, you are a stranger. The second time, you are an honoured guest. The third time, you become family.' The book has been a huge hit in the US, selling more than 850,000 copies. Mortenson forced the publisher to change the strapline from 'One man's mission to fight terror, one school at a time' to 'One man's mission to promote peace'. 'I think that people yearn for peace, they're tired of fighting terrorism,' he tells me. 'That's based on fear, while peace is based on hope.'

He is uncomfortable with the public recognition the book has brought him, but acknowledges that its success has done enormous good for CAI and the schools. 'It's put me in front of diverse groups, from people at the Pentagon to feminists in San Francisco to anti-war groups.'

For a man whose life was once defined by climbing, it is surprising to learn that Mortenson hasn't climbed at all since K2. 'I'd find it hard to justify, having children and climbing really high. A lot of my friends have died climbing,' he says, oblivious to the irony that his life is often in danger anyway. 'Sometimes, I miss it, but what I'm doing now is far more rewarding.'

To find out more about the Central Asia Institute, visit ikat.org. 'Three Cups of Tea' (Penguin) is available for £8.99 plus 99p p&p from Telegraph books (0870-428 4112; books.telegraph.co.uk)

http://www.telegraph.co.uk:80/arts/main.jhtml?xml=/arts/2008/02/16/sm_pakistan116.xml

Taking Play Seriously

By ROBIN MARANTZ HENIG

On a drizzly Tuesday night in late January, 200 people came out to hear a psychiatrist talk rhapsodically about play — not just the intense, joyous play of children, but play for all people, at all ages, at all times. (All species too; the lecture featured touching photos of a polar bear and a husky engaging playfully at a snowy outpost in northern Canada.) Stuart Brown, president of the National Institute for Play, was speaking at the New York Public Library's main branch on 42nd Street. He created the institute in 1996, after more than 20 years of psychiatric practice and research persuaded him of the dangerous long-term consequences of play deprivation. In a sold-out talk at the library, he and Krista Tippett, host of the public-radio program ''Speaking of Faith,'' discussed the biological and spiritual underpinnings of play. Brown called play part of the ''developmental sequencing of becoming a human primate. If you look at what produces learning and memory and well-being, play is as fundamental as any other aspect of life, including sleep and dreams.''

The message seemed to resonate with audience members, who asked anxious questions about what seemed to be the loss of play in their children's lives. Their concern came, no doubt, from the recent deluge of eulogies to play . Educators fret that school officials are hacking away at recess to make room for an increasingly crammed curriculum. Psychologists complain that overscheduled kids have no time left for the real business of childhood: idle, creative, unstructured free play. Public health officials link insufficient playtime to a rise in childhood obesity. Parents bemoan the fact that kids don't play the way they themselves did — or think they did. And everyone seems to worry that without the chance to play stickball or hopscotch out on the street, to play with dolls on the kitchen floor or climb trees in the woods, today's children are missing out on something essential.

The success of ''The Dangerous Book for Boys'' — which has been on the best-seller list for the last nine months — and its step-by-step instructions for activities like folding paper airplanes is testament to the generalized longing for play's good old days. So were the questions after Stuart Brown's library talk; one woman asked how her children will learn trust, empathy and social skills when their most frequent playing is done online. Brown told her that while video games do have some play value, a true sense of ''interpersonal nuance'' can be achieved only by a child who is engaging all five senses by playing in the three-dimensional world.

This is part of a larger conversation Americans are having about play. Parents bobble between a nostalgia-infused yearning for their children to play and fear that time spent playing is time lost to more

practical pursuits. Alarming headlines about U.S. students falling behind other countries in science and math, combined with the ever-more-intense competition to get kids into college, make parents rush to sign up their children for piano lessons and test-prep courses instead of just leaving them to improvise on their own; playtime versus résumé building.

Discussions about play force us to reckon with our underlying ideas about childhood, sex differences, creativity and success. Do boys play differently than girls? Are children being damaged by staring at computer screens and video games? Are they missing something when fantasy play is populated with characters from Hollywood's imagination and not their own? Most of these issues are too vast to be addressed by a single field of study (let alone a magazine article). But the growing science of play does have much to add to the conversation. Armed with research grounded in evolutionary biology and experimental neuroscience, some scientists have shown themselves eager — at times perhaps a little too eager — to promote a scientific argument for play. They have spent the past few decades learning how and why play evolved in animals, generating insights that can inform our understanding of its evolution in humans too. They are studying, from an evolutionary perspective, to what extent play is a luxury that can be dispensed with when there are too many other competing claims on the growing brain, and to what extent it is central to how that brain grows in the first place.

Scientists who study play, in animals and humans alike, are developing a consensus view that play is something more than a way for restless kids to work off steam; more than a way for chubby kids to burn off calories; more than a frivolous luxury. Play, in their view, is a central part of neurological growth and development — one important way that children build complex, skilled, responsive, socially adept and cognitively flexible brains.

Their work still leaves some questions unanswered, including questions about play's darker, more ambiguous side: is there really an evolutionary or developmental need for dangerous games, say, or for the meanness and hurt feelings that seem to attend so much child's play? Answering these and other questions could help us understand what might be lost if children play less.

''**See how that little** boy reaches for a pail?'' Stuart Brown asked one morning last fall, standing with me on the fringes of a small playground just north of the Central Park Zoo. ''See how he curves his whole body around it?'' Brown had flown to New York from his home in California to pitch a book about play to publishers. (He sold the idea to an editor at Penguin.) He agreed to meet me at the zoo while he was in town, to help me observe playfulness in the young members of many animal species, including our own.

Social play has its own vocabulary. Dogs have a particular body posture called the ''play bow'' — forelegs extended, rump in the air — that they use as both invitation and punctuation. A dog will perform a play bow at the beginning of a bout, and he will crouch back into it if he accidentally nips too hard and wants to assure the other dog: ''Don't worry! Still playing!''

Other species have play signals, too. Chimps put on a ''play face,'' an open-mouthed expression that is almost like a face of aggression except that the muscles are relaxed into something like a smile. Baboons bend over and peer between their legs as an invitation to play, beavers roll around, goats gambol in a characteristic ''play gait.'' In fact, most species have from 10 to 100 distinct play signals that they use to solicit play or to reassure one another during play-fighting that it's still all just in fun. In humans, the analogue to the chimp's play face is a child's smile, an open expression that indicates there is no real anger involved even in gestures that can look like a fight.

The day Brown met me in the park was a cold one, and the kids were bundled up like Michelin Men, adding more than the usual heft and waddle to their frolicking. Even beneath the padding, though, Brown could detect some typical gestures that these 2- and 3-year-olds were using instinctively to let one another know they were playing. ''Play movement is curvilinear,'' he said. ''If that boy was reaching for something in a nonplay situation, his body would be all straight lines. But using the body language of play, he curves and embraces.''

In their play — climbing up a slide, running around, passing buckets back and forth — the kids we watched were engaging in a pattern of behavior that many scientists believe is hard-wired. Their mothers and nannies were watching, too, no doubt having dragged the kids out of comfortable Upper East Side apartments because they thought daily play was important somehow, perhaps the first step in the long march toward Yale. To me all that little-kid motion looked just a bit silly — because play is, in many ways, a silly thing. Indeed, an essential component of play is its frivolity; biologists generally use phrases like ‘‘apparently purposeless activity’’ in their definitions of play. The definition proposed by Gordon Burghardt, an evolutionary psychologist at the University of Tennessee, refines that phrase a little. In his 2005 book, ‘‘The Genesis of Animal Play,’’ he wrote that play is an activity of ‘‘limited immediate function.’’

Burghardt included several other factors in his definition too. Play is an activity that is different from the nonplay version of that activity (in terms of form, sequence or the stage of life in which it occurs), is something the animal engages in voluntarily and repeatedly and occurs in a setting in which the animal is ‘‘adequately fed, healthy and free from stress.’’ That last part of the definition — that play requires that an animal be stress-free and secure — suggests that play is the biological equivalent of a luxury item, the first thing to go when an animal or child is hungry or sick.

This makes evolutionary scientists prick up their ears. How can a behavior be crucial and expendable at the same time? And play is indeed expendable. Studies of vervet monkeys found that playtime decreased to almost zero during periods of drought in East Africa. Squirrel monkeys won’t play when their favorite food sources are unavailable. In humans under stress, what happens with play is more complicated. Even under devastating circumstances, the drive to play is unquenchable. As George Eisen wrote in ‘‘Children and Play in the Holocaust’’: ‘‘Children’s yearning for play naturally burst forth even amidst the horror. . . . An instinctual, an almost atavistic impulse embedded in the human consciousness.’’

Yet play does diminish when children suffer long-term, chronic deprivation, either one at a time in abusive or neglectful homes, or on a massive scale in times of famine, war or forced relocation. And children can still survive, albeit imperfectly, without it.

For humans and animals alike, truly vigorous, wholehearted, spontaneous play is something of a biological frill. This suggests one possible evolutionary function: that in its playfulness, an animal displays its own abundant health and suitability for breeding. But a skeptic might see it differently: if a behavior is this easy to dispense with when times are hard, it might suggest that the behavior is less essential than some advocates claim.

If play is an extravagance, why has it persisted? It must have some adaptive function, or at least a benefit that outweighs its cost, or it would have been winnowed out by the forces of natural selection. One answer can be found through ethology, the study of animal behavior, which takes as one of its goals the explication of how and why a behavior evolved. Nonhuman animals can be more easily studied than humans can: the conditions under which they are raised can be manipulated, their brains altered and probed. And if there is an evolutionary explanation for a human behavior, it could reveal itself in the study of the analogous behavior in animals. Because of nature’s basic parsimony, many aspects of the brain and behavior have been conserved through evolution, meaning that many of the observations that ethologists make in rats, mice and monkeys could apply to humans too.

When it comes to animal play, scientists basically agree that it's mostly mammals that do it, and they basically agree that it's a mystery why they do it, since there are so many good reasons not to. It all seems incredibly wasteful, and nature does not usually tolerate waste.

Play can be costly in terms of energy expenditure. Juveniles spend an estimated 2 to 15 percent of their daily calorie budget on play, using up calories the young animal could more profitably use for growing. Frisky playing can also be dangerous, making animals conspicuous and inattentive, more vulnerable to predators and more likely to hurt themselves as they romp and cavort. Biologists have observed many play-related calamities, like bighorn lambs being injured on cactus plants as they frolicked. One of the starkest measures of the risk of play was made by Robert Harcourt, a zoologist now at Macquarie University in Sydney, Australia, who spent nine months in 1988 observing seal pups off the coast of Peru. Harcourt witnessed 102 seal pups attacked by southern sea lions; 26 of them were killed. ''Of these observed kills,'' Harcourt reported in the British journal Animal Behaviour, ''22 of the pups were playing in the shallow tidal pools immediately before the attack and appeared to be oblivious to the other animals fleeing nearby.'' In other words, nearly 85 percent of the pups that were killed had been playing.

So play can be risky. And, under stress, it tends to disappear. What then would justify, in evolutionary terms, the prevalence of play?

One popular view is the play-as-preparation hypothesis. In this perspective, play evolved because it is good preparation for adulthood. It is a chance for young animals to learn and rehearse the skills they will need for the rest of their lives, and to do so in a secure environment, where mistakes will have few consequences. Proponents of this hypothesis say play is a way — and, not incidentally, a pleasurable way — of getting into muscle memory the generalized movements of survival: chasing, running, probing, tussling. Through play, these movements can be learned when the stakes are low and then retrieved in adulthood, when the setting is less safe and the need more urgent.

The play-as-preparation hypothesis seems logical, and each new observation seems to confirm it. Watch wolf pups at play, and it is easy to see how the biting and wrangling could be baby versions of the actions the pups will need later to assert their dominance or to help the pack kill its prey. Watch 2-year-olds playing at a toy workbench with little wooden mallets and blocks, and you can picture them as adults employing those same muscles to wield a full-size hammer.

But one trouble with the hypothesis is that the gestures of play, while similar, are not literally the same as the gestures of real life. In fact, the way an animal plays is often the exact opposite of the way it lives. In play-fighting, if one player starts to edge toward victory, he will suddenly reverse roles and move from the dominant to the submissive posture. Or he will stop fighting as hard, something the ethologists call self-handicapping. This is rarely done in real fighting, when the whole point is winning. The targets of play are different, too. In rats, real fighters try to bite one another on the back and the lower flanks; in play fights, they go for the nape of the neck. The gestures players use to nuzzle the neck are not the same ones they need to rehearse if they are to win a serious fight.

Nor is there much experimental evidence to support a connection between youthful playing and adult expertise. One Scottish study of kittens, for instance, tested the hypothesis that ample object play early in life would lead to better hunting later on. The investigator, a psychologist named T. M. Caro then at the University of St. Andrews, found no difference in hunting skills between one group of 11 cats that had been exposed to toys in their youth and a control group of 8 cats that had not.

Now an alternative view is taking hold, based on a belief that there must be something else going on — play not as a literal rehearsal, but as something less direct and ultimately more important. It focuses on the way that play might contribute to the growth and development of the brain.

John Byers started thinking about the brain and play almost by accident. A zoologist at the University of Idaho, Byers had spent years studying the playful antics of deer, pronghorn antelopes and the wild mountain goats called ibex. He knew that play was risky — he had observed ibex kids falling off steep cliffs as they romped — and at first he thought maybe the animals were taking such risks because the

motor training helped them get in physical shape for adulthood. But something about this idea troubled him. Play can be exercise, he reasoned, but it was of too short duration to lead to long-term fitness or build muscle tone.

Byers preferred an alternate theory. In almost every species studied, a graph of playfulness looked like an inverted U, increasing during the juvenile period and then falling off around puberty, after which time most animals don't play much anymore. One winter afternoon in 1993, Byers was roaming the stacks at the University of Idaho library, flipping through books the way you do when you're not quite sure what you're looking for. One book contained a graph of the growth curve of one important region of the brain, the cerebellum, over the juvenile period in the mouse. The growth curve of the mouse cerebellum was nearly identical to the curve of mouse playfulness.

''It was like a light went on in my head,'' Byers told me from Washington, D.C., where he is temporarily working at the National Science Foundation. ''I wasn't thinking specifically about play, but I sort of had a long-term interest in behavioral development.'' And there it was: a chart that made it look as if rates of play in mice synchronized almost perfectly with growth rates in one critical region of the brain, the area that coordinates movements originating in other parts of the brain.

Intrigued, Byers enlisted the help of a graduate student, Curt Walker, who looked through the scientific literature on cerebellum development in rats and cats. ''Then we compared those rates to what was known about the rates of play in those species,'' Byers said. ''And rats and cats showed the same relationship as mice: a match between when they were playing and when the cerebellum was growing.''

The synchrony suggested a few things to Byers: that play might be related to growth of the cerebellum, since they both peak at about the same time; that there is a sensitive period in brain growth, during which time it's important for an animal to get the brain-growth stimulation of play; and that the cerebellum needs the whole-body movements of play to achieve its ultimate configuration.

This opened up new lines of research, as neuroscientists tried to pinpoint just where in the brain play had its most prominent effects — which gets to the heart of the question of what might be lost when children do not get enough play. Most of this work has been done in rats. Sergio Pellis, a neuroscientist at the University of Lethbridge in Alberta, Canada, is one of these investigators. He studies how brain damage in rats affects play behavior, and whether the relationship works in reverse: that is, not only whether brain-damaged rats play abnormally but also whether play-deprived rats develop abnormalities in their brains. Pellis's research indicates that the relationship might indeed work in both directions.

In a set of experiments conducted last year, Pellis and his colleagues raised 12 female rats from the time they were weaned until puberty under one of two conditions. In the control group, each rat was caged with three other female juveniles. In the experimental group, each rat was caged with three female adults. Pellis knew from previous studies that the rats caged with adults would not play, since adult rats rarely play with juveniles, even their own offspring. They would get all the other normal social experiences the control rats had — grooming, nuzzling, touching, sniffing — but they would not get play. His hypothesis was that the brains in the experimental rats would reflect their play-deprived youth, especially in the region known as the prefrontal cortex.

At puberty the rats were euthanized so the scientists could look at their brains. What Pellis and his collaborators found was the first direct evidence of a neurological effect of play deprivation. In the experimental group — the rats raised in a play-deprived environment — they found a more immature pattern of neuronal connections in the medial prefrontal cortex. (This is distant from the cerebellum; it is part of the cerebrum, which constitutes the bulk of the mammalian brain.) Rats, like other mammals, are born with an overabundance of cortical brain cells; as the animal matures, feedback from the environment leads to the pruning and selective elimination of these excess cells, branchings and connections. Play is thought to be one of the environmental influences that help in the pruning — and, this research showed, play deprivation interferes with it.

Figuring out what these findings mean in terms of function involves a certain amount of conjecture. Pellis interprets his observation of a more tangled, immature medial prefrontal cortex in play-deprived rats to mean that the rat will be less able to make subtle adjustments to the social world. But maybe the necessary pruning can happen later in life, through other feedback mechanisms having little to do with play. Maybe there were already compensatory changes happening elsewhere in the brains of these young rats where no one had thought to look. Current research in Pellis's lab, in which the brain is damaged first and the rat's playing ability is measured afterward, seems to confirm that the medial prefrontal cortex has an important role in play. But the exact nature of its action is still not clear.

Many of the other important studies on play and the brain have come from the lab of Jaak Panksepp, a behavioral neuroscientist who trained most of the neurological investigators in the field during the three decades he was at Bowling Green State University in Ohio (though Pellis, who studied at Australia's Monash University, was not among them). In the 1980s, Panksepp and a graduate student, Stephen Siviy, located the play drive in the thalamus, a primitive region of the brain that receives sensory information and relays it to the cortex. More recently, Panksepp has been exploring the connections among the play drive and certain human conditions, in particular attention deficit hyperactivity disorder (A.D.H.D.).

Panksepp has been studying A.D.H.D. in rats since the 1990s. In one experiment, to create a rat model of A.D.H.D., he and his colleagues took 32 newborn rats and destroyed in each the right frontal cortex, the region of the brain responsible for paying attention, planning ahead and being sensitive to social cues. (Human studies have shown that in children with A.D.H.D., frontal-lobe development is often delayed.) As a control, they performed sham surgery on 32 other rats, making the incisions but leaving the brain intact to be sure that any observed change would be due to the cortical destruction rather than the surgery itself. When the scientists compared the play behavior of the two groups, they found that the rats with the damaged right frontal cortex had higher levels of overall activity, as well as increased rates of rough-and-tumble play, as compared with the controls. The rats with damaged frontal cortices behaved much like children described as hyperactive.

Panksepp and his colleagues then exposed these superplayers to extra opportunities for play. One extra hour a day of play, which generally took the form of play-fighting during a critical early stage, sufficed to reduce hyperactivity. The scientists thought similar play therapy might work for children with A.D.H.D., particularly if it was undertaken in early childhood — between ages 3 and 7 — when the urges are ''especially insistent.''

Panksepp's current view of human A.D.H.D., he told me from his office at Washington State University, where he moved two years ago, is that it is in part ''overactivity of play urges in the nervous system.'' His ideas have made some impression on the human A.D.H.D. community, but not much. Benedetto Vitiello, the head of child and adolescent treatment and research at the National Institute of Mental Health, remembers hearing Panksepp give a talk at the institute around the time his article appeared in 2003. But he said he has not heard of any clinical studies since then that investigate whether extra play in early childhood helps ease the symptoms of A.D.H.D. Besides, Vitiello adds, there are many differences between a rat with a brain injury and a child with an intact but slowly developing brain. So even though he considers Panksepp's research ''interesting,'' he says that it has not quite led to a complete animal model of A.D.H.D.

Animal-play experiments have focused largely on the most vivid form of play — social play, in particular the kind of social play known as play-fighting. But it's clear to anyone who thinks about it that

play-fighting is a very narrow definition of play. Wrestling is not the same as chasing. For that matter, playing tag is not the same as playing dress up; playing in a soccer league is not the same as shooting hoops in a neighborhood park; and none of these are the same as playing Scrabble or Uno or video games. For all its variety, however, there is something common to play in all its protean forms: variety itself. The essence of play is that the sequence of actions is fluid and scattered. In the words of Marc Bekoff, an evolutionary biologist at the University of Colorado, play is at its core ‘‘a behavioral kaleidoscope.’’

In fact, it’s this kaleidoscopic quality that led Bekoff and others to think of play as the best way for a young animal to gain a more diverse and responsive behavioral repertory. Thus, the currently fashionable flexibility hypothesis, a revival of an idea Bekoff first proposed in the 1970s. If a single function can be ascribed to every form of play, in every playful species, according to this way of thinking, it is that play contributes to the growth of more supple, more flexible brains.

‘‘I think of play as training for the unexpected,’’ Bekoff says. ‘‘Behavioral flexibility and variability is adaptive; in animals it’s really important to be able to change your behavior in a changing environment.’’ Play, he says, leads to mental suppleness and a broader behavioral vocabulary, which in turn helps the animal achieve success in the ways that matter: group dominance, mate selection, avoiding capture and finding food.

The flexibility hypothesis is something of a bridge between the play-aspreparation hypothesis and more recent findings about play and neurological growth. It works best when explaining play-fighting. With its variable tempo, self-handicapping and role reversals, play-fighting is like the improvisation of a jazz quartet, forcing an animal to respond rapidly to change.

Players riff off one another. One thrusts, the other parries; suddenly the one that was on top is pinned on the bottom and then just as suddenly is on top again. As in jazz, the smoothness of the improvisation matters as much as the gestures themselves. ‘‘Ability to use and switch among alternative sequences,’’ Maxeen Biben, an ethologist formerly at the National Institutes of Health, wrote in an essay in ‘‘Animal Play,’’ ‘‘may be as valuable as getting a lot of practice at the most effective sequences.’’

The physical movements of playfighting provide the environmental input needed to prune the developing cortex, as Sergio Pellis’s research suggested. This pruning is one way an animal achieves the ability to predict and respond to another animal’s shifting movements. Some play scholars say that such skills will come in handy in adulthood, not only in fighting but in other real-life situations as well, like evading capture and finding food. A more skeptical view would be that play-fighting might not really teach much at all about an animal’s subsequent skills — there was that Scottish study about object play in kittens, remember, that showed no connection to hunting ability in adulthood — but it does one thing for sure: it makes the animal that play-fights a better play-fighter. And there might be something to be said for that. The more a young animal plays, the richer the animal’s life, the more fun, the more stimulated, the more social. There might possibly be an immediate benefit just from that simple fact.

Which reveals an important rift in the study of the purpose of play: a debate among play scholars about how to tell the story of play’s possible short-term and long-term benefits. The flexibility hypothesis imposes one such story, but it might not be the best story. Just because it’s possible to see how playing might contribute to a suppler brain and a more varied behavioral repertory, it does not follow that playing

is the only way to achieve such flexibility. This relates to the concept of equifinality, an idea from systems theory that says there are usually more ways than one to arrive at a particular end. The fact that play offers one way of getting to an end need not mean it is the only way — nor need it mean that getting to that end is the ultimate purpose of play.

The problem of equifinality troubled Anthony Pellegrini, a psychologist at the University of Minnesota, when he tried to interpret his findings about rough-and-tumble play in fifth-grade boys. He and his colleagues studied the recess behavior of 37 boys and scored a play episode as rough-and-tumble when a boy engaged in one from a list of behaviors — ‘‘tease, hit and kick at, chase, poke, pounce, sneak up, carry child, pile on, play-fight, hold and push’’ — while displaying a wide smile or ‘‘play face.’’ Knowing that earlier studies found a connection between roughand- tumble play and a child’s peer affiliation and social problem-solving flexibility, the scientists hypothesized that the most vigorous players would also be the most socially competent. But Pellegrini found no clear benefits in the boys who played the most. Maybe, he wrote in an essay about this research in ‘‘The Future of Play Theory,’’ it’s because other things that happen at recess — ‘‘cooperative social games, comfort contact and conversation’’ — might be just as good as pouncing or chasing at achieving a sense of connection.

‘‘Developmental systems tend to be highly redundant,’’ wrote Patrick Bateson, a noted biologist at Cambridge University, in a book of essays called ‘‘The Nature of Play.’’ This means, Bateson wrote, ‘‘that if an endpoint is not achieved by one route, it is achieved by another. Playing when young is not the only way to acquire knowledge and skills; the animal can delay acquisition until it is an adult.’’

Nonetheless, even Bateson, a prominent play scholar who recognizes the quandary posed by equifinality, suggested that play is the best way to reach certain goals. Through play, an individual avoids what he called the lure of ‘‘false endpoints,’’ a problem-solving style more typical of harried adults than of playful youngsters. False endpoints are avoided through play, Bateson wrote, because players are having so much fun that they keep noodling away at a problem and might well arrive at something better than the first, good-enough solution.

But maybe the flexibility hypothesis is itself a false endpoint. Maybe the idea that play is the best route to a whole host of good results — creativity, social agility, overall mental suppleness — is just the first idea scientists landed on, and they were inclined to accept it because it fit so well with their innate ideas about the nature of childhood. This is the view of a small group of play scholars we’ll call the play skeptics. What worries the play skeptics is that most people in the industrialized West — scientists in the field, play advocates and all the rest of us, parents, teachers, doctors, scholars, all the children and all the aging children — have been ensnared by what skeptics call the ‘‘play ethos.’’ By this they mean the reflexive, unexamined belief that play is an unmitigated good with a crucial, though vaguely defined, evolutionary function.

‘‘Play ethos’’ comes from Peter Smith, a psychology professor at the University of London and a leading authority on play’s effect on children’s emotional development. He uses it as a cautionary term, a reminder that most conclusions about play’s adaptive function have so far been based not on scientific evidence but on wishful thinking.

For Smith to suggest that scientists have fallen under the spell of the play ethos is a kind of apostasy, because some of the earliest bits of evidence used to establish the play ethos in the first place came out of Smith’s own laboratory at the University of London in the late 1970s. But it was in the execution of those experiments, and the follow- up studies that revealed their fatal flaw, that Smith came to understand, more than most, the importance of caution.

In one of his early experiments, Smith and his colleagues put 3- and 4-year-olds in two different play settings. In one group the children were allowed to play, in whatever way they felt like, with several wooden sticks. In the other group they were shown by an adult ‘‘play tutor’’ how to fit two sticks together to make a longer one. Then the children were given two tasks. First they had to retrieve a marble by connecting two sticks. Both groups performed this task, which Smith called ‘‘direct’’ problem solving, about equally well. Then they had to retrieve a marble that had been pushed farther away, so they could reach it only by connecting three sticks, not just two — what Smith called ‘‘innovative’’ problemsolving.

The children who had played with the sticks performed this task significantly better than the ones who had been shown how to join together only two sticks.

‘‘At this point I was happy,’’ Smith recalled years later, writing in ‘‘The Future of Play Theory.’’ His findings were taken as evidence that spontaneous free play led to more creative thinking. But then he started to wonder whether he himself had fallen victim to the play ethos.

A single investigator had conducted the entire experiment, serving as both play tutor and evaluator on the problem-solving task. Might the experimenter subconsciously have favored the free-play children, Smith asked himself, maybe by giving subtle nonverbal cues or scoring more leniently? He ran the experiment again, bringing in a second investigator who could test the children without knowing whether they were in the free-play or the tutored group.

This time Smith found no difference in innovative problem solving between the two groups. At first he didn’t believe his new results, thinking that maybe the sample size was too small or that the groups were somehow poorly matched. But further studies bore out this nonfinding, and Smith realized, on reflection, that he and his colleagues had probably been giving inadvertent hints to the free-play group the first time around. He ascribed it to his own subconscious idealization of play.

Idealization is a trap. And it seems most seductive when it comes to play, especially one particular kind: pretend play. This is the kind ethologists tend to ignore, since it is difficult to argue — though a few scientists have tried — that animals are capable of pretending. Yet for humans, pretend play is one of the most crucial forms of play, occupying at its peak at about age 4 some 20 percent of a child’s day. It includes some of the most wondrous moments of childhood: dramatic play, wordplay, ritual play, symbolic play, games, jokes and imaginary friends. And it is the kind of play that positively screams out for hyperbole when outsiders try to describe it. This is where even coolheaded scientists get florid in their prose — and where play advocates like Stuart Brown and play skeptics like Peter Smith engage in their most vivid disagreements about the ultimate purpose of play.

Brown talked about pretend play at the New York Public Library last month, saying that a playful imagination ‘‘can infuse the moment with a sense of magic.’’ But skeptics find such comments annoying. ‘‘Despite the heartwarming rhetoric we dish out in our teacher-training classes, children do *not* have unlimited imagination,’’ wrote David Lancy, an anthropologist at Utah State University. ‘‘Their make-believe and, by extension, other play forms, is constrained by the roles, scripts and props of the culture they live in.’’ Lancy pointed to field studies of a Mayan community in which children teach their younger siblings how to pretend in the most pedestrian of ways, ‘‘focusing their attention on washing, caring for babies and cooking’’ — no magic there.

The skeptical Smith does see some value to fantasy play: when children dress up, make and use props and devise story lines to playact, he says, they learn to use sophisticated language, negotiate roles and exchange information. But he adds that many of these benefits could be gained just as well through other

forms of play, work activities and plain old-fashioned instruction. Smith does not deny that playing is great fun — his own children were playing noisily in the background when I phoned him at his home in London, and he never once asked them to hush — but he wants everyone to keep it all in perspective.

Keeping play in perspective means looking at it not just clearly but fully. Not everything about childhood play is sweetness and light, no matter how much we romanticize it. Play can be dangerous or scary. It can be disturbing, destabilizing, aggressive. It can lead to misunderstandings and hurt feelings, leaving children out of the charmed circle of the schoolyard. The other side of playing is teasing, bullying, scapegoating, excluding, hurting.

I well remember this darker side of play from my own girlhood. Like many other klutzy kids, I hated recess, since it stripped me of the classroom competence that was such good cover for my shyness. Out in the schoolyard, there was no raising your hand with the right answer. I had to wait to be asked to play jump-rope and had to face embarrassment if I missed a skip or — worse, much worse — if nobody ended up asking me. Even pretend play could take an ugly turn if my playmates made their dolls say nasty things.

Recognizing play's dark side is not difficult, if we are really willing to search our memories. To play scholars, thinking about play's negatives can be clarifying and might even generate new ideas, not only about play but also about the double-edged nature of pleasure itself. Why is it that something so joyous, something children yearn for so forcefully, can be so troubling too? If you're accustomed to looking for evolutionary explanations for perplexing behavior, here is something meaty to chew on: what could be the adaptive advantage of using play to wrestle your demons?

Demons do indeed emerge at playtime, in part because children carve out play spaces that have no room for the civilizing influence of adults. This is what happened in the recess ''fort culture'' that arose spontaneously in 1990 at the Lexington Montessori School in Massachusetts, when the elementary-age children shunned the organized play their teachers had arranged and instead started building forts on their own in the surrounding woods. An intricate and rule-bound subculture developed, one that is still going on.

Mark Powell, then a graduate student at Lesley University in Cambridge nearby, observed the recess fort culture for several years in the 1990s and described it in 2007 in the journal Children, Youth and Environments. For the first few years, he wrote, petty conflicts, stick stealing and ejections for minor infractions were a constant background hum in a play culture that was otherwise high-spirited and fun. But it finally erupted into a miniwar one autumn, sparked by the hostile actions of a fort of 6- year-olds headed by a tyrannical little boy who called himself the General. Within a month of the General's appearance, Powell wrote, the fantasy war play ''had become a reality with daily raids and counterattacks, yelling, the occasional physical scrape and lots of hurt feelings.'' It took the intervention of some other children, teachers and the General's parents finally to persuade the child to call a truce.

Brian Sutton-Smith, one of the nation's most eminent play scholars, has seen eruptions like the General's many times before, but they don't worry him. In fact, he embraces them. In such an elaborate play culture, he wrote, where so many harsh human truths come to the fore, ''children learn all those necessary arts of trickery, deception, harassment, divination and foul play that their teachers won't teach them but are most important in successful human relationships in marriage, business and war.''

Sutton-Smith's 1997 classic, ''The Ambiguity of Play,'' reflects in its title his belief that play's ultimate purpose can be found in its paradoxes. During his years at Columbia's Teachers College and the University of Pennsylvania, Sutton- Smith, a psychologist and folklorist, took careful note of how play could be destabilizing, destructive or disturbing. He collected renditions of the stories children told in their imaginative or dramatic play, stories of ''being lost, being stolen, being bitten, dying, being stepped on, being angry, calling the police, running away or falling down.'' Are these really the thoughts percolating inside our children? And is expressing these thoughts through play somehow good for them? Sutton-Smith called this underbelly of imaginative play part of the ''phantasmagoria,'' where children's thoughts run wild and all the chaotic bits of the real world get tumbled together and pulled haphazardly apart in new, sometimes even scarier confabulations.

Why would such an enriching activity as play also be a source of so much anarchy and fear? Sutton-Smith found one possible answer by reading Stephen Jay Gould, the author and evolutionary biologist. The most highly adaptive organisms, Gould wrote, are those that embody both the positive and the negative, organisms that ‘‘possess an opposite set of attributes usually devalued in our culture: sloppiness, broad potential, quirkiness, unpredictability and, above all, massive redundancy.’’ Finely tuned specific adaptations can lead to blind alleys and extinction, he wrote; ‘‘the key is flexibility.’’

What Gould called quirkiness, Sutton-Smith called play. ‘‘Animal play has been described by many investigators as fragmentary, disorderly, unpredictable and exaggerated,’’ Sutton-Smith wrote, and ‘‘child play has been said to be improvised, vertiginous and nonsensical.’’ The adaptive advantage to a behavior that is multifaceted, then, is that pursuing it, enjoying it, needing it to get through the day, allows for a wider range in a play-loving person’s behavioral repertory, which is always handy, just in case.

Playing might serve a different evolutionary function too, he suggests: it helps us face our existential dread. The individual most likely to prevail is the one who believes in possibilities — an optimist, a creative thinker, a person who has a sense of power and control. Imaginative play, even when it involves mucking around in the phantasmagoria, creates such a person. ‘‘The adaptive advantage has often gone to those who ventured upon their possibility with cries of exultant commitment,’’ Sutton-Smith wrote. ‘‘What is adaptive about play, therefore, may be not only the skills that are a part of it but also the willful belief in acting out one’s own capacity for the future.’’

It’s a pretty idea, the notion that play gives you hope for a better tomorrow, but science demands something a little less squishy. Science demands that if there are important long-term benefits to play, they must be demonstrated. That is why studies of play-deprived rats are so fascinating; they offer objective evidence that in at least some animals, insufficient play can have serious consequences.

Even when science suggests certain answers, however, it cannot easily make the leap from young rats to young humans, nor tell us much of anything about how those young children should behave. What if all the things we hope children derive from free play — cognitive flexibility, social competence, creative problem-solving, mastery of their own bodies and their own environments — can be learned just as well by teaching these skills directly? What if the only clear advantage to the vanishing 20-minute recess is that it makes kids less restless in class, something that can be just as easily accomplished by a jog around the all-purpose room?

Which brings us back to wondering what would be lost if the Cassandras are right, whether children would suffer if free play really does turn out to be a thing of the past. It seems almost ludicrous to ask such a question. Of course play is good for something; it is the essence of good. Watch children at play, and the benefits are so obvious: just look at those ecstatic faces, just listen to those joyful squeals. Stuart Brown alluded to it in his library talk last month. ‘‘Look at life without play, and it’s not much of a life,’’ he told the audience. ‘‘If you think of all the things we do that are playrelated and erase those, it’s pretty hard to keep going.’’ Without play, he said, ‘‘there’s a sense of dullness, lassitude and pessimism, which doesn’t work well in the world we live in.’’

In the end, it comes down to a matter of trade-offs. There are only six hours in a school day, only another six or so till bedtime, and adults are forever trying to cram those hours with activities that are productive, educational and (almost as an afterthought) fun. Animal findings about how play influences brain growth suggest that playing, though it might look silly and purposeless, warrants a place in every child’s day. Not too overblown a place, not too sanctimonious a place, but a place that embraces all styles of play and that recognizes play as every bit as essential to healthful neurological development as test-taking drills, Spanish lessons or Suzuki violin.

http://www.nytimes.com/2008/02/17/magazine/17play.html?em&ex=1203397200&en=75584d45be0254d7&ei=5087%0A

Master Builders of Ballet's Future

By ALASTAIR MACAULAY

BY the end of the last century ballet was looking more like a museum art than it had in more than 400 years. With the deaths of George Balanchine, Antony Tudor, Frederick Ashton, Kenneth MacMillan and Jerome Robbins, the ranks of world-class choreographers specializing in ballet looked thin or just empty. The three biggest names creating new ballets were Twyla Tharp, William Forsythe and Mark Morris: each, by ballet standards, in some way controversial and offbeat. But the new millennium has brought to the fore two young men who are full-time exponents of ballet as an art both traditional and new: Christopher Wheeldon, the Anglo-American who has been resident choreographer at New York City Ballet since 2001 but is giving up the post this month, and Alexei Ratmansky, the Russian who announced just weeks ago that he was leaving the artistic directorship of the Bolshoi Ballet in Moscow to focus on choreography.

New York has been the best place to watch them. Mr. Wheeldon created "Polyphonia," the ballet that pushed him into the big time, for City Ballet in 2001. Mr. Ratmansky made his breakthrough with "The Bright Stream" at the Bolshoi in 2003 but produced his next major work, "Russian Seasons," for City Ballet's Diamond Project in 2006. All of which suggests that City Ballet, so inseparable from the artistic legacies of Balanchine and Robbins, is again becoming the world's liveliest fulcrum of new ballet choreography. Now Mr. Wheeldon, 34, is leaving City Ballet to run his own company, Morphoses. For a time it seemed that Mr. Ratmansky, 39, would succeed him. But now, it turns out, he is coming here just to make two ballets over the next three years. Why does it matter who takes these positions? What exactly does a resident choreographer do? How does the job differ from that of artistic director?

The matter is especially ambiguous at City Ballet, which, unlike most companies today, employs not an artistic director but a ballet master in chief, Peter Martins. And there is a built-in risk at City Ballet: What if the resident choreographer or ballet master guides the company into a new style at odds with its inheritance?

Artistic directors are often not choreographers at all; they deal with fund-raising, casting, daily classroom teaching, commissions, repertory and (not least) the board of directors. If a company wishes ballet to

remain, at least in part, an art of the new, it will try to employ a resident choreographer (assuming any is suitable, available and affordable). The person in that role will produce at least one new ballet a year, draw new qualities out of the company's dancers, shape new roles to which other dancers aspire and develop some style that becomes part of the company's identity.

At City Ballet, Balanchine filled all those roles and more. He took the title of ballet master in chief because the foundation of his work was his classroom teaching, in which he developed aspects of academic ballet to new intensity. His teaching began at the student level, as the basis of what was and is taught at the School of American Ballet.

Ballet master, or maître de ballet, had been the standard title of teacher-choreographers from the 17th to the 19th century, and it applied to the makers of the greatest surviving 19th-century ballets: August Bournonville in Denmark and Marius Petipa in Russia. The ballet master, now as then, takes the academic language of this impersonal and traditional art, with its turnout of the legs and its five positions of the feet, and develops in the classroom a style that is vitally connected to the idiom of the new ballets he choreographs for the company to dance onstage. He trains dancers to his specifications and then gives them new vehicles in which they may reveal themselves.

City Ballet had other resident choreographers in Balanchine's lifetime, notably Robbins, who was named a company ballet master though he was not a teacher. (To make matters more confusing, he had at one time been artistic director of his own company, Ballets U.S.A.) But it was Mr. Martins who eventually succeeded Balanchine as ballet master in chief. He led and leads the classroom teaching through the school and the company, and he has continued to choreograph.

The task of running a ballet company is far more onerous today than it used to be. There are now a number of such leaders whose initial talent for choreography (which helped to get them the jobs) has lost its inspiration. Mr. Martins is one; David Bintley at Birmingham Royal Ballet and Helgi Tomasson at San Francisco Ballet are two more; there are others. They deliver premieres, but not works of art the audience can inhabit. Perhaps Mr. Martins admitted as much when he appointed Mr. Wheeldon resident choreographer in 2001. Or perhaps not: this job, though new as a position at City Ballet, was effectively the same one Robbins had done for decades.

Neither Mr. Wheeldon nor Mr. Ratmansky is known as a teacher, but each looks more like a true ballet master than anybody else currently on the scene. That is, they build ballets that find accents and life within the traditional vocabulary of ballet. This is why both "Polyphonia" and "The Bright Stream" caused such stirs. Both men have since been in demand to create ballets for the world's foremost companies.

Mr. Ratmansky is also the most promising Russian-born choreographer since Balanchine. Perhaps others in the intervening years began with as much talent, but the aesthetic constraints of the Communist era either nipped several choreographic blooms in the bud or perverted them into agitprop apparatchiks.

Unlike any other Russian post-Balanchine dancemaker I know of, Mr. Ratmansky choreographs from a broad and unclouded command of the classical-ballet lexicon. And despite his work in the West, he seems, so far, very much a Russian artist.

He has choreographed to Shostakovich music that was composed during the Soviet era and then fell out of favor ("The Bright Stream"); to a Prokofiev score that succeeded in Stalinist Russia and has won international success ever since ("Cinderella," for the Kirov); to a score by the émigré Stravinsky ("Jeu de Cartes," choreographed for the Bolshoi as "Go for Broke"); and to music by two composers of the post-Communist era, Yuri Khanon ("Middle Duet," choreographed for the Kirov and danced by City Ballet since 2006) and Leonid Desyatnikov ("Russian Seasons," for City Ballet).It's quite possible that, as Mr. Ratmansky matures, he may develop a style that would clash with the Balanchine precepts still pursued at City Ballet: tight closed positions contrasted with stretched open ones; weight placed over the front of the foot; simple delivery; complex musicality. At the Bolshoi he has taken steps to revive ballets by the Moscow-born Léonide Massine, whose symphonic ballets in the late 1930s and '40s were seen by New York dancegoers as the antithesis of Balanchine.

Today, nonetheless, the Ratmansky and Balanchine styles look congenial. And I can't help speculating what connections would arise between Balanchine's émigré-Russian classicism and Mr. Ratmansky's new-Russian idiom if he eventually were to take the City Ballet post. In the years that Mr. Wheeldon has been the resident choreographer there have certainly been links between his oeuvre and Balanchine's. Although I don't see that his work has shown anyone how to dance Balanchine better, he has often spotted those who are dancing Balanchine with distinction and given them a new bloom in his own choreography.

Perhaps Mr. Ratmansky could do as much, or more. His 2008 and 2010 premieres for City Ballet will be keenly watched. Could he yet become resident choreographer?While Balanchine was alive, modernity took precedence over tradition in City Ballet's repertory; his choreography was the living epitome of New York Modern. Now Balanchine is tradition, and it has been hard for anybody to know how to be modern in his (still radical) wake. Yet Mr. Ratmansky has not, to date, looked inhibited by his great precursor, and his ballets have more sheer authority than Mr. Wheeldon's.Like Balanchine, Mr. Ratmansky draws on his complex sense of Russia like a great well. New York, where Russian émigrés are as influential a part of dance as they were in Balanchine's era, would be an exciting place to watch him at work. Roll out the next Ratmansky premiere at City Ballet: May 29.

http://www.nytimes.com/2008/02/17/arts/dance/17maca.html

Theatre Breaks Barriers for Disabled Actors

February 14, 2008
By Lauren Horwitch
Director Ike Schambelan had a problem. The founder of Theater by the Blind in Manhattan wanted to cast company regular Ann Marie Morelli as Tatiana and Hermia in his production of *A Midsummer Night's Dream* last year. However, Morelli's multiple sclerosis kept her in a wheelchair.

Even after 29 years of working with blind actors, Schambelan hesitated. He wondered how he would direct her. Would the audience accept her in the roles? How would she get on stage?

"You would think I would not be scared to use someone in a wheelchair. I was. It took me a long time to say, 'Yes, Ann, this is right. Let's do this,' " Schambelan said.

Casting Morelli turned out to be a brilliant move that The New York Times said added "a most delightful extra layer of meaning in the production." TBTB's second production in 2007, John Belluso's *The Rules of Charity*, featured another actor in a wheelchair, Christopher Hurt, and Gregg Mozgala, who has cerebral palsy.

The productions inspired Schambelan to change the Theater by the Blind to Theater Breaking Through Barriers. As announced Jan. 24, the company will continue its commitment to blind and vision-impaired artists but will also include actors with a range of disabilities. The new TBTB will open its 2008 season with *Romeo and Juliet*, March 5-April 6 at the Kirk Theatre on Theatre Row, featuring Mozgala, TBTB co-artistic director George Ashiotis, who is blind, and Nicholas Viselli and Emily Young.

"It was time to reflect the reality of what our lives are and what our country's lives are," said Schambelan. Indeed, people with disabilities are rarely seen on stage, on television, or in films despite being a sizable minority in the United States. According to the U.S. Census Bureau, about 18 percent of Americans -- over 51 million people -- have some level of disability. Yet, according to a 2005 SAG report titled "The Employment of Performers with Disabilities in the Entertainment Industry," less than 2 percent of TV characters display a disability, and only 0.5 percent have speaking roles.

Gaining Access

L.A.-based actor Teal Sherer, who became a paraplegic at age 14 as a result of a car accident, said being in a wheelchair adds another level to the already challenging business of being an actor. Not only are roles for actors in wheelchairs rare, but she literally can't get into many casting director offices and acting classes.

"I auditioned last year for a commercial. They wanted somebody in a wheelchair, but the casting office wasn't accessible, so we all had to audition downstairs in the parking lot," Sherer said. "It's like that with acting classes. I am so limited by where I can study because of the accessibility."

Such challenges haven't prevented Sherer from success. She is a regular on NBC's upcoming sitcom *I'm With Stupid*, appeared in the 2005 telepic *Warm Springs*, and recently booked a national commercial for Liberty Mutual. Sherer is also producing a staging of Michael Ervin's *The History of Bowling*, starring Danny Murphy and Lynn Manning, at the NoHo Arts Center in North Hollywood, Calif.

"We're hoping that it will be a kind of springboard into a theatre company for people with disabilities but for able-bodied people too," she said of the production, opening March 14. "It'd be a place where we know we could go and bring material and put up stuff. There's nothing really like that [in L.A.]."

L.A. is home to Deaf West Theatre, which features deaf and hearing-impaired artists. Center Theatre Group also hosted a play-development program for artists with disabilities. It was discontinued in 2005.

Reporting Recognition

Sherer and some of her fellow Screen Actors Guild members are working to change Hollywood's perceptions of people with disabilities through the guild's Performers With Disabilities Committee. "The bottom line is to get more work and get out there, get into the audition," she said.

For 20 years, the committee has been focused on getting actors with disabilities included in the annual Casting Data Report, released by SAG and the Alliance of Motion Picture and Television Producers. The report -- which calculates the number of opportunities in film and TV available for Caucasian, African-American, Asian, Latino, Native American, female, and senior actors -- serves as a kind of report card for the industry and can encourage casting directors to cast more minority performers.

PWD national chairman Robert David Hall, who plays Dr. Al Robbins on *CSI*: *Crime Scene Investigation*, said the absence of performers with disabilities from the report reflects Hollywood's reluctance to even consider writing roles for and casting these performers. "You'll see the occasional role about the pathetic disabled person or the incredibly inspirational person. But by and large, with very few exceptions -- I'm lucky to be one of them -- I think there is a discomfort with casting people with disabilities as moms, dads, cops, teachers, social workers -- as human beings who do their jobs," Hall said. Hall, who lost his legs as a result of an injury 30 years ago, likens the disability civil-rights movement to the African-American civil-rights movement, which changed Americans' perspectives of minorities in real life and in entertainment.

"There was a time when there weren't very many African Americans on television, Latino Americans, or Asian Americans. There definitely weren't any people with disabilities," said Hall. "I believe with all my heart that you really have to explore every segment of society to find quality people who are going to contribute."

However, actors with disabilities can't simply wait for attitudes to change. Hall said, "Any actor who sits around and waits to be discovered is a fool, and they won't have a career. That applies doubly for people with disabilities. You've got to seek out every avenue and opportunity there is. And if there isn't one, you've got to create one for yourself."

For tickets and information about Theatre Breaking Through Barriers, visit www.tbtb.org. Tickets for The History of Bowling will be available at www.thenohoartscenter.com. For a directory of theatres for disabled actors in the United States, go to www.dmoz.org/Society/Disabled/Arts/Theatre.

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http://www.backstage.com:80/bso/news_reviews/film/article_display.jsp?vnu_content_id=1003711445

Neanderthals Moved From Place To Place, Tooth Analysis Shows

The 40,000-year-old Neanderthal tooth that has given scientists the first direct evidence that Neanderthals moved from place to place during their lifetimes. (Credit: Max Planck institute for Evolutionary Anthropology)

ScienceDaily (Feb. 15, 2008) — A 40,000-year-old tooth has provided scientists with the first direct evidence that Neanderthals moved from place to place during their lifetimes. In a collaborative project involving researchers from the Germany, the United Kingdom, and Greece, Professor Michael Richards of the Max Planck institute for Evolutionary Anthropology in Leipzig, Germany and Durham University, UK, and his team used laser technology to collect microscopic particles of enamel from the tooth. By analysing strontium isotope ratios in the enamel - strontium is a naturally occurring metal ingested into the body through food and water - the scientists were able to uncover geological information showing where the Neanderthal had been living when the tooth was formed.

The tooth, a third molar, was formed when the Neanderthal was aged between seven and nine. It was recovered in a coastal limestone cave in Lakonis, in Southern Greece, during an excavation directed by Dr Eleni Panagopoulou of the Ephoreia of Paleoanthropology and Speleology (Greek Ministry of Culture). The strontium isotope readings, however, indicated that the enamel formed while the Neanderthal lived in a region made up of older volcanic bedrock. The findings could help answer a long-standing debate about the mobility of the now extinct Neanderthal species.

Some researchers argue that Neanderthals stayed in one small area for most of their lives; others claim their movements were more substantial and they moved over long distances; and others say they only moved within a limited area, perhaps on a seasonal basis to access different food sources.

Professor Richards said: "Strontium from ingested food and water is absorbed as if it was calcium in mammals during tooth formation. Our tests show that this individual must have lived in a different location when the crown of the tooth was formed than where the tooth was found. The evidence indicates that this Neanderthal moved over a relatively wide range of at least 20 kilometres or even further in their lifetime. Therefore we can say that Neanderthals did move over their lifetimes and were not confined to limited geographical areas."

"Previous evidence for Neanderthal mobility comes from indirect sources such as stone tools or the presence of non-local artefacts such as sea shells at sites far away from the coast. None of these provide a direct measure of Neanderthal mobility." said Dr Katerina Harvati of the Max Planck Institute, in Germany, who initiated the study.

The researchers believe the laser ablation technique used to collect the minute particles of enamel will allow the measurement of other rare Neanderthal remains to see how the result compares in other regions and at other time periods.

The technique could also allow scientists to look at very small scale migrations, which is not possible with traditional research methods, and could possibly be applied to research into early humans.

Journal reference and research team: Journal of Archaeological Science, February 11th, 2008. The research team, led by Professor Michael Richards of the Max Planck Society and Durham University, included Katerina Harvati, Vaughan Grimes, Colin Smith, Tanya Smith and Jean-Jacques Hublin, of the Max Planck Institute for Evolutionary Anthropology, Germany, and Panagiotis Karkanas and Eleni Panagopoulou of the Ephoreia of Palaeoanthropology-Speleology of Southern Greece.

The isotopic research was funded by the Max Planck Institute and the excavation of Lakonis was funded by the Greek Ministry of Culture, the Wenner-Gren Foundation, the LSB Leakey Foundation and the Institute for Aegean Prehistory.

Adapted from materials provided by Max-Planck-Gesellschaft.

http://www.sciencedaily.com:80/releases/2008/02/080215103148.htm

Non-Cancer Deaths More Common Among Breast Cancer Survivors

ScienceDaily (Feb. 15, 2008) — Breast cancer survivors, particularly older women, are at greater risk of death from non-cancer causes than from breast cancer.

As breast cancer treatments improve, patients are surviving longer, and many are dying of causes unrelated to breast cancer. Judith-Anne Chapman, Ph.D., and colleagues with the National Cancer Institute of Canada Clinical Trials Group investigated whether certain factors, such as pre-existing diseases, are associated with the risk of death from breast cancer, other cancers, or causes other than cancer. For about four years, the researchers followed over 5,000 women enrolled in a breast cancer trial.

During the follow-up, 256 participants died. Non-breast cancer deaths were more common than deaths from breast cancer, and older women, in particular, were more likely to die of other causes. While 60 percent of women in the trial died of causes not related to breast cancer, this figure jumped to 72 percent among women 70 years and older. Two factors were associated with cause of death. Women with pre-existing heart disease were more likely to die of non-cancer causes, and women with pre-existing osteoporosis were at greater risk of dying from cancers other than breast cancer. Women were more likely to die from breast cancer if cancer cells had spread to the lymph nodes.

"Routine use of screening mammography and improved therapeutic management of breast cancer...will mean that more women will survive breast cancer to older ages, at which they might have a higher risk of death from causes other than breast cancer," the authors write.

In an accompanying editorial, Sharon Giordano, M.D., and Gabriel Hortobagyi, M.D., of the University of Texas M. D. Anderson Cancer Center in Houston discuss the need for oncologists to consider a patient's pre-existing health problems when determining treatment options.

For example, "cardiovascular disease is of particular concern to breast cancer patients because of its prevalence and the reality that many therapies for breast cancer can cause cardiac dysfunction," the editorialists write.

Adapted from materials provided by Journal of the National Cancer Institute, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80/releases/2008/02/080212165429.htm

When People Feel Powerful, They Ignore New Opinions, Study Finds

ScienceDaily (Feb. 15, 2008) — Don't bother trying to persuade your boss of a new idea while he's feeling the power of his position – new research suggests he's not listening to you.

"Powerful people have confidence in what they are thinking.Whether their thoughts are positive or negative toward an idea, that position is going to be hard to change," said Richard Petty, co-author of a new study* and professor of psychology at Ohio State University.

The best way to get leaders to consider new ideas is to put them in a situation where they don't feel as powerful, the research suggests.

"If you temporarily make a powerful person feel less powerful, you have a better chance of getting them to pay attention," said Pablo Briñol, lead author of the study and a social psychologist at the Universidad Autónoma de Madrid in Spain. Briñol is a former postdoctoral fellow at Ohio State.

This research looks at an issue that has been largely ignored by social scientists, Petty said. Many studies have looked at how the power of a person delivering a message impacts those who receive it. But this appears to be the first study that looks at how the power of the message recipient affects persuasion.

In several related studies, the researchers told college students they would be participating in two supposedly separate experiments. In one experiment, the students role-played in a situation in which one was a boss – in other words, had a position of power – and the other was an employee who simply took orders.

In the second experiment, the participants viewed a fake advertisement for a mobile phone. The ad was designed to see if participants were paying attention to the message, so half the participants received ads with particularly weak arguments for buying the phone (for example, touting that it had a broad currency converter), while the others received strong arguments (the phone could be recharged in just 5 minutes). Participants were then asked to rate how favorably they viewed the phone.

When the role-playing exercise was conducted before viewing the phone ad, those who played boss were more likely than those playing employees to rate the phone similarly -- whether they received the strong or the weak arguments.

"The strength of the argument made no difference to those who played the boss – they obviously weren't paying attention when they felt powerful," Petty said. "Those who played the employee, who were made to feel powerless, paid a lot more attention to the arguments. They weren't as confident in their own initial beliefs and weighed the arguments more carefully."

In a related study, the order of the experiments was essentially reversed. Participants first read the mobile phone ads, and were presented with either the strong or the weak arguments, and wrote down their thoughts while reading it. However, before they actually rated the phones, the same participants took part in the role-playing exercise in which some were the boss and some the employee. Later, they went back and rated the phones.

The results showed that the bosses in the role-playing exercise were now more influenced by the quality of the arguments in the ads.. Those who were low-power employees were not as influenced by the ad quality.

"When power was experienced after the ads had been processed, it gave people confidence in their most recent thoughts, so if they read strong arguments, they rated the phones more favorably. If they read weak arguments, they were much more negative toward the phone," Petty said.

"Those who were feeling less power weren't as confident about the validity of their thoughts to the ads, so the strength of the arguments didn't matter as much."

What this all means is that it matters when people are feeling powerful – before or after they receive a persuasive message. If the message comes right after their power is made relevant to them, then powerful people will be difficult to persuade because they are confident in their existing opinions. However, if people can be made to feel powerful right after a strong persuasive message, attitude change is more likely because powerful individuals will feel confident in the positive thoughts they generate to the message, Petty said.

For example, if you have strong arguments to get a raise, try not to ask the boss in her office, where she is surrounded by the trappings of power. Bring up the topic in a lunch room or somewhere where there aren't reminders of who is in charge.

But if you do have to talk in the boss's office, try to say something that shakes his or her confidence.

"Our research shows that power makes people more confident in their beliefs, but power is only one thing that affects confidence," Petty said. "Try to bring up something that the boss doesn't know, something that makes him less certain and that tempers his confidence."

But once you do make your argument, assuming it is cogent, it is good to remind the boss that he is in charge.

"You want to sow all your arguments when the boss is not thinking of his power, and after you make a good case, then remind your boss of his power. Then he will be more confident in his own evaluation of what you say. As long as you make good arguments, he will be more likely to be persuaded," Petty said.

Petty said the research casts doubt on the classic assertion that power corrupts people and leads them to negative actions. Instead, what power does is make people more likely to unquestionably believe their own thoughts and act on them, he said.

Both low- and high-power people may have negative thoughts at times, and think about doing something bad. But because high-power people are more confident in their thoughts – and less susceptible to countering views – they are more likely to follow through into action.

"A lot of people may have a momentary thought about doing something bad, but they don't do it because they can inhibit themselves. A powerful person is more likely to follow through on the negative thoughts," Petty said.

By the same token, if a powerful person has a positive, pro-social thought, she may be more likely to follow through on that thought and turn it into reality.

"Powerful people are more likely to act on what they are thinking – good or bad – without second guessing themselves," Petty said.

*The study was published in a recent issue of the Journal of Personality and Social Psychology. Other co-authors of the study included Derek Rucker of Northwestern University, Carmen Valle of Universidad San Pablo CEU de Madrid and Alberto Becerra of Universidad Autónoma de Madrid.

Adapted from materials provided by Ohio State University.

http://www.sciencedaily.com:80/releases/2008/02/080214093135.htm

Discovery Could Help Reprogram Adult Cells To Embryonic Stem Cell-like State

Up to this point, the reprogramming process has been a virtual black box - scientists have been able to turn back the developmental clock on adult skin cells by introducing four genes into the cells, but they have not known what steps were occurring during the process. (Credit: iStockphoto/Sven Hoppe)

ScienceDaily (Feb. 15, 2008) — Harvard Stem Cell Institute (HSCI) and Massachusetts General Hospital (MGH) researchers have taken a major step toward eventually being able to reprogram adult cells to an embryonic stem cell-like state without the use of viruses or cancer-causing genes.

In a paper released online today by the journal Cell Stem Cell, Konrad Hochedlinger and colleagues report that they have discovered how long adult cells need to be exposed to reprogramming factors before they convert to an embryonic-like state, and have “defined the sequence of events that occur during reprogramming.”

This work on adult mouse skin cells should help researchers narrow the field of candidate chemicals and proteins that might be used to safely turn these processes on and off. This is particularly important because at this stage in the study of these induced pluripotent (iPS) cells, researchers are using cancer-causing genes to initiate the process, and are using retroviruses, which can activate cancer genes, to insert the genes into the target cells. As long as the work involves the use of either oncogenes or retroviruses, it would not be possible to use these converted cells in patients.

Up to this point, the reprogramming process has been a virtual black box - scientists have been able to turn back the developmental clock on adult skin cells by introducing four genes into the cells, but they have not known what steps were occurring during the process.

Harvard Stem Cell Institute Co-Director Doug Melton called the work “an impressive and thoughtful study” that "marks an important first step in finding ways to create pluripotent stem cells from adult cells without the need for viruses or oncogenes.”

Hochedlinger, an assistant professor in Harvard's new inter-school Department of Stem Cell and Regenerative Biology, and a leader in the study of iPS cells, is, like others, converting adult cells to an embryonic-like state, using four genes to bring about the conversion.

In this new Cell Stem Cell paper, he and his colleagues at MGH's Cancer Center and Center for Regenerative Medicine "have engineered new viral systems to introduce this into skin cells. With this new viral system we were able to control the behavior of these four genes."

When working with adult skin cells, he explains, "skin cell markers are turned off very early, in the first two or three days, and after eight or nine days," the point at which the cells become independent of the viruses used to insert the genes now used for reprogramming, "other pluripotency genes are activated. This is the first framework for zooming in on this process, and will allow us to ask what's happening at day five, day six, and so on."

"The importance of this finding is that it will tell us how long we need to throw chemicals or proteins on the cells for the programming to be effective," Hochedlinger said. "It could have been that these viruses are only necessary for two days, or three weeks," he continued, adding that "if you know a certain chemical, or protein, becomes dangerous after 10 days, but you'll only need to use it for eight days, you have learned something important.

"The other message," he said, "is that we found molecular cornerstones of the reprogramming process. Using a series of surface markers we've defined the sequence of events that occurs during the reprogramming. Up to this point it was unknown what the sequence of events occurring was. But using these markers, we have been able to define what happens during reprogramming."

The research was supported by the Harvard Stem Cell Institute, Konrad Hochedlinger's NIH Director's New Innovator Award, the Kimmel Foundation and the V Foundation.

Adapted from materials provided by Harvard University.

http://www.sciencedaily.com:80/releases/2008/02/080215130617.htm

Web Sites Influence Users, Even When They Don't Communicate Directly

ScienceDaily (Feb. 15, 2008) — Web surfers may get more than just the music, videos and news updates they were looking for when they log onto trendy next-generation sites such as Last.fm, YouTube and Digg, according to new research by a University of Illinois business professor.

Whether they know it or not, they also could be getting swayed -- toward musical genres that stretch their tastes or to video and news clips they might have overlooked without an endorsement by the masses, says business administration professor Mu Xia.

Xia says the seemingly impersonal voting, tagging, ratings and even music catalogs offered on so-called Web 2.0 sites can influence users, not unlike more traditional written commentaries posted on blogs and in chat rooms.

“This is a new way to communicate,” he said. “It basically opens up a new horizon for letting people know what other people think. Before I could only read what one person wrote. Now I know what everyone else thinks.”

Xia calls it “ballot box communications,” an offshoot of Web technology that provides a tally of what users are thinking even though they never communicate directly.

On popular Web sites such as YouTube and Digg, the new technology highlights videos and news stories based on rankings or mouse clicks, steering users to the most popular clips and sound bites.

“You could say it’s human nature. If I know a lot of people have chosen a particular video, I also want to experience that,” said Xia, lead researcher for the study that will appear in Communications of the ACM, a publication of the Association for Computing Machinery.

The influence also extends to music-sharing services, according to the study, which analyzed searches, browsing and other commands on a popular music-sharing site from 2001 through 2006. For example, the study showed demand for country music increased as other users began including more in their online inventories, while supplies of jazz and other genres dwindled as demand dipped.

Xia says the findings signal that users are swayed by the tastes of other users, whose online offerings create a sense of curiosity.

“If people see there’s a lot of it out there, they sense it must be popular and it makes them more apt to check it out. They want to see what all of the fuss is about,” he said.

Based on the case study, Xia says researchers should dig deeper into those evolving online communities to better gauge how they influence users and society.

“You could frame it as a new kind of communication that’s not as rich as other forms. But at the same time maybe it encourages people to participate more because it takes less effort, so the limited information exchange actually becomes an advantage,” Xia said. “We may not have time to post comments to 10 Web sites every day, but we can go to that many Web sites and share our opinions by clicking on things.”

The study, “Voice of the Crowd: Ballot Box Communications in Online Communities,” was co-written by Wenjing Duan of George Washington University School of Business and Yun Huang and Andrew B. Whinston of the Center for Research in Electronic Commerce at the University of Texas.

Adapted from materials provided by University of Illinois at Urbana-Champaign.

http://www.sciencedaily.com:80/releases/2008/02/080213150959.htm

Tough Breeds Of Livestock Disappearing: Saving Them Before It Is Too Late

Dr. Phil Sponenberg with a Spanish-style Choctaw horse. (Credit: John McCormick, Virginia Tech)

ScienceDaily (Feb. 17, 2008) — Phil Sponenberg, professor of pathology and genetics in the Virginia-Maryland Regional College of Veterinary Medicine, has spent more than 30 years working to make sure certain living pieces of history — some dating to the 15th century — don't become extinct.

Sponenberg's brand of living history comes in the form of various rare strains of livestock, which were involved in events like Christopher Columbus' discovery of the Caribbean Islands and the Spanish conquest of the Americas.

Sponenberg's involvement began with Choctaw horses when he was a college student, and has spread to other kinds of animals through the years. Ancestors of Choctaw horses, Colonial Spanish horses were brought to the Caribbean Islands by Columbus and to Mexico by Hernándo Cortés. The horses were stolen from Mexico and rapidly traded north by Pueblo Indians.

These horses were noted by Meriwether Lewis and William Clark during their expedition to explore the Pacific Northwest. In fact, the Spanish influence extended up to the Carolinas, across the Gulf Coast, and throughout the West.

"The Choctaws were one of the tribes displaced from Mississippi, and they took their livestock with them," Sponenberg says.

The breeding stock has dispersed and not everyone can recognize a rare breed when they have one. Sponenberg received a call about a short horse that was about to be gelded. It turned out that the small horse, Icki, was a Choctaw. "Icki was the end of his bloodline," says Sponenberg, who was able to buy the stallion and return him to a small herd to sire more Choctaw horses.

Sponenberg has also identified another group of the Spanish horses still in the South — "Marsh Tacky" horses, which were used to manage cattle and to chase wild hogs across swampy terrain.

Another Spanish livestock breed Sponenberg has run across in his travels is South Pineywoods cattle — also known as Florida Cracker Cattle. Small, rugged, horned, heat-tolerant, and disease-resistant, "these cattle are exquisitely adapted to this environment," Sponenberg says. They are also long-lived and productive.

Through the years, Sponenberg has also found more Spanish horses, cotton patch geese, old Spanish goats, and some locally adapted Spanish sheep.

In fact, Sponenberg himself is the owner of a Choctaw horse, and he raises Tennessee myotonic (fainting) goats. The goats are from two old lines from New Braunfels, Texas.

Saving rare breeds

Sponenberg says he loves field work — discovering a new pocket of preserved livestock, making friends, and working with the people who manage the animals. His success, he says, is a result of the friendships and interest he has created — but also because of the strategies he has developed through scientific research.

Along the way, Sponenberg has done work and published strategies specific to rare breeds conservation, documentation, and genetic management.

Now, the American Livestock Breeds Conservancy is providing technical support for recapturing certain animals for pure breeding. The Bureau of Land Management contacts him to identify Spanish-type horses in wild herds to help the bureau conserve the horses.

Sponenberg stays connected with conservation efforts and affiliations and works to establish new relationships. He has collaborated with the American Livestock Breeds Conservancy since 1978, and with Iberian researchers since the early 1990s.

As a result of his work, several new strains of horses have been added and excluded through detailed blood typing or DNA typing.

About other rare breeds

Pineywoods cattle

- remain from the earliest days of Spanish control of what is now the southeastern United States
- usefulness to local populations as sources of meat, milk, hides, and oxen persists today

Cotton patch geese

- used extensively to weed cotton fields in the early 1900s
- avidly consume grassy weeds and leave alone broad-leaved plants like cotton

Pine Tacky saddle horses

- local Spanish-type horses, found in the deep South
- only three have been discovered and identified to date

Gulf Coast or Native sheep

- adapted descendants of old family flocks from the coastal deep South
- trace back to an Iberian origin and are now being registered by the Gulf Coast Native Sheep Alliance

- A Boer goat descendant

Local goats

- early extinct, largely due to crossbreeding to the imported Boer goat
- identified strains are exquisitely adapted to the local area

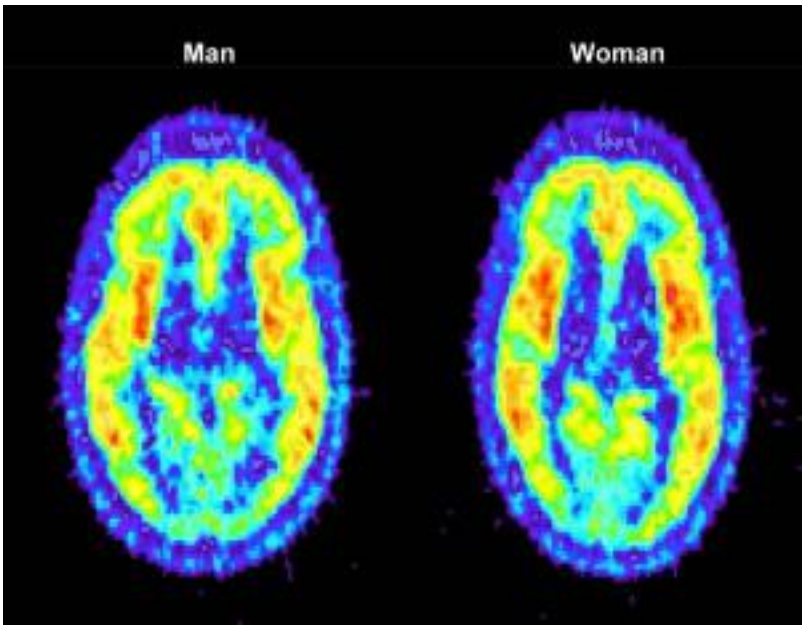
Swine

- remnants of an old Iberian type, usually black or grey in color, and poorly muscled
- historically desired as a source of lard and cured meat
- often earnotched, several have fused toes (mulefoot) and wattles (fleshy appendages) on the neck

Adapted from materials provided by Virginia Tech.

http://www.sciencedaily.com:80/releases/2008/02/080213104634.htm

Sex Differences In The Brain's Serotonin System



Sex differences in the brain's serotonin system. (Credit: Hristina Jovanovic)

ScienceDaily (Feb. 17, 2008) — A new thesis from he Swedish medical university Karolinska Institutet shows that the brain's serotonin system differs between men and women. The scientists who conducted the study think that they have found one of the reasons why depression and chronic anxiety are more common in women than in men.Serotonin is a brain neurotransmitter that is critical to the development and treatment of depression and chronic anxiety, conditions that, for reasons still unknown, are much more common in women than in men. A research group at Karolinska Institutet has now shown using a PET scanner that women and men differ in terms of the number of binding sites for serotonin in certain parts of the brain.

Their results, which are to be presented in a doctoral thesis by Hristina Jovanovic at the end of February, show that women have a greater number of the most common serotonin receptors than men. They also show that women have lower levels of the protein that transports serotonin back into the nerve cells that secrete it. It is this protein that the most common antidepressants (SSRIs) block."We don't know exactly what this means, but the results can help us understand why the occurrence of depression differs between the sexes and why men and women sometimes respond differently to treatment with antidepressant drugs," says associate professor Anna-Lena Nordström, who led the study.The group has also shown that the serotonin system in healthy women differs from that in women with serious premenstrual mental symptoms. These results suggest that the serotonin system in such women does not respond as flexibly to the hormone swings of the menstrual cycle as that in symptom-free women."These findings indicate that when developing antidepressants and anti-anxiety drugs, scientists should evaluate their effect on men and women separately, as well as their effects before and after menopause," says Ms Nordström.

Thesis: "PET evaluation of central serotonergic neurotransmission in women", Hristina Jovanovic Department of Clinical Neuroscience. The public defense will take place at 29 February at Karolinska University Hospital in Solna, Stockholm.

Adapted from materials provided by Karolinska Institutet.

http://www.sciencedaily.com:80/releases/2008/02/080213111043.htm

New Approach May Render Disease-causing Staph Harmless

U. of I. graduate student Fenglin Yin worked with Oldfield on the study. (Credit: Michael Hudock)

ScienceDaily (Feb. 16, 2008) — Researchers at the University of Illinois helped lead a collaborative effort to uncover a completely new treatment strategy for serious Staphylococcus aureus ("Staph") infections. The research, published Feb. 14 online in Science, comes at a time when strains of antibiotic-resistant Staph (known as MRSA, for methicillin-resistant S. aureus) are spreading in epidemic proportions in hospital and community settings.

Among the deadliest of all disease-causing organisms, Staph is the leading cause of human infections in the skin, soft tissues, bones, joints and bloodstream, and drug-resistant Staph infections are a growing threat. By federal estimates, more than 94,000 people develop serious MRSA infections and about 19,000 people die from MRSA in the U.S. every year. MRSA is believed to cause more deaths in the U.S. than HIV/AIDS.

The multi-institutional team exploited a chemical pathway that allows the Staph bacterium to defend itself against an immune response. The researchers showed that a compound (BPH-652) originally designed to lower cholesterol blocks a key enzyme in that pathway, weakening the organism's defenses and allowing the body's immune cells to prevail against the infection.

A golden-colored pigment called a carotenoid gives the S. aureus bacterium its edge. "Aureus" is Latin for "golden." The carotenoid acts as an antioxidant for the bacterium, allowing it to evade attack by the body's immune cells. By crippling production of the carotenoid, the compound strips Staph of one of its key defenses.

The new research builds on a recent discovery by scientists at the University of California, San Diego. The UCSD team, led by Dr. Victor Nizet, a professor of pediatrics and pharmacy, showed that knocking out a gene for an enzyme in the chemical pathway that produced the Staph carotenoid reduced its virulence.

When he read about this finding, University of Illinois chemistry professor Eric Oldfield realized that the chemical precursors of the Staph carotenoid were identical to those that led to production of cholesterol in

humans. Oldfield, who is the senior author of the paper, had spent decades exploring this pathway, which has implications for the treatment of some cancers, as well as fungal and parasitic diseases. He noted that an enzyme in the human pathway, squalene synthase, was strikingly similar to one that led to the production of the carotenoid in Staph. He also knew that many compounds already had been developed to block the human enzyme.

"I thought there was a good chance that squalene synthase inhibitors developed early on as cholesterol lowering agents might also work on this other pathway," he said. "Current cholesterol-lowering drugs like statins work in a completely different way and would be ineffective."

The researchers began by testing dozens of new compounds for their activity against the Staph enzyme. This allowed them to narrow the field of potential candidates to eight. When they tested these drugs on Staph cells, they found that BPH-652 was the most effective at getting into the cells. A tiny dose impaired the cells' ability to produce the carotenoid. The cells, once golden, turned white.

"We have found that the same golden armor used by Staph to thwart our immune system can also be its Achilles' heel," said Nizet, a study co-author, who is affiliated with the Skaggs School of Pharmacy and Pharmaceutical Sciences at UCSD.

Preliminary studies were conducted in the laboratories of Nizet and Dr. George Liu, a professor of pediatrics at Cedar-Sinai Medical Center. Exposure to BPH-652 also markedly reduced bacterial levels in a mouse model of severe Staph infection.

Because the approach reduces the virulence of the bacteria by stopping pigment production, it may not cause selective pressures on the population, which can lead to antibiotic resistance. It also targets only S. aureus, possibly reducing side effects.

The key to the compound's success is that the human and bacterial enzymes it targets are so similar. Andrew Wang and his colleagues at Academia Sinica and the National Taiwan University, both in Taipei, used X-ray crystallography to determine the structure of the enzyme and how it interacts with the inhibitors.

"Our structural studies pinpointed how these drug candidates bound to the bacterial enzyme to shut off pigment production," Wang said.

The new findings are particularly promising because BPH-652 already has been used (as a cholesterol-lowering agent) in human clinical trials, reducing the cost and time for development.

Adapted from materials provided by University of Illinois at Urbana-Champaign.

http://www.sciencedaily.com:80/releases/2008/02/080214144409.htm

A Ray Of Sunshine In The Fight Against Cancer: Vitamin D May Help

Dalhousie's Dr. Lousie Parker holds a vitamin D pill. (Credit: Danny Abriel.)

ScienceDaily (Feb. 16, 2008) — It sounds too good to be true … a little inexpensive pill that could block the development of some cancers, strengthen bones, prevent multiple sclerosis and alleviate winter depression.

But it's not science fiction. The "new aspirin" could be Vitamin D. Just as we discovered that aspirin can guard against heart disease, Vitamin D could become a useful weapon in the fight against MS, osteoporosis, mild depression and one of the most devastating diseases of our time – cancer.

"As time has gone by, Vitamin D has raised its head as a sort of ambrosia for cancers," says Dr. Louise Parker, an epidemiologist and a world expert in the environmental exposures that can lead to cancer. Or, in the case of Vitamin D, the lack of exposure.

"One of the most important sources of Vitamin D is from the sun and through your skin," says Dr. Parker.

"Many parts of Canada don't get much sun in the winter. We've also been telling people to cover up and use sunscreen to prevent skin cancer. Sunscreen actually impairs your (skin's ability) to make Vitamin D."

So the Canadian Cancer Society recommends that during the winter, Canadians take at least 1,000 units a day of Vitamin D, dubbed "the sunshine vitamin."

Dr. Parker says 1,000 units a day is well beyond what you can obtain from your diet. Vitamin D is a bit of a rare vitamin, appearing only in fatty fish, cod liver oil and egg yolks. Even if you were to sunbathe in southern climates, you would not take in 1,000 units.

"If you were to lie naked on a beach in the Bahamas, and I don't recommend that because of skin cancer, you cannot get up to the equivalent of 1,000 units of Vitamin D a day," says Dr. Parker.

She notes Vitamin D as a factor is turning up in study after study. It turns out people with lung and colon cancer are Vitamin D deficient. And it helps the body absorb calcium. In a study examining whether women who took Vitamin D had a lower risk of osteoporosis, it was found the women taking Vitamin D had stronger bones than those who did not take the vitamin. Years later, researchers went back to that study and found that the women who took Vitamin D also had fewer cancers.

But before Vitamin D becomes the "new aspirin," more research needs to be carried out.

Vitamin D works in very complicated ways, she says. It changes the way cells work. In fact, there is medical speculation that it may block cancer cell proliferation or improve immune system functions. But its role is not fully understood.

Lifestyle also has to be part of the equation. Dr. Parker is looking at how obesity, which we know can cause cancer, and exercise, which we know prevents cancer, could interact with Vitamin D. "At the population level, I am trying to understand how all these things fit together," says Dr. Parker. "It's very complex." Dr. Parker describes it as looking for a piece of a jigsaw puzzle. "We know some of the jigsaw pieces, but not all," she says.

Meanwhile, there is very little evidence that taking Vitamin D can harm you. Perhaps in huge doses it could cause kidney stones, but that has not been proven.

"On the average, 1,000 units a day is safe and is probably effective in reducing the risk of colon cancer, and maybe other cancers as well," says Dr. Parker.

So does she take Vitamin D and recommend it? Absolutely. "I take 1,000 units of Vitamin D – one day on and one day off," she says.

Adapted from materials provided by Dalhousie University, via Newswise.

http://www.sciencedaily.com:80/releases/2008/02/080206210402.htm

Managing Cattle Operations To Protect Lakes And Rivers From Pollution

Brahman heifers. (Credit: Photo by Peggy Greb)

ScienceDaily (Feb. 16, 2008) — Concerns about long-term effects of beef cattle browsing more than 11 million acres of Florida grazinglands led Agricultural Research Service (ARS) scientists to examine soil fertility changes in bahiagrass-based beef cattle pastures from 1988 to 2002. Analysis of data from that research shows that cattle can be managed in an environmentally safe way, despite the large quantities of waste the animals generate.

Forage-based livestock systems have been cited as a major cause of deteriorating water quality in Florida and other cattle-producing states. Phosphorus runoff from manure and fertilizers applied to enhance forage production can pollute rivers and lakes. However, very limited data have been available to quantify nutrient losses to adjacent bodies of water from pastures managed for grazing and hay production.

For this long-term monitoring study, the pastures were managed for spring grazing and late- summer haying. Soil scientist Gilbert C. Sigua and colleagues in the ARS Beef Cattle Research Unit in Brooksville, Fla., monitored changes in soil nutrients. The data they generated enabled them to predict soil chemical and physical changes likely under continuous forage-livestock cultivation, and to devise measures to manage them.

Testing was done in three large pasture units with a combined area of about 3,800 acres, of which about 3,200 acres were in permanent pasture. The herd used in the study—about 1,000 cows, bulls and calves—is maintained for nutritional, reproductive and genetic research at Brooksville.

Overall, there was no buildup of soil phosphorus or other crop nutrients, despite the annual application of fertilizers and daily in-field loading of animal waste. Periodic soil analysis showed declining nutrient levels, especially of phosphorus.

Next, Sigua and other collaborators will integrate environmental, plant and animal genetic resources into a sustainable beef cattle-agroecosystem suitable for the subtropical United States. The goal is to optimize forage-based cow-calf operations to improve pasture sustainability and protect water quality.

Adapted from materials provided by US Department of Agriculture.

http://www.sciencedaily.com:80/releases/2008/02/080212194959.htm

Early Mars 'too salty' for life

By Helen Briggs
BBC science reporter, Boston

The Red Planet was too salty to sustain life for much of its history, according to the latest evidence gathered by one of the US rovers on Mars' surface.

High concentration of minerals in water on early Mars would have made it inhospitable to even the toughest microbes, a leading Nasa expert says.

Clues preserved in rocks that were once awash with water suggest the environment was both acidic and briny.

The observations were made by the US space agency's Opportunity rover.

It has spent months examining rocks on an ancient Martian plain.

'Ghost of a chance'

Dr Andrew Knoll, a member of the rover science team, and a biologist at Harvard University, Cambridge, US, said the finding "tightens the noose on the possibility of life".

Speaking at the annual meeting of the American Association for the Advancement of Science (AAAS) in Boston, he said conditions on Mars in the past four billion years would have been very challenging for life.

"It was really salty - in fact, it was salty enough that only a handful of known terrestrial organisms would have a ghost of a chance of surviving there when conditions were at their best," he explained.

The US Mars rovers - Opportunity and its twin, Spirit - have now spent more than 1,400 days on the Martian surface.

As their work comes to an end, Nasa has its hopes set on the Phoenix lander, which is due to reach Mars on 25 May.

The Phoenix mission will land near the planet's north pole, and aim to dig under the frozen surface in search of signs of microbial life, past or present.

The next-generation rover, the Mars Science Laboratory (MSL), is set to leave Earth in 2009, and land in 2010.

Twice as long and three times as heavy as Spirit and Opportunity, it will collect Martian soil and rock samples, and analyse them for organic compounds.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7248062.stm

Published: 2008/02/15 22:27:26 GMT

Green watchdog urges store reform

By Roger Harrabin
BBC News environment analyst

An over-arching policy on supermarkets is needed if the government is to meet targets on obesity, waste and climate change, an independent report has said.

The Sustainable Development Commission (SDC) report suggests the food chain contributes about one-fifth of total UK greenhouse gas emissions.

It admits supermarkets are improving performance in many ways, but calls for clear government policy guidance.

The British Retail Consortium said chains were dealing with the issues.

The SDC accepts there is a need to put the responsibility on to government to create clear policy guidance so the retail giants can decide where their priorities should lie.

The report suggests the food chain contributes around one-fifth of total UK greenhouse gas emissions when the impact of fertilisers, transport, processing and rotting waste is taken into account.

It also quotes from a study which claims food is a family's biggest source of greenhouse gas emissions.

And the SDC blames stores for exacerbating global poverty and promoting unhealthy lifestyles.

Professor Tim Lang, the report¿s main author, told BBC News: "When we go shopping, I don't think we really recognise the enormous impact our food is having on the environment.

"It... has an impact on our health, the energy use, how we get there - everything that matters is actually happening beyond our control, but government's got to get grip of that."

The report follows the publication on Friday of the Competition Commission's review of British supermarkets.

It has recommended measures to stop chains restricting who can buy land they have sold off and the creation of an ombudsman to resolve disputes between supermarkets and their suppliers.

Jane Milne from the British Retail Consortium said: "There is a lot happening among all the major supermarkets in helping address healthy eating, in meeting the climate change challenge, in dealing with waste and all of these issues.

"But in order for all of that to happen we need some help from government as well."

Points of tension

The SDC acknowledges that supermarkets have moved towards producing healthier meals with lower fat and salt, but complains that they still promote two-for-one offers on junk food like doughnuts.

This may be helpful to people with large families on low incomes but it also encourages people to over-eat or to throw food away.

IMPACT OF FOOD

5.2m tonnes food-related packaging generated each year in the UK
6.7m tonnes food waste created each year by UK homes
Agriculture globally consumes 70% of all freshwater for human use
Proportion of men classified as obese has increased from 13% to 22%
Economic cost of obesity to the UK economy estimated at £10bn a year
Source: Sustainable Development Commission

It says the government must not sidestep points of tension - like the desire to promote the eating of fish at a time when global fish stocks are in decline.

It says a policy to "aim purely for quantity of supply or cheapness at all costs would be hopelessly inadequate".

The government has previously wondered whether it is necessary to devise a policy for supermarkets specifically.

However, the SDC says it has discovered that supermarkets are already affected by 19 Whitehall departments.

These cover almost 100 policy areas and responsibilities from animal welfare and congestion charging to planning, diet and nutrition.

It would help the supermarkets if ministers could offer one coherent policy.

The SDC was particularly critical of the failure of the Department for Transport to produce polices that cut emissions from deliveries and shopping trips.

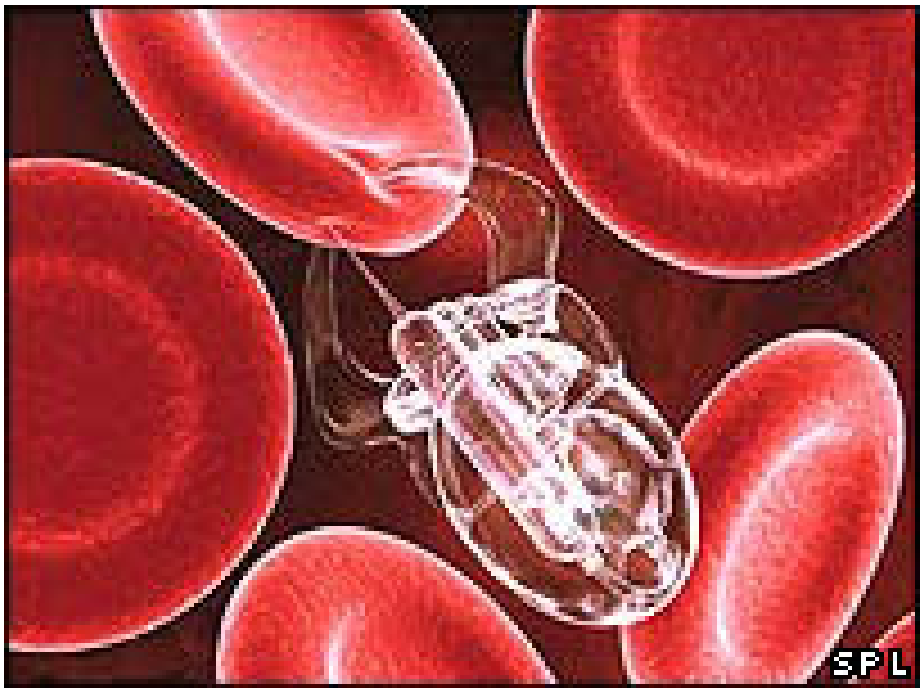
It says existing difficulties with enforcing current regulations - such as on excess packaging - need to be addressed urgently.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7247384.stm

Published: 2008/02/16 00:08:53 GMT

Machines 'to match man by 2029'

By Helen Briggs
Science reporter, BBC News, Boston



Machines will achieve human-level artificial intelligence by 2029, a leading US inventor has predicted.

Humanity is on the brink of advances that will see tiny robots implanted in people's brains to make them more intelligent, said Ray Kurzweil.

The engineer believes machines and humans will eventually merge through devices implanted in the body to boost intelligence and health.

"It's really part of our civilisation," Mr Kurzweil explained.

"But that's not going to be an alien invasion of intelligent machines to displace us."

Machines were already doing hundreds of things humans used to do, at human levels of intelligence or better, in many different areas, he said.

Man versus machine

"I've made the case that we will have both the hardware and the software to achieve human level artificial intelligence with the broad suppleness of human intelligence including our emotional intelligence by 2029," he said.

> **We'll have intelligent nanobots go into our brains... to make us smarter**
> Ray Kurzweil

"We're already a human machine civilisation; we use our technology to expand our physical and mental horizons and this will be a further extension of that."

Humans and machines would eventually merge, by means of devices embedded in people's bodies to keep them healthy and improve their intelligence, predicted Mr Kurzweil.

"We'll have intelligent nanobots go into our brains through the capillaries and interact directly with our biological neurons," he told BBC News.

The nanobots, he said, would "make us smarter, remember things better and automatically go into full emergent virtual reality environments through the nervous system".

Mr Kurzweil is one of 18 influential thinkers chosen to identify the great technological challenges facing humanity in the 21st century by the US National Academy of Engineering.

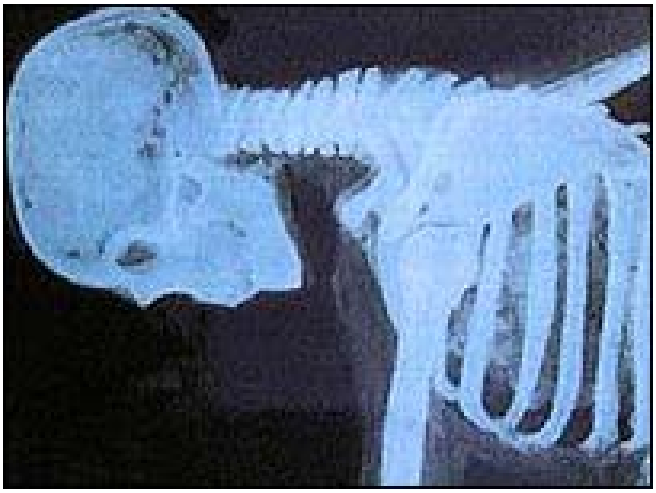
The experts include Google founder Larry Page and genome pioneer Dr Craig Venter.

The 14 challenges were announced at the annual meeting of the American Association for the Advancement of Science in Boston, which concludes on Monday.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/americas/7248875.stm

Published: 2008/02/16 19:38:32 GMT

Spinal injury regeneration hope
Scientists believe they are close to a significant breakthrough in the treatment of spinal injuries.



The University of Cambridge team is developing a treatment which could potentially allow damaged nerve fibres to regenerate within the spinal cord.

It may also encourage the remaining undamaged nerve fibres to work more effectively.

Spinal injuries are difficult to treat because the body cannot repair damage to the brain or spinal cord.

> **We are very hopeful that at last we may be able to offer paralysed patients a treatment to improve their condition**
> Professor James Fawcett
> University of Cambridge

Although it is possible for nerves to regenerate, they are blocked by the scar tissue that forms at the site of the spinal injury.

The Cambridge team has identified a bacteria enzyme called chondroitinase which is capable of digesting molecules within scar tissue to allow some nerve fibres to regrow.

The enzyme also promotes nerve plasticity, which potentially means that remaining undamaged nerve fibres have an increased likelihood of making new connections that could bypass the area of damage.

Boosts rehabilitation

In preliminary tests, the researchers have shown that combining chondroitinase with rehabilitation produces better results than using either technique alone.

> **What often happens in a clinical setting is that you don't get to see the results you would have liked**
> Paul Smith
> Spinal Injuries Association

However, trials have yet to begin in patients.

Lead researcher Professor James Fawcett said: "It is rare to find that a spinal cord is completely severed, generally there are still some nerve fibres that are undamaged.

"Chondroitinase offers us hope in two ways; firstly it allows some nerve fibres to regenerate and secondly it enables other nerves to take on the role of those fibres that cannot be repaired.

"Along with rehabilitation we are very hopeful that at last we may be able to offer paralysed patients a treatment to improve their condition."

'Ground-breaking'

Dr Yolande Harley, of the charity Action Medical Research which funded the work, said: "This is incredibly exciting, ground-breaking work, which will give new hope to people with recent spinal injuries."

Paul Smith, of the Spinal Injuries Association, said medical advances meant that spinal injuries had ceased to be the terminal conditions that they often once were, but they still had a huge impact on quality of life.

However, he warned against raising expectation before the treatment was fully tested on patients.

He said: "What often happens in a clinical setting is that you don't get to see the results you would have liked."

In the UK there are more than 40,000 people suffering from injuries to their spine, which can take the form of anything from loss of sensation to full paralysis.

The average age at the time of injury is just 19.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7240898.stm

Published: 2008/02/17 00:01:25 GMT

Planet-hunters set for big bounty

By Helen Briggs
Science reporter, BBC News, Boston

Rocky planets, possibly with conditions suitable for life, may be more common than previously thought in our galaxy, a study has found.

New evidence suggests more than half the Sun-like stars in the Milky Way could have similar planetary systems.

There may also be hundreds of undiscovered worlds in outer parts of our Solar System, astronomers believe.

Future studies of such worlds will radically alter our understanding of how planets are formed, they say.

New findings about planets were presented at the American Association for the Advancement of Science (AAAS) in Boston.

Nasa telescope

Michael Meyer, an astronomer from the University of Arizona, said he believed Earth-like planets were probably very common around Sun-like stars.

> **I expect that we will find a very large number of planets**
> Alan Stern, Nasa

"Our observations suggest that between 20% and 60% of Sun-like stars have evidence for the formation of rocky planets not unlike the processes we think led to planet Earth," he said. "That is very exciting."

Mr Meyer's team used the US space agency's Spitzer space telescope to look at groups of stars with masses similar to the Sun.

They detected discs of cosmic dust around stars in some of the youngest groups surveyed.

The dust is believed to be a by-product of rocky debris colliding and merging to form planets.

Nasa's Kepler mission to search for Earth-sized and smaller planets, due to be launched next year, is expected to reveal more clues about these distant undiscovered worlds.

Frozen worlds

Some astronomers believe there may be hundreds of small rocky bodies in the outer edges of our own Solar System, and perhaps even a handful of frozen Earth-sized worlds.

> **We have to find the right mass planet and it has to be at the right distance from the star**
> Debra Fischer, San Francisco State University

Speaking at the AAAS meeting, Nasa's Alan Stern said he thought only the tip of the iceberg had been found in terms of planets within our own Solar System.

More than a thousand objects had already been discovered in the Kuiper belt alone, he said, many rivalling the planet Pluto in size.

"Our old view, that the Solar System had nine planets will be supplanted by a view that there are hundreds if not thousands of planets in our Solar System," he told BBC News.

He said many of these planets would be icy, some would be rocky, and there might even be objects with the same mass as Earth.

"It could be that there are objects of Earth-mass in the Oort cloud (a band of debris surrounding our planetary system) but they would be frozen at these distances," Dr Stern added.

"They would look like a frozen Earth."

Goldilocks zone

Excitement about finding other Earth-like planets is driven by the idea that some might contain life or perhaps, centuries from now, allow human colonies to be set up on them.

The key to this search, said Debra Fischer of San Francisco State University, California, was the "Goldilocks zone".

This refers to an area of space in which a planet is "just the right distance" from its parent star so that its surface is not-too-hot or not-too-cold to support liquid water.

"To my mind there are two things we have to go after: we have to find the right mass planet and it has to be at the right distance from the star," she said.

The AAAS meeting concludes on Monday.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7249884.stm

Published: 2008/02/17 21:51:42 GMT

Side-effects 'should be reported'
A campaign has been launched to get members of the public to report any side-effects they experience after taking medicines.

The Medicines and Healthcare Regulatory Authority (MHRA) wants pharmacists to promote and make better use of the "Yellow Card" scheme.

The scheme, which includes online reporting, was set up in 1964 in the wake of the Thalidomide tragedy.

It has since helped detect dozens of unexpected side-effects.

> **If you suspect that you have had a side-effect to your medicine, please tell us about it via the Yellow Card scheme**
> Dr June Raine
> MHRA

While drugs are heavily tested prior to release, some "adverse effects" may not be spotted, or the medicine may interact with other drugs or even foods in an unexpected way.

Reports on the Yellow Card scheme helped scientists find out that cranberry juice could weaken the effects of warfarin, one of the most commonly prescribed blood thinning drugs.

In 2001, other Yellow Card reports revealed a connection between smoking cessation drug Zyban and seizures.

The MHRA also wants community pharmacists to file more reports on drug reactions to them.

Most of the 20,000 reports every year come directly from doctors, but only a few hundred from community pharmacists.

Simpler system

Dr June Raine, from the MHRA, said: "We are keen to let people know that whilst their medicines have important benefits, they may also have unwanted side-effects.

"If you suspect that you have had a side-effect to your medicine, please tell us about it via the Yellow Card scheme."

Why wasn't my father warned about the dangers of taking this drug?
Amanda Cale, whose father died from an adverse reaction to a prescription drug

She said that members of the public could either pick up a reporting form from their pharmacist, file a report online, or speak to the pharmacist to help guide them through the process.

A spokesman for the MHRA stressed that they were interested to hear about any side-effect, including side-effects already mentioned by the doctor or covered by the drug packaging.

Shelley Flanagan suffered side-effects after using antibiotics to treat pneumonia.

She said: "I would encourage anyone who believes they have had a side-effect to a medicine to fill out a Yellow Card like I did, or report online."

A spokesman for the National Pharmacy Association, which represents community pharmacists, said that it welcomed the campaign.

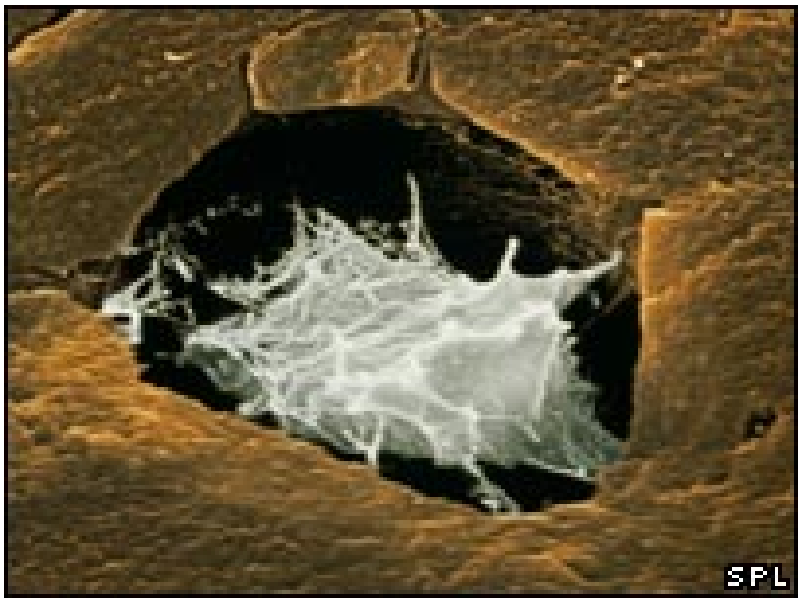
"Yellow Cards certainly used to be the domain of just the healthcare professional, but I think the MHRA have now made them much easier to use for the public.

"We wholeheartedly support this and are encouraging our members to promote the scheme."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7247681.stm

Published: 2008/02/18 00:03:57 GMT

Stem cell hope for bone fractures
UK scientists hope to mend shattered bones and damaged cartilage using a patient's own stem cells.



They are developing a "bioactive scaffold" to protect the stem cells and encourage them to grow into bone or cartilage when placed in the body.

The Edinburgh University team hope the technique, which uses stem cells from blood and bone marrow, will be tested in patients within two years.

Surgeons said it could help repair trauma injuries too severe to heal.

> **A lot of research that has gone before is working out what will drive them down the route to become a specific cell type**
> Dr Brendon Noble

The £1.4m project could also eventually have an impact on treating conditions such as osteoarthritis.

Dr Brendon Noble, who works in the University of Edinburgh's MRC Centre for Regenerative Medicine said initially they would look at mending cartilage injuries which do not tend to heal well or bone fractures caused by severe trauma such as motorbike accidents.

Elderly patients with fractures also tend to heal less well, he said.

'**Recipe**'

The key to success would be to get the "recipe" right for encouraging the stem cells to grow in what are effectively harsh environments, he explained.

"A lot of research that has gone before is working out what will drive them down the route to become a specific cell type.

"The next stage is trying to think of innovative ways to encourage them to do that in the body - often we can do things in the laboratory and that's easy but we tend to forget that the cells in the patient were not happy in the first place."

The scaffold consists of a fairly rigid mesh structure, coated or impregnated with a drug that helps the stem cells take hold.

As well as using stem cells from bone marrow, Dr Noble's team is working with the Scottish National Blood Transfusion Service to culture bone forming cells from blood.

This would mean the patient does not have to undergo surgery to harvest the cells.

Dr Noble added: "Half of us will have orthopaedic surgery in our lifetime.

"We are also living longer and want to remain more active in later life so such problems are going to become more prominent and more expensive."

Professor Chris Moran, member of the British Orthopaedic Association and expert in trauma surgery at the University of Nottingham, said this kind of research meant in the future surgeons might be able to repair trauma injuries too severe to heal by current techniques and even replace bone lost to cancer.

But he added: "In order to move this technology from the laboratory to the operating theatre, the scaffold will need to be compatible with the human body and resist rejection."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7246968.stm

Published: 2008/02/18 00:03:00 GMTWarming Waters May Make Antarctica Hospitable To

Sharks: Potentially Disastrous Consequences

Spiny dogfish shark in test tank. URI biology professors Cheryl Wilga and Brad Seibel analyzed the physiological adaptations and metabolism of sharks and other warm-water predators and concluded that an increase of just a few degrees Celsius could make Antarctic waters hospitable to some species. (Credit: Anabela Maia)

ScienceDaily (Feb. 19, 2008) — It has been 40 million years since the waters around Antarctica have been warm enough to sustain populations of sharks and most fish, but they may return this century due to the effects of global warming. If they do, the impact on Antarctic ecology could be serious, according to researchers from the University of Rhode Island.

URI biology professors Cheryl Wilga and Brad Seibel analyzed the physiological adaptations and metabolism of sharks and other warm-water predators and concluded that an increase of just a few degrees Celsius could make Antarctic waters hospitable to some species.

“There are few prey-crushing predators in Antarctic waters. As a result, the Antarctic seafloor has been dominated by relatively soft-bodied, slow-moving invertebrates, just as in ancient oceans prior to the evolution of shell-crushing predators.” said Wilga.

She also noted that ocean-going sharks have a high metabolism rate because they must swim constantly to aerate their gills, and they use a great deal of energy just to keep moving. The cold waters around Antarctica may slow their metabolism too much for them to survive.

Benthic sharks -- those that live on the seafloor and swim very little – have a lower metabolism rate and can survive in water 7 to 10 degrees Celsius, but almost all benthic sharks currently are found in shallow temperate to tropical waters. Since they cannot swim great distances and do not produce a larval stage capable of wide dispersal, it is unlikely they could easily get to Antarctica on their own.

According to Seibel, sharks accumulate trimethylamine oxide (TMAO) as part of their normal body functions, and their body’s demand for it is even greater at cold temperatures and at high pressures, like are found in deep trenches around Antarctica. “It may be that the required levels of TMAO reach an upper limit that excludes sharks from entering Antarctic waters,” he said. “Interestingly, sharks are not found in the Antarctic or globally at depths below about 3,000 meters either.”

The waters around the Antarctic Peninsula remain within a few degrees of freezing year round, but in the last 50 years the temperature there has increased by 1 to 2 C, which is about double or triple the global average.

“The water only needs to remain above freezing year round for it to become habitable to some sharks, and at the rate we’re going, that could happen this century,” Wilga said. “Once they get there, it will completely change the ecology of the Antarctic benthic community.”

While they don’t believe that the arrival of sharks and shell-crushing bony fishes in Antarctica will lead to widespread species extinctions, Wilga and Seibel say that it will certainly lead to dramatic changes in the

population numbers and proportions of species found there. Shrimp, ribbon worms and brittle stars will likely be the most vulnerable to population declines.

"Ice fishes – the only bony fish that now lives in Antarctic waters, because it has antifreeze in its system – will face a new threat as well," Wilga added. "They are already preyed upon by seals and penguins. Adding sharks and other bony fishes to the mix will likely have a big affect on them."

Crabs, another predator that has been absent from Antarctic waters for millions of years, are also likely to make a comeback. The cold Antarctic water reduces their ability to flush magnesium from their blood, leading to magnesium narcosis and death. But the warming sea temperatures around Antarctica have already led some predatory crabs to move closer and closer to the Antarctic shelf environment.

The study, "None Like It Cold: Physiological Constraints on Predators in Antarctica," was presented February 15 in Boston at the annual meeting of the American Association for the Advancement of Science.

Adapted from materials provided by University of Rhode Island.

http://www.sciencedaily.com:80/releases/2008/02/080217220939.htm

National Biomass And Carbon Dataset Now Available For US

Map illustrating progress toward completion of the National Biomass and Carbon Dataset for the year 2000. (Credit: Greg Fiske, Wayne Walker, Josef Kellndorfer, Woods Hole Research Center)

ScienceDaily (Feb. 19, 2008) — Scientists at the Woods Hole Research Center working to produce the "National Biomass and Carbon Dataset" for the year 2000 (NBCD2000) are releasing data from nine project mapping zones. Through a combination of NASA satellite datasets, topographic survey data, land use/land cover information, and extensive forest inventory data collected by the USDA Forest Service -- Forest Inventory and Analysis Program (FIA), NBCD2000 will provide an invaluable baseline for quantifying the carbon stock in U.S. forests and will improve current methods of assessing the carbon flux between forests and the atmosphere.

According to Dr. Josef Kellndorfer, an associate scientist at the Center and project leader, "The availability of a high resolution dataset containing estimates of forest biomass and associated carbon stock is an important step forward in enabling researchers to better understand the North American carbon balance."

As part of the NBCD2000 initiative, begun in 2005 and funded by NASA's Earth Science Program with additional support from the USGS/LANDFIRE, mapping is being conducted within 67 ecologically diverse regions, termed "mapping zones", which span the conterminous United States. Of the nine completed zones, 5 were finished during a 2-year pilot phase. Work on the remaining zones will be completed at a rate of roughly one zone every seven days. The project is scheduled for completion in early 2009.

Wayne Walker, a research associate at the Center who is also working on the project adds, "The data sets that are now available should be of interest to natural resource managers across the U.S. For the first time, high resolution estimates of vegetation canopy height and biomass are being produced consistently for the entire conterminous U.S."

Within each mapping zone data from the 2000 Shuttle Radar Topography Mission are combined with topographic survey data from the National Elevation Dataset (NED) to produce a radar-based map of vegetation canopy height. Subsequently, the map is used to generate estimates of actual vegetation height, biomass, and carbon stock using survey data from the U.S. Forest Service -- FIA program and ancillary data sets from the National Land Cover Database 2001 (NLCD2001) project. The NLCD2001 data layers

are crucial inputs to the NBCD2000 project as they provide land cover and canopy density information used in the stratification/calibration process.

Diane Wickland, the program manager for NASA's Terrestrial Ecology Program, comments,

"Because this is the first systematic, regional-scale study that uses radar data to quantify carbon storage in vegetation, the end result will not only provide valuable information on how well we can do with existing data, but will allow us to see how we might improve and refine requirements for future, more capable missions like DESDynI, which has been recommended by the National Research Council Decadal Survey on Earth Observation."

All NBCD2000 data products are being made available for download on a zone-by-zone basis and free of charge from the NBCD2000 project website located at http://www.whrc.org/nbcd.

Adapted from materials provided by Woods Hole Research Center, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80/releases/2008/02/080214130401.htm

Living Corals Thousands Of Years Old Hold Clues To Past Climate Changes

Black coral. Some deep-water black coral specimens (Leiopathes glaberrima) have life spans in excess of 4,000 years. Some of these corals began growing just a few hundred years after the great pyramids were built and are still alive today. (Credit: iStockphoto/Jerry Carpenter)

ScienceDaily (Feb. 19, 2008) — New research shows that the second most diverse group of hard corals first evolved in the deep sea, and not in shallow waters. Stylasterids, or lace corals, diversified in deep waters before launching at least three successful invasions of shallow water habitats in the past 30 million years. This finding contradicts a long-established theory that suggests corals and other marine animals all evolved in shallow water before migrating into deeper habitats.

"When we look at the DNA and fossils of these animals, we can trace how these transitions from deep water to shallow habitats have popped up in different parts of the family at different points in time," says Alberto Lindner, a coral researcher at the University of São Paulo, Brazil. "We also see this story unfold in which the corals are building skeletal defenses in what looks like a long-running arms race with their predators. Together, it shows us how wrong it is to think of deep-sea ecosystems as being isolated and static."

Regardless of where they evolved, the corals living in these habitats continue to surprise researchers. "Deep-sea corals can be spectacularly long-lived, which makes them critical contributors to our efforts to understand the past," says Brendan Roark, a paleoceanographer at Stanford University. "Our radiocarbon dating shows that some species have life spans of over 4000 years. That means some coral colonies have been alive since Stonehenge was erected. These animals are living antiquities."

Many corals grow their skeletons in a manner similar to tree trunks, laying down growth rings that become historical archives of the water conditions over time. Analyzing the chemical composition of these layers allows researchers to trace changes in ocean circulation and temperature over hundreds to thousands of years. Such historical reconstructions are critical for understanding how climate change occurred in the past, and for making predictions about the future. The coral might further our understanding, for example, of how the oceans absorb carbon dioxide from the atmosphere.

"These organisms are the equivalent of the bristlecone pine in the deep ocean," he said. They are placed in jeopardy not only by coral harvesters but also by deep-sea trawling and long-line fishing. "Clearly a different frame of mind is needed," he said. "It's not a renewable resource."

Roark and his associates found that Gerardia, commonly known as gold coral, can live for at least 2,700 years. It grows in tree-like fashion to several meters in height. Even older is the deep-water black coral Leiopathes glaberrima. Another tree-like skeleton, it has life spans in excess of 4,000 years--some of these corals began growing just a few hundred years after the great pyramids were built in Giza and are still alive today.

Roark's finding on growth rates and longevity also challenge the adequacy of old models upon which the management of deep-sea coral species are based. "Growth rates have been overestimated by an order of magnitude in some fisheries management plans. Our new understanding of the great longevity of some of these species strongly suggests the need for more rigorous measures to ensure their populations are adequately protected."

Research in these habitats is expensive and difficult, often leading to studies that are geographically constrained and impossible to compare. In an attempt to overcome these challenges, J. Murray Roberts of the Scottish Association for Marine Science will unveil plans for a novel international scientific program called the Trans-Atlantic Coral Ecosystem Study (TRACES).

The project will be the first to trace the flow of genes and animals across the seafloor communities of an entire ocean basin. TRACES researchers from Canada, the U.S., and the European Union will conduct exploratory cruises across the North Atlantic to study the environmental and ecological history of deep-sea communities beginning in late 2008.

Whereas Lindner's work is concerned with how species evolved in the distant past, the TRACES geneticists are focused on tracking relatively recent changes in populations. Other TRACES researchers will expand upon Roark's work; by collecting a large library of the isotope records stored in coral skeletons, they will be able to study historical climate change and create new models with better resolution than ever before.

"We must cross national boundaries to understand deep-sea coral ecosystems. The only way we can work out how to protect deep-sea corals is to understand how they are distributed and connected," Roberts says. "Since we started work on TRACES we've been amazed at the response of the scientific community. Over 100 scientists are already involved and our first meetings are over-subscribed. Everyone agrees we owe it to future generations to make sure these unique ecosystems are protected by conservation plans based on sound science."

Researchers will discuss these and other new discoveries about deep-sea corals at the American Association for the Advancement of Science (AAAS) Annual Meeting in Boston, MA,February 14 and 15.

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

http://www.sciencedaily.com:80/releases/2008/02/080214130404.htm

Small Streams Can Be Restored Inexpensively With Dead Trees, Woody Debris

Streams can be adversely affected even if as little as 10 percent of the watershed is disturbed. Researchers found that by adding dead trees and woody debris to stream channels improved the habitat for stream organisms, including fish. (Credit: Michele Hogan)

ScienceDaily (Feb. 18, 2008) — Small streams disrupted by military training activities or commercial development can be restored with simple and inexpensive measures, according to findings of a group headed by Pat Mulholland of Oak Ridge National Laboratory.

Researchers from ORNL and Auburn University learned that streams can be adversely affected even if as little as 10 percent of the watershed is disturbed.

In their study, conducted at Fort Benning, Ga., the researchers found that revegetating drainage ditches that carry water only during storms and adding dead trees and woody debris to stream channels helped trap smaller organic materials and improve the habitat for stream organisms, including fish.

"This project has provided the military with an improved understanding of its effects on streams and a possible approach for mitigating some of those effects," Mulholland said.

The project was named Sustainable Infrastructure Project of the Year by the Strategic Environmental Research and Development Program, which funded the work.

Adapted from materials provided by DOE/Oak Ridge National Laboratory.

http://www.sciencedaily.com:80/releases/2008/02/080213144617.htm

Why Does The World Appear Stable While Our Eyes Move?

ScienceDaily (Feb. 18, 2008) — Whenever we shift our gaze, attention is directed to a new target. This shift in attention causes a brief compression of visual space, according to a new study. The team of researchers from the University of Münster, Germany, describes a model of brain function in which eye movement signals are used to boost the neural representation of objects located at the future eye position. This boost comes at the expense of a temporary loss of spatial accuracy. This research shows a direct correlation between visual perception and eye movement control.

Humans move their eyes 2-3 times a second without noticing. Each gaze shift triggers a host of internal brain processes with very delicate timing. The gaze shift is preceded by a brief shift of attention towards the new gaze target so that visual processing at the target area improves some 50 milliseconds before the eye itself looks at the target. This preceding improvement increases the sensitivity of visual neurons in many brain areas, which then respond more strongly to stimuli near the gaze target just prior to the gaze movement.

Using a detailed neuro-computational model of the representation of the visual world in cortical maps, the researchers investigated the consequences of these sensitivity changes to the perception of spatial location. Their results showed that objects presented just before the eye movement appear to lie at the gaze target rather than at their true spatial location, akin to a compression of visual space.

Moreover, this model explains a peculiar finding that neurons in some brain areas appear to move their receptive field, i.e. the visual direction to which they respond, prior to eye movement. Analysis of the net effect of all receptive field changes in the model shows that the brain dynamically recruits cells for processing visual information around the target. This increase in processing capacity presumably allows one to perceive details of the object before looking at it, therefore making the world appear stable while we move our eyes.

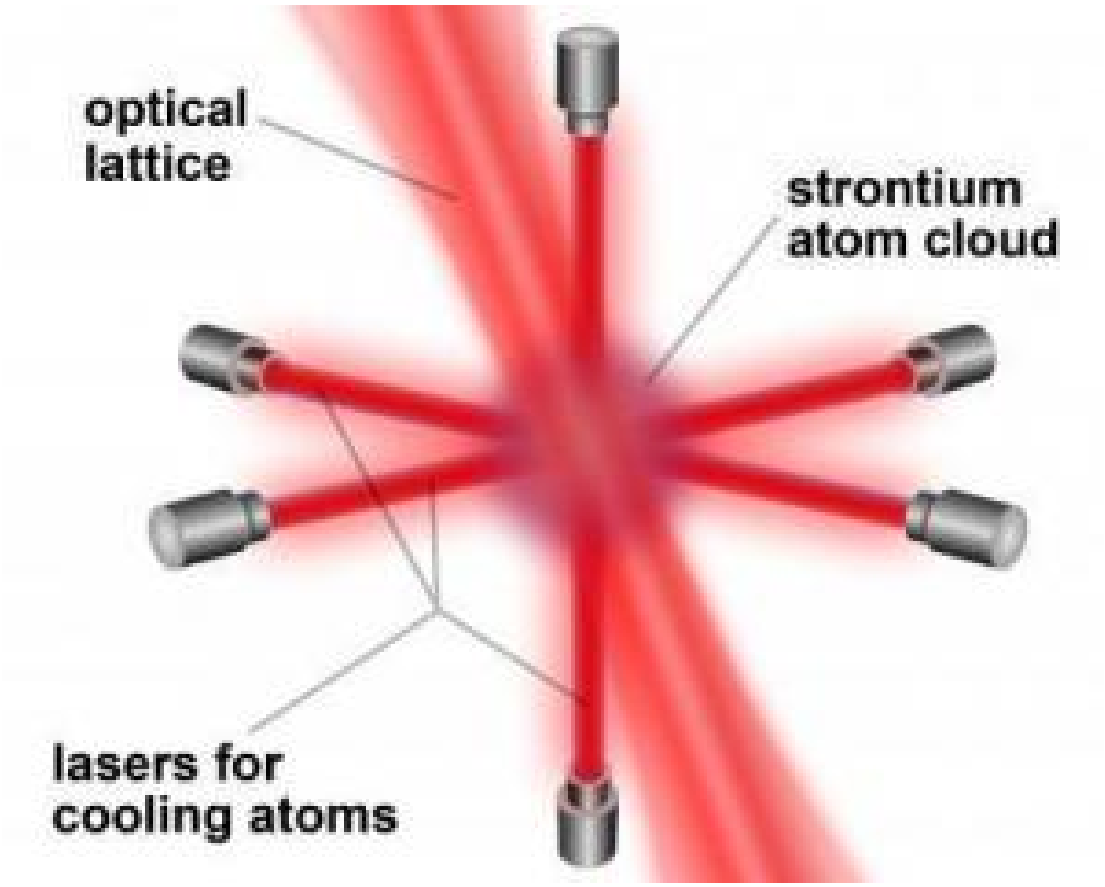
This new model prompts many predictions that can guide experimental research -- one step towards theory driven brain research. The model also paves the way to develop novel concepts for artificial vision systems.

Journal reference: Hamker FH, Zirnsak M, Calow D, Lappe M (2008) The peri-saccadic perception of objects and space. PLoS Comput Biol 4(2): e31. doi:10.1371/journal.pcbi.0040031
http://compbiol.plosjournals.org/perlserv/?request=get-document&doi=10.1371/journal.pcbi.0040031

Adapted from materials provided by Public Library of Science, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80/releases/2008/02/080215103316.htm

Most Accurate Clock Ever: 'Crystal Of Light' Clock Surpasses Accuracy Of NIST-F1 Fountain Clock



JILA's strontium atomic clock is now the world's most accurate clock based on neutral atoms. (Credit: Greg Kuebler/JILA)

ScienceDaily (Feb. 18, 2008) — A next-generation atomic clock that tops previous records for accuracy in clocks based on neutral atoms has been demonstrated by physicists at JILA, a joint institute of the Commerce Department's National Institute of Standards and Technology (NIST) and the University of Colorado at Boulder. The new clock, based on thousands of strontium atoms trapped in grids of laser light, surpasses the accuracy of the current U.S. time standard based on a "fountain" of cesium atoms. JILA's experimental strontium clock, described in Science Express,* is now the world's most accurate atomic clock based on neutral atoms, more than twice as accurate as the NIST-F1 standard cesium clock located just down the road at the NIST campus in Boulder.

The JILA strontium clock would neither gain nor lose a second in more than 200 million years, compared to NIST F-1's current accuracy of over 80 million years.

The advance was made possible by Boulder's critical mass of state-of-the-art timekeeping equipment and expertise. The JILA strontium clock was evaluated by remotely comparing it to a third NIST atomic clock, an experimental model based on neutral calcium atoms. The best clocks can be precisely evaluated by comparing them to other nearby clocks with similar performance; very long-distance signal transfer, such as by satellite, is too unstable for practical, reliable comparisons of the new generation of clocks. In the latest experiment, signals from the two clocks were compared via a 3.5-kilometer underground fiber-optic cable.

The strontium and calcium clocks rely on the use of optical light, which has higher frequencies than the microwaves used in NIST-F1. Because the frequencies are higher, the clocks divide time into smaller

units, offering record precision. Laboratories around the world are developing optical clocks based on a variety of different designs and atoms; it is not yet clear which design will emerge as the best and be chosen as the next international standard. The work reported in Science Express is the first optical atomic clock comparison over kilometer-scale urban distances, an important step for worldwide development of future standards. "This is our first comparison to another optical atomic clock," says NIST/JILA Fellow Jun Ye, who leads the strontium project. "As of now, Boulder is in a very unique position. We have all the ingredients, including multiple optical clocks and the fiber-optic link, working so well. Without a single one of these components, these measurements would not be possible. It's all coming together at this moment in time."

NIST and JILA are home to optical clocks based on a variety of atoms, including strontium, calcium, mercury, aluminum, and ytterbium, each offering different advantages. Ye now plans to compare strontium to the world's most accurate clock, NIST's experimental design based on a single mercury ion (charged atom). The mercury ion clock was accurate to about 1 second in 400 million years in 2006 and performs even better today, according to Jim Bergquist, the NIST physicist who built the clock. The "best" status in atomic clocks is a moving target. The development and testing of a new generation of optical atomic clocks is important because highly precise clocks are used to synchronize telecom networks and deep-space communications, as well as for navigation and positioning. The race to build even better clocks is expected to lead to new types of gravity sensors, as well as new tests of fundamental physical laws to increase understanding of the universe.

Because Ye's group is able to measure and control interactions among so many atoms with such exquisite precision, the JILA work also is expected to lead to new scientific tools for quantum simulations that will help scientists better understand how matter and light behave under the strange rules governing the nanoworld. In the JILA clock, a few thousand atoms of the alkaline-earth metal strontium are held in a column of about 100 pancake-shaped traps called an "optical lattice." The lattice is formed by standing waves of intense near-infrared laser light. Forming a sort of artificial crystal of light, the lattice constrains atom motion and reduces systematic errors that occur in clocks that use moving balls of atoms, such as NIST-F1. Using thousands of atoms at once also produces stronger signals and eventually may yield more precise results than clocks relying on a single ion, such as mercury.

JILA scientists detect strontium's "ticks" (430 trillion per second) by bathing the atoms in very stable red laser light at the exact frequency that prompts jumps between two electronic energy levels. The JILA team recently improved the clock by achieving much better control of the atoms. For example, they can now cancel out the atoms' internal sensitivity to external magnetic fields, which otherwise degrade clock accuracy. They also characterized more precisely the effects of confining atoms in the lattice. The NIST calcium clock, which was used to evaluate the performance of the new strontium clock, relies on the ticking of clouds of millions of calcium atoms. This clock offers high stability for short times, relatively compact size and simplicity of operation. NIST scientists believe it could be made portable and perhaps transported to other institutions for evaluations of other optical atomic clocks. JILA scientists were able to take advantage of the calcium clock's good short-term stability by making fast measurements of one property in the strontium clock and then quickly switching to a different property to start the comparison over again.

The JILA-NIST collaborations benefit both institutions by enabling scientists not only to compare and measure clock performance, but also to share tools and expertise. Another key element to the latest comparison was the use of two custom-made frequency combs, the most accurate tool for measuring optical frequencies, which helped to maintain stability during signal transfer between the two institutions.

* Journal reference: A.D. Ludlow, T. Zelevinsky, G.K. Campbell, S. Blatt, M.M. Boyd, M.H.G. de Miranda, M.J. Martin, S.M. Foreman, J. Ye, T.M. Fortier, J.E. Stalnaker, S.A. Diddams, Y. Le Coq, Z.W. Barber, N. Poli, N.D. Lemke, K.M. Beck, & C. Oates. 2008. Sr lattice clock at 1x10-16 fractional uncertainty by remote optical evaluation with a Ca clock. Science Express. Posted online Feb. 14.

Adapted from materials provided by National Institute of Standards and Technology.

http://www.sciencedaily.com:80/releases/2008/02/080214144459.htm

New Device Could Put The Beat Back Into Weak Hearts, And Free Patients From Antirejection Drugs

PhD student David Keeling with the web material that will be used in the development of the heart assist device. (Credit: Simon & Simon Photography)

ScienceDaily (Feb. 18, 2008) — A new device could put the beat back into weak hearts - and free patients from a lifetime of anti-rejection drugs. Current implanted heart assist devices function by sucking blood from the ventricles and then expelling it into downstream vessels. Whilst these have been successful in prolonging the lives of heart patients, they come into contact with the blood stream and hence require life-long drug therapy to suppress the immune system and prevent blood clotting. In addition, many of these devices use high speed turbines to produce the pumping force, and this has been proven to cause damage to cells within the blood increasing the chance of clots forming.

The ingenious device being developed by engineers at the University of Leeds provides a less invasive alternative. The team has developed a specially-woven web made from biocompatible material which will not be rejected by the body.

The webbing wraps around the heart and therefore does not come into contact with the blood stream. Inbuilt sensors recognise when the heart wants to beat and trigger a series of miniature motors which cause the web to contract -- increasing the internal pressure and assisting the heart to pump the blood around the body.

The team consists of Drs Peter Walker (who devised the original concept) and Martin Levesley from the University's School of Mechanical Engineering, cardiac consultants Kevin Watterson and Osama Jaber from Leeds General Infirmary and engineering PhD student David Keeling.

"It's a really simple concept that works in the same way as when you squeeze a plastic bottle, forcing the liquid inside to rise," says PhD student David Keeling who has built a special rig to test the device.

The device is currently at prototype stage with team using a computer simulated model of the human blood flow circuit coupled to David's mechanical rig. The rig replicates the motion of the heart within the simulation under different conditions, and allows the team to test their web device. The group is currently testing their latest prototype, aiming to refine design and assist strategies. Says David: "We've been looking at finding the optimum timing to trigger and also length of the compressive squeeze."

Once the mechanics have been perfected, the team intends to simulate the effects of different heart diseases to gauge the potential success of the device.

Potential uses for the device are huge. As well as offering support to people suffering from heart and valve problems, the device could also be a bridging aid to patients as they wait for transplants, providing them with a better quality of life.

Says David: "Recent research has found that with some heart diseases, supporting the heart for a short period with an assistive device reduces the work-load on the heart and allows it to rest and recover. Our device also allows for a controlled relaxation of the heart muscle after contraction, which means that it's being supported throughout the whole heartbeat process. It's the same as when you pull a muscle in any other part of your body, rest can often be the best therapy."

The research has been funded by Leeds-based medical charity Heart Research UK.

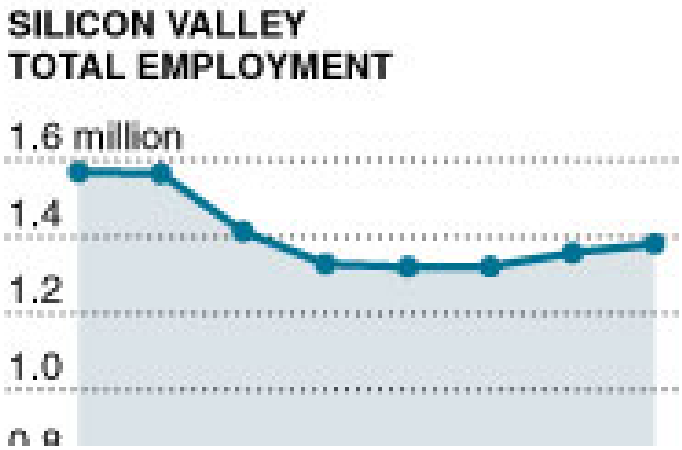
Adapted from materials provided by University of Leeds.

http://www.sciencedaily.com:80/releases/2008/02/080214093128.htm

Silicon Valley Losing Middle-Wage Jobs

By JOHN MARKOFF

SAN FRANCISCO — Silicon Valley is in danger of creating its own digital divide.



The California region is losing its middle-class work force at a significant rate, according to an annual report that tracks the economic, social and environmental health of the region that is the nation's technology heartland.

The 2008 Index of Silicon Valley — which this year was sponsored by Joint Venture: Silicon Valley Network, a public-private partnership, and the Silicon Valley Community Foundation, a nonprofit — found that from 2002 to 2006, middle-wage jobs fell to 46 percent of the work force, from 52 percent.

At the same time, while the percentage of higher-end jobs rose slightly — to 27 percent from 26 — lower-wage jobs expanded to 27 percent, from 22 percent of the work force. In all, more than 50,000 middle-income jobs have disappeared over the four years measured by the study.

The vanishing jobs — defined as those paying $30,000 to $80,000 — represent workers who had been in the lower part of the white-collar pyramid, including secretaries, clerks and customer support representatives. The picture was blurred, however, by growth in some blue-collar, middle-income professions like electricians and plumbers, and several white-collar areas like computer support technicians.

The consequence of the shift may undercut some of the basic mechanisms of the Valley economy, according to the authors of the report, by making upward mobility more difficult.

"If you lose the middle, it's harder to support the top," said Doug Henton, an economist at Collaborative Economics, a research and consulting firm in Mountain View, Calif., that helps prepare the annual report.

The short-range outlook for the region appears to be more positive, with the overall pace of job gains outpacing the nation's.

For example, for the first time since 2001, when the dot-com sector was imploding, median household income rose. Silicon Valley added 28,000 jobs, for an increase of 1.7 percent in 2007. Over all, the region is far more wealthy than the rest of the country, with per capita income 57 percent higher than the national average.

Despite fears of losses in the wake of the Sept. 11 attacks, the region continues to see a healthy in-flow of talent from outside the United States. More than 17,000 foreign citizens moved to the region last year, reversing a decline since the number peaked in 2001 at above 30,000.

Forty-eight percent of the households of the region speak a language other than English in the home.

Reflecting the changing boundaries of what is defined as Silicon Valley, this year the authors of the report added all of San Mateo County's work force. It was the first change to the definition of the region by the study, which was first published in 1995. By moving the northern border of the Valley past the San Francisco airport, the area now reflects more of the biotechnology orientation of companies like Genentech. The region does not include San Francisco.

Venture capital investment continued to climb at a healthy clip during 2007, rising by 11 percent. Sixty-two percent of the so-called clean tech venture investment for California was invested in Silicon Valley during the year.

The Valley continues to stand apart because it is a center of technical innovation, said Russell Hancock, president of Joint Venture. But he also said it was unlikely that the region would be unaffected by a recession or the subprime mortgage crisis.

Still, the researchers behind the study said the Valley was distinguished by the flexibility of its economy and its ability to adapt to changing conditions.

"What we're talking about is a Valley that continues to reinvent itself, and it's not in any one sector," Mr. Henton said.

One notable category in which the region lags behind its international competitors is home broadband networks. Only 51 percent of the region has access to broadband Internet — defined as more than 200 kilobits per second. In contrast, 65 percent of the households in Japan and 94 percent in South Korea are wired to at least that speed.

http://www.nytimes.com/2008/02/19/technology/19valley.html?th&emc=th

Learning From Tijuana: Hudson, N.Y., Considers Different Housing Model

By NICOLAI OUROUSSOFF

If you doubt that the derelict shantytowns of Tijuana could work as a template for redevelopment in a quaint, upscale town in the Hudson River Valley, you're probably underestimating Teddy Cruz.

Mr. Cruz, an architect and professor at the University of California, San Diego, has spent the better part of a decade strolling through Mexico's bustling border towns in search of inspiration. Where others saw poverty and decay, he saw the seeds of a vibrant social and architectural model, one that could be harnessed to invigorate numbingly uniform suburban communities just across the border.

"Developers in Tijuana would build entire neighborhoods of generic 400-square-foot houses — miniature versions of suburban America," Mr. Cruz said in an interview. "What I noticed is how quickly these developments were retrofitted by the tenants." Informal businesses like mechanics' shops and taco stands would quickly sprout up on the front lawns and between the houses, transforming them into highly layered spaces.

Mr. Cruz built a reputation by applying those lessons to the design of residential developments for Latino immigrants in suburban San Diego, enveloping simple housing units in a matrix of communal spaces.

About a year and a half ago, Mr. Cruz received an unexpected call from David Deutsch, an artist who runs a nonprofit foundation that sponsors arts programs in Hudson, N.Y. Mr. Deutsch was worried about the effects of gentrification on the town's poorest residents, many of whom live in decaying neighborhoods just out of view of the transplanted New Yorkers and weekend antique shoppers ambling down its main strip.

Together Mr. Cruz and Mr. Deutsch set in motion an unconventional redevelopment plan aimed at reintegrating the poor and the dispossessed into Hudson's everyday life. (The plan, which is being supported by the city's mayor, Richard Scalera, is scheduled to go before the city council in the next few weeks.)

They began by holding a series of workshops with Bangladeshi and Hispanic immigrants and African-American and elderly residents to develop a project that grew to include communal gardens, playgrounds, an outdoor amphitheater, a co-op grocery and "incubator spaces" that could be used for arts or job-training programs.

To insert the project as gently as possible into the city's existing fabric, Mr. Cruz broke it into six distinct developments. Then he zeroed in on a series of empty municipal lots — "leftover urban fragments," he

calls them — that serve as an informal dividing line between the decrepit working-class neighborhood along State Street and the pricey coffee and antiques shops that run parallel along Warren Street, just to the west.

His notion was to use the developments to create a series of subtle but unexpected connections between east and west, poor and privileged. In one example Mr. Cruz proposed a narrow park that would cut through a series of city blocks and connect Warren and State Streets. Along the park's eastern edge, he would plant a mixed-use housing complex with apartments stacked like building blocks around a series of intimate public zones.

At the center of the complex he designed a raised amphitheater where tenants could sit and look out at the park below. Smaller, more private terraces overlook the amphitheater from the surrounding apartments. Each of the units has its own private entrance on the street.

Mr. Cruz also proposed to preserve a community garden several blocks to the north by surrounding it on three sides with housing and public amenities. A long covered loggia frames one side of the garden, with a greenhouse perched on top. The loggia will act as a communal porch where people can mingle, eat lunch, play chess. A row of small three-story houses frames the opposite side, punctuated by narrow alleyways that will allow people to filter into the site.

There are also more direct echoes of Mr. Cruz's Tijuana research. In one development a day care and elderly center topped by stacked apartments would be housed in a series of garagelike spaces along a small public playground. The apartments are reminiscent of the stucco bungalows in Tijuana that are sometimes raised on steel braces to make room for new shops underneath.

Some of the apartments extend over the park like fingers, suggesting makeshift shelters. Small, shared terraces connect the affordable units to instill a sense of community. Higher up a series of market-rate apartments have private terraces, as if to assert their independence.

For iconoclasts Mr. Cruz's design may not push enough buttons in formal architectural terms. But his great achievement here has less to do with aesthetic experimentation than with creating a bold antidote to the depressing model of ersatz small-town America embraced by so many suburban developers in recent years. In its place he proposes a complex interweaving of rich and poor, old and new, public and private, a fabric in which each strand proclaims a distinct identity.

As the flow of new immigrants into America's suburbs makes them ripe for architectural experimentation, his insights will become only more relevant.

http://www.nytimes.com/2008/02/19/arts/design/19hous.html?_r=1&th&emc=th&oref=login

Strangers in a Very Dark New York Night

By CHARLES ISHERWOOD

The lives of lonely New Yorkers come together and fall apart in "Unconditional," a bluesy, moody, ultimately draggy new drama by Brett C. Leonard that opened Monday night at the Public Theater.

The play strikes a dark note from the start. The audience is divided into two sections, facing each other across a yawning playing space in the Shiva Theater. Panels in the middle of the stage suddenly slide away to reveal a white man standing on a chair, trussed up in duct tape, a noose around his neck.

A blues song plays — loud and long — as a black man smokes a cigarette, apparently ruminating on his work. He pulls out a gun. He sets fire to a Confederate flag. He makes a move.

The song cuts off, the gruesome image is swept away, and we are cast into a dark night in the lonesome city to trace the roots of this and other urban traumas. Two strangers, again one white and one black, sit at opposite ends of a bar. Keith (John Doman), white, balding and middle age, is passing the time and hoping for a late-night hookup. He tells a long story about a bad night in New Jersey. Lotty (Saidah Arrika Ekulona), a black woman a bit younger, stares before her, silent and smoking, looking bored.

Across town, another interracial couple, the black Spike (Chris Chalk) and the white Missy (Anna Chlumsky), engage in rough birthday sex, taking turns slapping each other. Cut to Tracie (Yolonda Ross) and Jessica (Elizabeth Rodriguez), over coffee and salad in a diner. Jessica is giving Tracie a sharp talking to: "He raises another finger to you, you hit him with a small appliance to the side of his skull," she advises.

Sex, violence, heartache. As it weaves together nine lives and several distinct story lines, Mr. Leonard's ambitious play circles continually around these themes, with the troublesome issue of race relations a common thread to all. Two marriages will falter, and two lives will come to harsh ends.

But the play's images of loneliness, brutality and loss do not resonate as they are meant to. Mr. Leonard's many characters are glimpsed too fleetingly to get much purchase on our minds and hearts.

Directed by Mark Wing-Davey for the LAByrinth Theater Company, "Unconditional" moves fluidly from scene to scene, on a scrappy-looking set by Mark Wendland that emphasizes its atmosphere of isolation and separation. Mr. Leonard writes with precision for an impressive variety of characters; the dialogue, as is the house style at the LAByrinth, is scabrous, grittily naturalistic, sometimes potently pause filled, sometimes pungent with brute feeling.

But the complicated, quasi-cinematic structure — the play is composed of a long string of brief scenes and images — keeps the various minidramas from being satisfyingly explored. More problematically, some strands feel manipulated to reach unconvincing dramatic climaxes. (This is the case with both murders.)

"Unconditional" does offer some rich material to its actors. (It's the kind of play in which one character will remain silent for preternaturally long stretches so that another can deliver a monologue.)

Ms. Rodriguez, in a relatively minor role, brings a zesty comic flair to her performance as the trashy-mouthed Jessica. Ms. Ekulona and Mr. Doman, as the least likely of the interracial couples, strike real sparks. Isiah Whitlock Jr., playing a man laid off from his job after 25 years of service, portrays his character's journey from withdrawn grief and shame to seething rage with a quiet intensity that feels real.

And yet while individual performances and scenes are effective, the whole adds up to less than the sum of its parts. Nagging dissatisfactions linger after darkness falls for good on Mr. Leonard's strangers in the night.

Why do virtually all the relationships between the black and white characters in the play involve sex or violence (or both), for example? The pattern feels overdetermined, even a little distasteful.

And are beautiful black women really so eager to hop into bed with shlubby white guys? I didn't buy it in the film "Monster's Ball," when it was Halle Berry and Billy Bob Thornton, and I don't here.

UNCONDITIONAL

By Brett C. Leonard; directed by Mark Wing-Davey; sets by Mark Wendland; costumes by Mimi O'Donnell; lighting by Japhy Weideman; sound by Bart Fasbender; production stage manager, Libbey Steiner; assistant stage manager, Libby Unsworth. Presented by the LAByrinth Theater Company, John Ortiz, artistic director; Philip Seymour Hoffman, co-artistic director; John Gould Rubin, co-artistic director and executive director. At the Public Theater, 425 Lafayette Street, East Village; (212) 260-2400. Through March 9. Running time: 2 hours 15 minutes.

WITH: Chris Chalk (Spike), Anna Chlumsky (Missy), John Doman (Keith), Saidah Arrika Ekulona (Lotty), Kevin Geer (Gary), Trevor Long (Daniel), Elizabeth Rodriguez (Jessica), Yolonda Ross (Tracie) and Isiah Whitlock, Jr. (Newton).

http://theater2.nytimes.com/2008/02/19/theater/reviews/19unco.html?th&emc=th

One Man's Jury Duty Is Another Man's Inspiration to Make Choreography

By JENNIFER DUNNING

Dancers and choreographers tend to walk through the world wondering what each empty space they see would look like filled with dance. Arthur Mitchell, the artistic director of the Dance Theater of Harlem, is not immune. Called to jury duty three years ago at State Supreme Court in Manhattan, Mr. Mitchell gazed at the elegant rotunda of the courthouse at 60 Centre Street and saw his dancers performing there.

"It was fabulous," he said. "I thought of the Sistine Chapel." After all, he had chosen the Guggenheim Museum for the formal debut of his troupe in 1971. He found his way to the county clerk's office. Had anyone ever danced in the rotunda? he asked Pearl Hampton, deputy county clerk. What about a lecture-demonstration there? Soon after, a date was set. A wooden stage was erected for a free lunchtime concert. And an annual tradition was born.

Young members of the company's Dancing Through Barriers Ensemble and students from its school will perform in the rotunda on Thursday at 12:45 p.m. in "An Informal Presentation on the Art of Dance." The free hourlong program consists of excerpts from the repertory of the senior company, which remains on hiatus. (Financial difficulties forced it to suspend activity in 2004.) Mr. Mitchell serves as the program's host. Open to the public, it is expected to draw the usual crowd of jurors, passersby and court employees.

One of the most enthusiastic members of the audience will probably be Justice Jacqueline W. Silbermann, administrative judge of the civil branch of State Supreme Court in Manhattan. Justice Silbermann, who has subscribed to the New York City Ballet for many years, is a member of the court's anti-bias committee, a sponsor of the Dance Theater event, which works with New Yorkers to familiarize them with the courts and the judicial system.

"This brings the whole court together," Justice Silbermann said. "The whole atmosphere is much warmer, much friendlier." She happily poses for photographs with Mr. Mitchell and the dancers at his request.

"The most charming gentleman you'd ever want to meet," she said. "A few of the children have asked questions, and we are always available to them." She is asked most often how she became a judge and whether she has ever sentenced anyone to death. "They don't understand that this is civil court," she said. To the children, a judge is a judge.

Ms. Hampton, also a member of the anti-bias committee, said she understood why Mr. Mitchell was mesmerized by the rotunda, and when he approached her, she was ready for him. Not only would such a program fit well with the committee's goals, but it would also be a fine addition to Black History Month. And, she said, she once wished to be a dancer herself, but it was "not in the cards."

P. J. Garone, Appellate Court clerk and co-chairwoman with Ms. Hampton of the court's Dance Theater of Harlem Program Committee, also had some familiarity with dance. "I go to see Alvin Ailey religiously," she said.

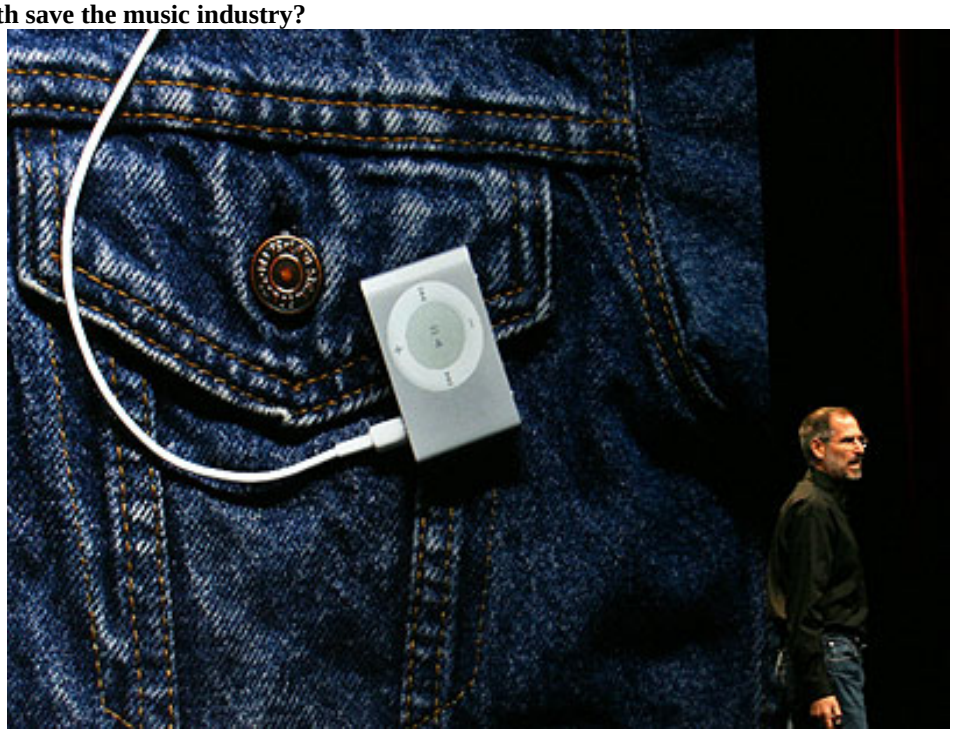
Mr. Mitchell recalled being approached by a court guard after a rotunda program. "You don't remember me?" she asked him. She had studied at the company's school, she said. Not all children who train in ballet will end up performing ballet professionally, Mr. Mitchell has often said. But programs like "An Informal Presentation" familiarize their audiences with the art of ballet, he said, and also teach young performers about the world around them and their place in it.

Preparation for Dancing Through Barriers programs involves not only rehearsal but also talk about the site — whether corporate headquarters or courthouse — of the performance. "Dance Theater is bringing the arts to the judicial system," Mr. Mitchell said. "And it is developing great dancers and human beings who know how the judicial system works."

"An Informal Presentation on the Art of Dance" is to be performed on Thursday at State Supreme Court, 60 Centre Street, Lower Manhattan; (212) 690-2800.

http://www.nytimes.com/2008/02/20/arts/dance/20harl.html?ex=1361163600&en=a5b869ec908817ef&ei=5088&partner=rssnyt&emc=rss

Could $5 a month save the music industry?



REUTERS FILE PHOTO

iPod Shuffle
February 20, 2008
GREG QUILL

The Songwriters Association of Canada proposes a $5 monthly fee on subscribers' Internet bills that would make it legal to download music and hopefully save the failing music industry.

THE PROBLEM

Sales of CDs are down 20 per cent worldwide and 35 per cent in Canada, compared to 2006.

An estimated 1.6 billion music files are downloaded in Canada each year on "grey-market" peer-to-peer systems, representing $1.6 billion in lost revenue, using the iTunes price model of 99 cents per download.

The total number of purchased downloads in Canada was 38 million in 2005. The ratio of shared to paid downloads is 98:2 (98% shared files vs. 2% purchased downloads).

Virtually every song ever recorded is available through peer-to-peer file-sharing (more than 79 million recordings). Only 3 million songs are available on legal sites.

Sources: Songwriters Association of Canada; Canadian Record Industry Association; PricewaterhouseCoopers LLB

WHAT'S THE PLAN?

SAC is calling for the creation of the Right to Equitable Remuneration for Music File Sharing, which would make it legal to share music on peer-to-peer networks in exchange for the monthly fee. The fee – amounting to an estimated $500 million to $900 million annually in Canada – would be administered by a collective of artists, songwriters, music publishers and record labels. "Monetizing peer-to-peer file-

sharing would generate significant new revenue for creators and the music industry," says acting SAC president Eddie Schwartz, "and re-establish revenue levels (for songwriters) that we haven't seen since 2000-2001."

THE FORUM

SAC, which represents the interests of Canadian music composers and lyricists, is advancing its radical proposal at a public forum tomorrow at 7 p.m. at Oakham House at Ryerson University. It hopes this will be the first step towards legitimizing peer-to-peer music file-sharing activity in this country – and perhaps eventually all over the world – while compensating music creators at the same time.

For more information go to songwriters.ca, or call 1-866-456-7664.

WHAT'S IN IT FOR CONSUMERS?

SAC argues the fee would remove the stigma of illegality from file-sharing and represents exceptional value to the consumer, since it would allow unlimited access to the majority of the world's repertoire of recorded music.

The plan renders digital rights management and the legal protection for digital locks, which prevent copying and file-sharing, "obsolete," Schwartz says. "The simple truth is that there's no way anyone can stop free file-sharing. It's exciting to discover new music and natural to want to share it. File-sharing isn't about the marketplace, it's social activity, a way to seek out like-minded people, and music has always been used that way. The SAC proposal may not be the silver bullet that saves the music industry, but it could be the greatest opportunity independent artists and music consumers have. There are no middlemen, no gatekeepers, no owners of the means of music distribution in this proposal. Consumers can interact directly with the creators of music."

WHAT ARE THE OBSTACLES?

Internet Service Providers may resist adding $5 to customers' monthly bills.

The four major record labels, which have traditionally dominated music distribution, oppose all attempts to establish alternatives or competitors.

The federal government, which will have to be convinced of the merit of the changes in the Copyright Act, is reluctant to intervene in the marketplace unless in the public interest.

Songwriters and authors will have to give up their long-established right to approve or disapprove of the use and means of dissemination of their work. The only right they will have is the right to be paid for peer-to-peer downloads.

Internet users who do not download music – paid or otherwise – will balk at paying an extra $5 a month.

Source: David Fewer, staff counsel with the Canadian Internet Policy and Public Interest Clinic at the University of Ottawa, Faculty of Law

CHORUS OF SUPPORT

"I wholeheartedly believe that this model for file-sharing should be embraced in all countries. Let's get it rolling and it can be a template for other performing rights societies throughout the world. With dwindling record sales because of the thievery, this might be the new paradigm of income source for all songwriters."

–musician Randy Bachman

"The Canadian Music Creators Coalition endorses the Songwriters Association of Canada in pushing this proposal forward. We think the Canadian government should be facilitating discussion over the merits of this forward-thinking approach. This is the first progressive proposal we've seen in Canada to address file-sharing ... a made-in-Canada approach to (the issue)." –**Andrew Cash, spokesperson for the organization that monitors legal and policy issues affecting Canadian musicians**

"With the Internet I have virtually unlimited access to millions of music files. Amazing, right? Well ... yes and no. I'm a songwriter. Songwriters create ideas. We're inventors. Think about the light bulb and the telephone. People don't mind paying for their telephone and electricity each month, but somehow they think music should be free. The truth is, music has value too. We believe access to online music should remain unlimited. We're just asking that the value of our music be acknowledged and that we be fairly compensated."

–Bryan Adams collaborator Jim Vallance

"I think if there was an ISP tax of some sort, we can say, `All music is now available and able to be downloaded and put in your car and put in your iPod and put it up your ass if you want, and it's $5 on your cable bill.'"

–Trent Reznor, Nine Inch Nails

http://www.thestar.com/entertainment/article/305082

Open Minds, Open Books, Open Source

As card catalogs once gave way to computers, it might be time for another paradigm shift at libraries.

Last month, a survey by Marshall Breeding, director for innovative technologies and research at Vanderbilt University's library, revealed a measure of discord over the options available to librarians for automating their electronic catalogs and databases, software called integrated library systems. Most libraries use solutions from third-party commercial vendors, paying up-front fees and yearly maintenance charges. "Dissatisfaction and concern prevail," Breeding wrote, "yet some companies maintain exceptional levels of satisfaction from the libraries that use their products."

So librarians aren't exactly reaching for their torches and pitchforks. Still, some libraries, fed up with software that doesn't fully meet their needs, have decided to take matters, figuratively, into their own hands. With a bit of grant money and some eager developers, institutions have begun creating their own open-source solutions that are fully customizable, free for others to use and compatible with existing systems. The result has been a whole crop of projects that, when combined, could serve as a fully integrated, end-to-end open-source solution for academic libraries, covering the interface, search mechanism, database system, citations and even course management.

Meanwhile, the increasing availability of open-source software has nudged some libraries to reconsider the role of their in-house technology gurus, and to wonder whether it would make more long-term financial sense to hire more developers than to continue paying for products over which they have limited control.

"If we truly want to remain relevant, it's what we have to do," said Susan Gibbons, an associate dean in the University of Rochester library system.

The code4lib conference, for example, has seen its popularity grow from some 75 attendees in 2006 to a cap of 200 this year, according to Andrew Nagy, who is on the technology management staff at Villanova University's library.

Along with developing their own tools, academic libraries are rethinking which tools they really need.

At Rochester, for example, a $750,000 grant from the Andrew W. Mellon Foundation is helping to fund the eXtensible Catalog (XC) project, a Web 2.0-oriented library catalog interface that is still in development. The software, according to its Web site, will "provide more intuitive access to resources, a customizable interface to include Web 2.0 functionality, and seamless connections to other web

applications, such as learning management systems, that a library may already be using." The partnership extends to other universities, each working on a different piece of what they hope will become a full open-source alternative.

Another project that's currently in beta is VuFind, a project that originated at Villanova with Nagy as the lead developer. "We just weren't happy with our library catalog, the Web component, and we wanted to be able to have our own library catalog that we could customize, change around ... without having to deal with a vendor," he said.

Villanova's library director previously worked as a systems administrator, so Nagy received the green light for his project (without an external grant). It wasn't until six months into the project that his team decided to take it open source, he said — a decision that allowed the university to work with developers at other institutions and test the software on different platforms. At the moment, the university continues to operate the third-party Voyager system while funding the VuFind Web catalog. But eventually, Nagy said, the hope is to move to an all-open-source solution and invest more in in-house developers, a shift that could serve to save costs in the long run.

Open-source Web catalogs like VuFind tend to look a lot like search engines that people who work online are already used to. VuFind (and, eventually, XC) adds Web 2.0 functionality on top of the traditional interface, allowing users to e-mail search results and save results to their favorites. One feature Nagy said was a high priority for library developers is "faceted navigation," which allows users to drill down and refine searches by, for example, author, topic or format. The VuFind interface is also completely compatible with the open-source citation management tool Zotero, a plugin for the Firefox browser.

Another piece of the puzzle is federated search: an engine that sifts through numerous different databases for each user query. One tool being developed at Oregon State University, LibraryFind, combines federated search with a simple, Google-like interface that lets users sort by relevance, save items, refine searches and view electronic documents.

"The more we could simplify the experience, the better people reacted to it," said Jeremy Frumkin, the Gray Family Chair for Innovative Library Services. He said the challenge was often to refine the interface to make it more user-friendly, and to aid as much as possible in the "discovery" portion of the research process.

There's a "growing disconnect in what we're being provided from commercial companies ... and what libraries are starting to realize they need," he said, but libraries aren't blameless either: He believes they need to communicate more effectively the features and functionality they require. And just because it's open source doesn't mean it's better. Soon enough, Gibbons suggested, open source innovations might spur competition and eventually result in more and better choices in the consumer market.

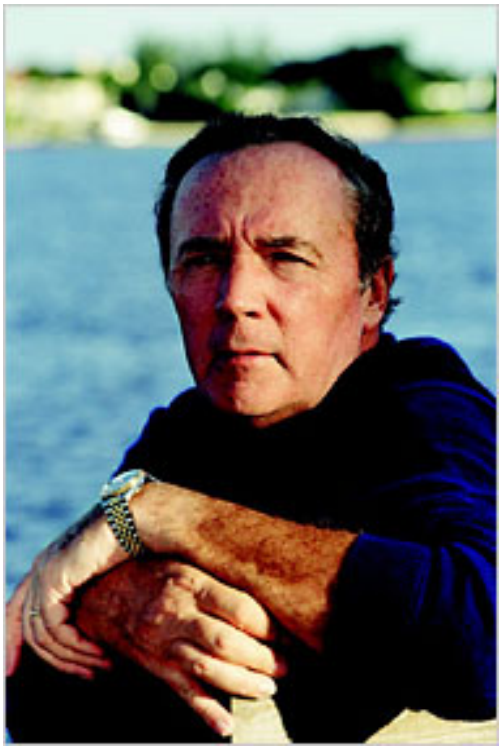
— Andy Guess

http://insidehighered.com:80/news/2008/02/19/opensource

An Author Looks Beyond Age Limits

By MOTOKO RICH

Three years ago James Patterson, the creator of the blockbuster best-selling Alex Cross and "Women's Murder Club" series, began "Maximum Ride," a series for young adults about a group of genetically mutated kids who are part human, part bird. The idea, he said, was to get children to love reading — or at least to love reading his kind of books.



Of the three installments to date, there are about 4.8 million copies in print, according to the publisher, Little, Brown & Company. Despite the kind of numbers that would make most authors beam, Mr. Patterson — who has an estimated 150 million copies of his books in print worldwide, and whose adult novels typically outsell his young-adult titles by two or three to one — wants to sell more. A lot more.

Now, with a new volume, "Maximum Ride: The Final Warning," going on sale next month, Mr. Patterson figures the best way to get young readers may be through their mothers.

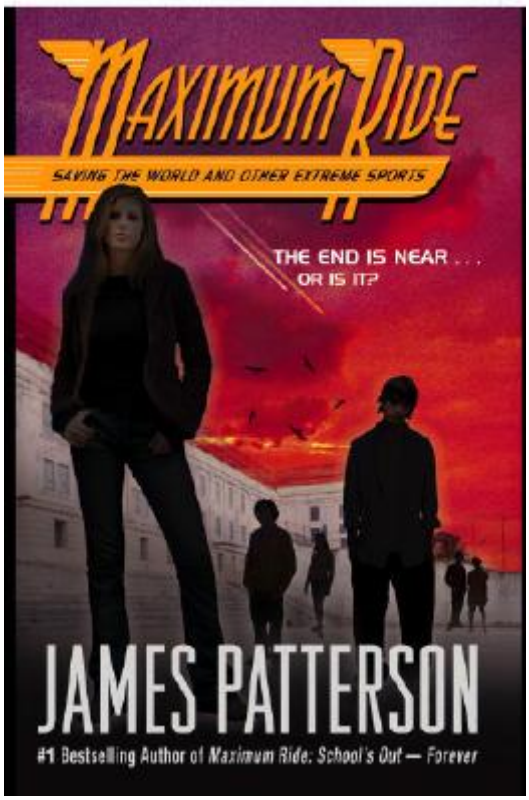
"The reality is that women buy most books," he said in a telephone interview. "The reality is that it's easier, and a really good habit, to start to get parents when they walk into a bookstore to say, 'You know, I should buy a book for my kid as well.' "

As a result, Little, Brown has asked booksellers to commit to keeping the new "Maximum Ride" book — along with "The Dangerous Days of Daniel X," the first title in a new young-adult series, due out in July — at the front of their stores as long as Mr. Patterson's adult titles usually stay there, in the hope of luring more adult buyers.

In the past, Mr. Patterson, who is accustomed to having his books dominate the eagerly sought display tables and shelves at the front of the store, felt that the "Maximum Ride" books (on which he works with a co-writer) were getting buried in the children's section. The most recent book in the series, he complained, "was No. 2 in the country of all books when it came out, and then it had a tremendous drop-off because it just kind of disappeared." (According to Nielsen Bookscan, which tracks about 70 percent

of retail sales, “Maximum Ride: Saving the World and Other Extreme Sports” sold 192,000 copies in hardcover, hardly a poor showing.)

In addition to wanting more young people to read the books, Mr. Patterson and Little, Brown maintain that more grown-ups would buy and read them, if only they could find them. According to market research conducted by Codex Group on behalf of Little, Brown, more than 60 percent of the readers of the “Maximum Ride” series are older than 35.



Publishers and booksellers have increasingly documented the popularity of young-adult titles among grown-ups. The Harry Potter books had as big a fan base among adults as they did among youngsters. Other titles by authors like Stephenie Meyer, who writes vampire romances, also for Little, Brown, and Philip Pullman, who wrote the “Dark Materials” fantasy trilogy, are snapped up by adults as well as young readers.

Hoping to capitalize on that trend as well as on Mr. Patterson’s existing reputation among adult readers, Little, Brown has altered the cover design of “The Final Warning” to appeal to a broader audience, emphasizing the book title rather than, as is common for books aimed at younger audiences, the series name.

And whereas the flap copy for the first three books named all the main characters and used exclamation points and short words, the new title’s flap copy employs a slightly more complex vocabulary and emphasizes the global warming theme at the center of the book.

On the back of both “The Final Warning” and “Daniel X” is a new marketing rubric defining each book as a “James Patterson Pageturner,” written “for readers from ten to a hundred and ten.” Reminding readers of the books’ young-adult roots, the pitch promises that “special care has been taken with the language and content.”

“The Final Warning” — which, like the other three titles in the “Maximum Ride” series, has an uncredited co-writer, Gabrielle Charbonnet — still bears the hallmarks of a novel aimed at juvenile audiences, with its irreverent teenage lingo and an action scene that hinges on one character’s flatulence.

In a typical passage, when Max, the 14-year-old narrator, is talking with Fang, her best friend and erstwhile boyfriend, he asks, “What do you want from me?” and Max is flustered. “I hated conversations like this,” she thinks, “hated talking about my feelings unless I was, like, furious. Then words came easily. But this mushy hearts-and-flowers stuff? Ugh.”

David Young, chairman and chief executive of Hachette Book Group USA, which owns Little, Brown, likens the books’ appeal to that of certain movies that cross age lines. “When you take kids out to see ‘Spider-Man,’ you don’t say, ‘I’m going to see a young-adult movie,’ ” Mr. Young said. “You go along and you’re entertained along with the rest of your family.”

Kim Yamaguchi, a stay-at-home mother in Palmdale, Calif., who reviewed “Saving the World and Other Extreme Sports” positively for Mothertalk, a blogging network (mother-talk.com), says she was surprised by how much she enjoyed the book. “He does a really great job of capturing your attention,” Ms.

Yamaguchi said in an interview. “That’s great for kids, because if they don’t get their attention captured they’re not going to read.”

Ms. Yamaguchi said that she passed the book on to her 11-year-old daughter, and that they were both eagerly awaiting “The Final Warning.” Asked who was likely to read it first, she responded, “I will.”

Little, Brown has also asked booksellers to shelve hardcover editions of the new “Maximum Ride” title and “Daniel X” in the adult section. Six months after hardcover publication, it will release a paperback version for the young-adult sections of the bookstores, and six months after that a mass-market paperback edition for the adult shelves.

Booksellers have responded differently to the request. At Borders Group, Diane Mangan, the director for the children’s category, said that although the new “Maximum Ride” would be promoted heavily at the front of the store, it would ultimately remain in the young-adult section.

At Barnes & Noble, Bob Wietrak, a vice president for merchandising, said his chain would allow the “Maximum Ride” books to spend as much time at the front of the stores as one of Mr. Patterson’s adult titles would, and would shelve the hardcovers with the adult books, even though it has rarely done so for other juvenile titles, including the Harry Potter books.

Mr. Wietrak said he was willing to experiment. “If the sales grow and more readers are reading it, wonderful,” he said. “If we haven’t seen significant growth, then we would say, well, maybe only the young teenagers are still buying it and the adults didn’t want it.”

Michael Pietsch, publisher of Little, Brown, said that if the promotion works for James Patterson, it could work for other young-adult authors. “I do like the idea of making books available to as many potential readers as possible,” he said.

Mr. Patterson said that if he simply wanted to make more money, he would have developed another adult series. “I just am convinced that there aren’t enough books like this — books that kids can pick up and go ‘Wow, that was terrific, I wouldn’t mind reading another book,’ ” he said of his “Maximum Ride” series. “The most important thing to me is that more kids read these.”

http://www.nytimes.com/2008/02/20/books/20patt.html?_r=1&ref=arts&oref=slogin

Oldest Oil Paintings Found in Afghanistan

Rosella Lorenzi, Discovery News

Feb. 19, 2008 -- The oldest known oil painting, dating from 650 A.D., has been found in caves in Afghanistan's Bamiyan Valley, according to a team of Japanese, European and U.S. scientists.

The discovery reverses a common perception that the oil painting, considered a typically Western art, originated in Europe, where the earliest examples date to the early 12th century A.D.

Famous for its 1,500-year-old massive Buddha statues, which were destroyed by the Taliban in 2001, the Bamiyan Valley features several caves painted with Buddhist images.

Damaged by the severe natural environment and Taliban dynamite, the cave murals have been restored and studied by the National Research Institute for Cultural Properties in Tokyo, as a UNESCO/Japanese Fund-in-Trust project.

"Since most of the paintings have been lost, looted or deteriorated, we are trying to conserve the intact portions and also try to understand the constituent materials and painting techniques," Yoko Taniguchi, a researcher at the National Research Institute for Cultural Properties in Tokyo, told Discovery News.

"It was during such analysis that we discovered oily and resinous components in a group of wall paintings."

Painted in the mid-7th century A.D., the murals have varying artistic influences and show scenes with knotty-haired Buddhas in vermilion robes sitting cross-legged amid palm leaves and mythical creatures.

Most likely, the paintings are the work of artists who traveled on the Silk Road, the ancient trade route between China, across Central Asia's desert to the West.

The researchers analyzed, with different methods, hundreds of samples. Three different centers -- Tokyo's National Research Institute for Cultural Properties, the European Synchrotron Radiation Facility in France and the Los Angeles-based Getty Conservation Institute -- carried out the tests.

Infrared microscope, micro X-ray diffraction, and micro X-ray fluorescence produced accurate chemical images of the paintings. Gas chromatography confirmed and refined the identification of organic compounds.

"We discovered that a particular group of caves were painted with oil painting technique, using perhaps walnut and poppy seed drying oils. They also have multi-layered structure as if they were like canvas paintings of Medieval period," Taniguchi said.

Synchrotron beam analysis made it possible to identify the compounds used in the different layers of painting.

"These layers are very thin, and it was really important to analyze each of them selectively. Indeed, the paintings are done with a mixture of several ingredients. They are never present as a pure compound," Marine Cotte, a researcher at the European Synchrotron Radiation Facility in Grenoble, France, told Discovery News.

Analysis showed the layers were made up of natural resins, proteins, gums, oil-based paint layers and, in some cases, a resinous, varnish-like layer.

"It is amazing how the ancient people knew the nature of materials well, such as protein, gum, resin, oil, pigments and dyes, and also how to prepare and combine them effectively," Hidemi Otake, a painting conservator at the National Research Institute for Cultural Properties of Japan, told Discovery News.

Murals in many of the Bamiyan caves featured various painting materials and techniques that had been employed through the ages.

"Some caves have rough wall surfaces and matte finishes, and others have very smooth surface, and some have a transparency and shininess. Some paintings have glaze-like layers on top of paint," Otake said.

According to top Afghan archaeologist Zemaryalai Tarzi, president of the Association for the Protection of Afghan Archaeology, the discovery is important as it testifies Afghanistan's rich cultural heritage.

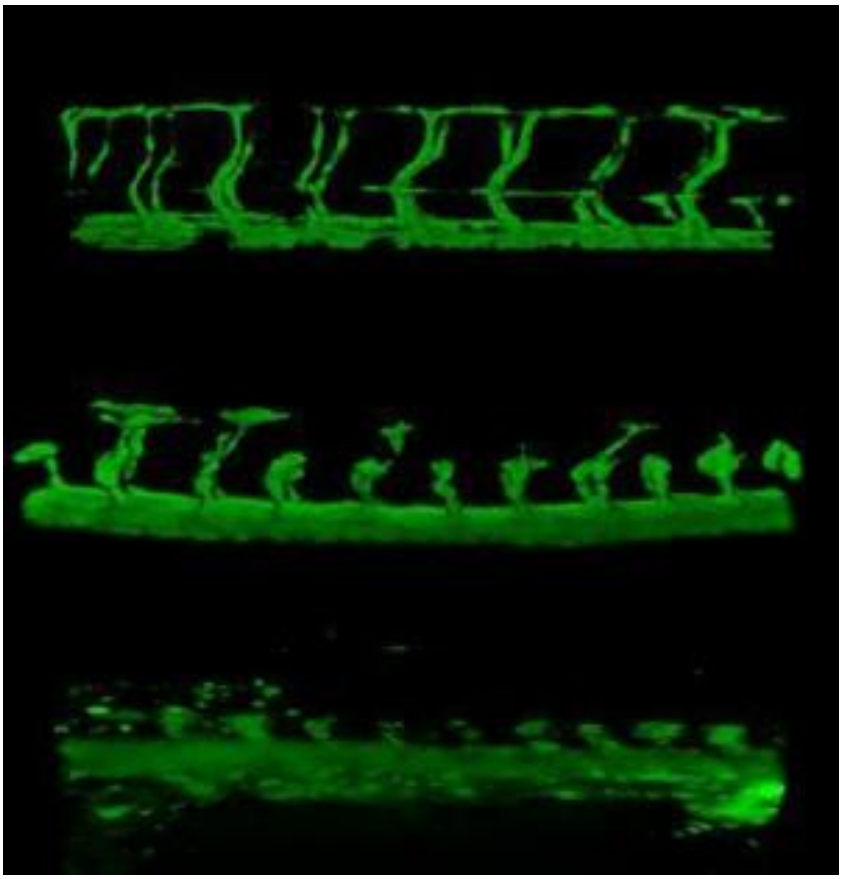
"My Japanese colleagues are conducting scientific research and an inventory of these fragments with courage and perseverance. But the discovery is yet not as important or significant as what the murals of Bamiyan used to be before their disappearance and destruction," Tarzi said.

Tarzi was Afghanistan's director general of archaeology and preservation of historical monuments until 1979, when he was forced to flee the country a few months before the Soviet invasion. He believes further research is necessary to establish the possible role of India and China in developing the technique.

"It would be very important to know if one can attribute this invention to Bamiyan alone," Tarzi said.

http://dsc.discovery.com/news/2008/02/19/oldest-oil-painting.html

Novel Highly Potent Anticancer Drug From The Sea Identified



ScA causes microvessel death in zebrafish. (Credit: K. Stoletov/R. Klemke)

ScienceDaily (Feb. 20, 2008) — A collaborative team of researchers spearheaded by Dennis Carson M.D., professor of medicine and director of the Rebecca and John Moores UCSD Cancer Center at the University of California, San Diego (UCSD) has identified a potent new anti-cancer drug isolated from a toxic blue-green algae found in the South Pacific. The properties of somocystinamide A (ScA) are described in a paper that will be published online in Proceedings of the National Academy of Science the week of February 11 -15.

"We are excited because we have discovered a structurally unique and highly potent cancer-fighting compound," said Dwayne G. Stupack, associate professor of pathology at the Moores UCSD Cancer Center. "We envision it will be perfect for emerging technology, particularly nanotechnology, which is being developed to target cancerous tumors without toxic side effects."

The ScA compound was found in the cyanobacteria L. Majuscula, also known as "mermaid's hair," gathered off the coast of Fiji in the South Pacific by the laboratory of William Gerwick at Scripps Institution of Oceanography. A diverse team of researchers from UCSD's Cancer Center, School of Medicine, Skaggs School of Pharmacy and Pharmaceutical Sciences, and Scripps worked to identify, screen and test marine compounds in vitro and in vivo. They found that ScA inhibits neovascularization, the formation of blood vessels that feed tumors, and also had a direct impact on tumor cell proliferation.

"The compound isn't toxic to the cyanobacteria itself, but activates a 'death pathway', present in our cells," said Stupack. "When the cells of the blood vessels that feed tumors become activated and proliferate, they become especially sensitive to this agent."

Gerwick noted that if a normal-sized swimming pool full of cancer cells were treated with ScA, it would take only three milligrams -- about the weight of a grain of rice -- to kill all of the cancer cells.

Wolf Wrasidlo, Ph.D., senior project scientist at the Moores UCSD Cancer Center and first author of the work, added that the unique structure of this compound lends itself very well to nanotechnology, because it "incorporates spontaneously" into molecule-sized nanoparticles, important for the kind of highly targeted, combination therapy being developed to treat cancer. The structure is also simple enough that the scientists can reproduce it.

"ScA is the first, and most potent compound we've identified so far," Stupack said, adding that it won't be the last, as the Scripps team has identified more than 250 unique compounds from L. Majuscula alone. "But we don't yet know how abundant ScA is, or if it's feasible to harvest, so it is important that we have been able to produce this natural product in the lab."

Contributors to this paper are first authors Wolf Wrasidlo and Ainhoa Mielgo, as well as Vicente A. Torres, Simone Barbero, Konstantin Stoletov, Richard L. Klemke and Dwayne G. Stupack of UCSD's Department of Pathology and Moores UCSD Cancer Center; Takashi L. Suyama of the Skaggs School of Pharmacy and Pharmaceutical Sciences; William H. Gerwick, Scripps Institution of Oceanography and the Skaggs School of Pharmacy and Pharmaceutical Sciences; and Dennis Carson, Director of the Moores UCSD Cancer Center. The research was funded by grants from the National Cancer Institute, as well as fellowships from the National Swiss Foundation and California Breast Cancer Research.

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

http://www.sciencedaily.com:80/releases/2008/02/080211172554.htm

Moving Beyond Tamoxifen: Drug Discovery And The Future Of Selective Hormone Receptor Modulators

How did a failed contraceptive become the first targeted therapy for the treatment of breast cancer? The transformation of tamoxifen, from cast-off to lifesaver, laid the foundation for a new class of therapeutics -- selective estrogen receptor modulators -- that could treat or prevent a variety of human diseases, including cancer and osteoporosis, according to V. Craig Jordan, OBE, Ph.D., D.Sc., a researcher at the Fox Chase Cancer Center in Philadelphia. (Credit: Image courtesy of Fox Chase Cancer Center)

ScienceDaily (Feb. 20, 2008) — How did a failed contraceptive become the first targeted therapy for the treatment of breast cancer? The transformation of tamoxifen, from cast-off to lifesaver, laid the foundation for a new class of therapeutics -- selective estrogen receptor modulators -- that could treat or prevent a variety of human diseases, including cancer and osteoporosis, according to V. Craig Jordan, OBE, Ph.D., D.Sc., a researcher at the Fox Chase Cancer Center in Philadelphia.

Jordan reports on efforts to use the lessons learned about tamoxifen to develop new hormone receptor-related drugs for both women and men at the 2008 Annual Meeting of the American Association for the Advancement of Science in Boston on February 15.

"As both a preventative and therapeutic agent, tamoxifen has been credited with saving the lives of more than a half million women over the last 30 years," says Jordan, the Alfred G. Knudson Jr., M.D., Ph.D., Chair in Cancer Research at Fox Chase. "The process of discovery that made tamoxifen a reality has given us insights into molecular mechanisms that are currently being used to advance the creation and refinement of better drugs."

In the 1970s, Jordan's laboratory pioneered the work that turned tamoxifen into a cancer therapy, which then jump-started a field of study into so-called designer estrogens. These drugs, called selective estrogen receptor modulators (SERMS), can have different effects on their targets, estrogen receptors, depending on where the receptor is located within a woman's body.

The SERM raloxifene, for example, exhibits an anti-estrogen activity that can prevent cancer in breast tissue, but in other tissue the same drug has an estrogen-like effect that increases bone density. Currently,

raloxifene, which was also developed in Jordan's laboratory, is approved in post-menopausal women to prevent osteoporosis and treat breast cancer.

"The idea that SERMs could act like an estrogen in one place and an anti-estrogen in the other has created a new dimension in drug development," Jordan says. "Now we can look at the design of these drugs and see how they can be applied to modulate other receptor sites throughout the body."

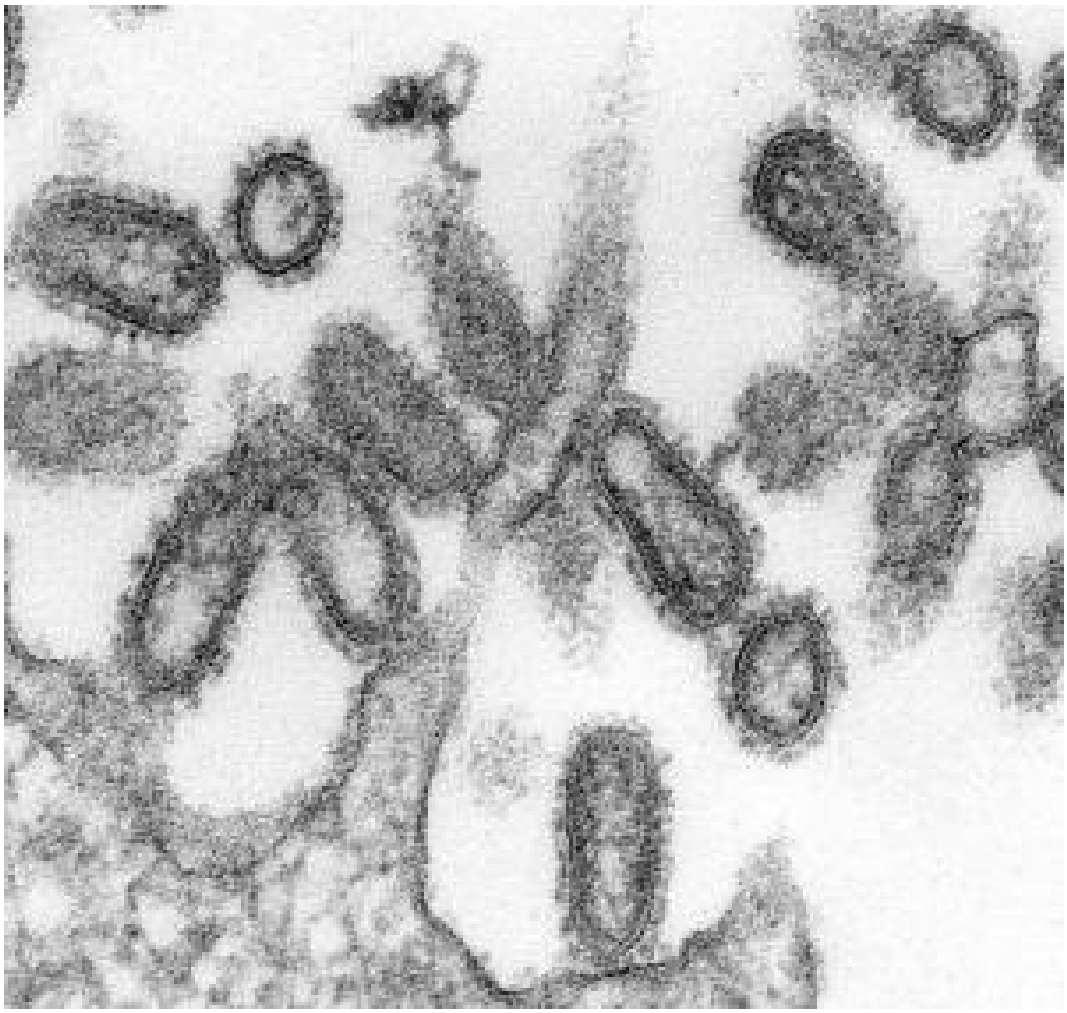
According to Jordan, recent studies have shown light on the complex -- and seemingly contradictory -- mechanisms behind the activity of receptors for steroids, such as estrogen. These mechanisms include slight structural differences in the estrogen receptors themselves in different tissues, as well as co-regulatory molecules that can influence whether a SERM will turn on or shut down a particular receptor. Of the 48 or so members of the nuclear receptor family, which include the molecules inside cells that bind to estrogen and other hormones, nearly half are able to be regulated in some way.

"Our knowledge of how tamoxifen and raloxifene work is now being applied to develop new drugs that are selective male hormone receptor modulators that could be used in men to improve muscle weight during sickness, but without stimulating glands like the prostate," Jordan says. "Indeed, a whole variety of nuclear steroid hormone receptor mediated drugs are now possible because of the understanding of SERM action."

Adapted from materials provided by Fox Chase Cancer Center.

http://www.sciencedaily.com:80/releases/2008/02/080215103239.htm

Spread Of 1918 Flu Pandemic Explained



This transmission electron micrograph of an ultra-thin specimen revealed some of the ultra-structural morphologic features seen in 1918 influenza virus virions. The prominent surface projections on the virions are composed of either the hemagglutinin, or neuraminidase type of glycoproteins. (Credit: Cynthia Goldsmith)

ScienceDaily (Feb. 19, 2008) — MIT researchers have explained why two mutations in the H1N1 avian flu virus were critical for viral transmission in humans during the 1918 pandemic outbreak that killed at least 50 million people.

The team showed that the 1918 influenza strain developed two mutations in a surface molecule called hemagglutinin (HA), which allowed it to bind tightly to receptors in the human upper respiratory tract.

"Two mutations dramatically change the HA binding affinity to receptors found in the human upper airways," said Ram Sasisekharan, the Underwood Prescott Professor of Biological Engineering and Health Sciences and Technology.

Sasisekharan is the senior author of a paper on the work to be published in the Feb. 18 issue of the Proceedings of the National Academy of Sciences. In January, Sasisekharan and colleagues reported in Nature Biotechnology that flu viruses can only bind to human respiratory cells if they match the shape of sugar (or glycan) receptors found on those cells.

The glycan receptors found in the human respiratory tract are known as alpha 2-6 receptors, and they come in two shapes-one resembling an open umbrella, and another resembling a cone. To infect humans the MIT team found that avian flu viruses must gain the ability to bind to the umbrella-shaped alpha 2-6 receptor.

In the current study, the team discovered that two mutations in HA allow flu viruses to bind tightly or with high affinity to the umbrella-shaped glycan receptors.

"The affinity between the influenza virus HA and the glycan receptors appears to be a critical determinant for viral transmission," said Sasisekharan.

The researchers used the 1918 influenza virus as a model system to investigate the biochemical basis for hemagglutinin binding to glycans, which leads to viral transmission. They compared the virus that caused the 1918 pandemic (known as SC18) with a strain called NY18 that differs from SC18 by only one amino acid, and also the AV18 strain, which differs from SC18 by two amino acids.

Using ferrets (which are susceptible to human flu strains), researchers had earlier found that, while SC18 transmitted efficiently between ferrets, NY18 is only slightly infectious and AV18 not at all infectious.

These earlier findings correlate with the viruses' ability to bind umbrella-shaped alpha 2-6 glycan receptors, demonstrated in the current PNAS study.

NY18, which is only slightly infectious, binds to the umbrella-shaped alpha 2-6 receptors but not as well as SC18, which is highly infectious. AV18, which does not infect humans, does not have any affinity for the umbrella-shaped alpha 2-6 receptors and binds only to alpha 2-3 receptors.

Another strain, TX18, binds to alpha 2-6 and alpha 2-3 but is much more infectious than NY18, because it binds with high affinity to the umbrella-shaped alpha 2-6 receptors.

Researchers from the Centers for Disease Control and Prevention reported on the varying infectiousness of these strains last year, but the PNAS study is the first that explains the exact biochemical reason underlying these differences.

This new work could aid researchers in monitoring the HA mutations in the H5N1 avian flu strains currently circulating in Asia. These mutations could enable the virus to jump from birds to humans, as many epidemiologists fear will occur.

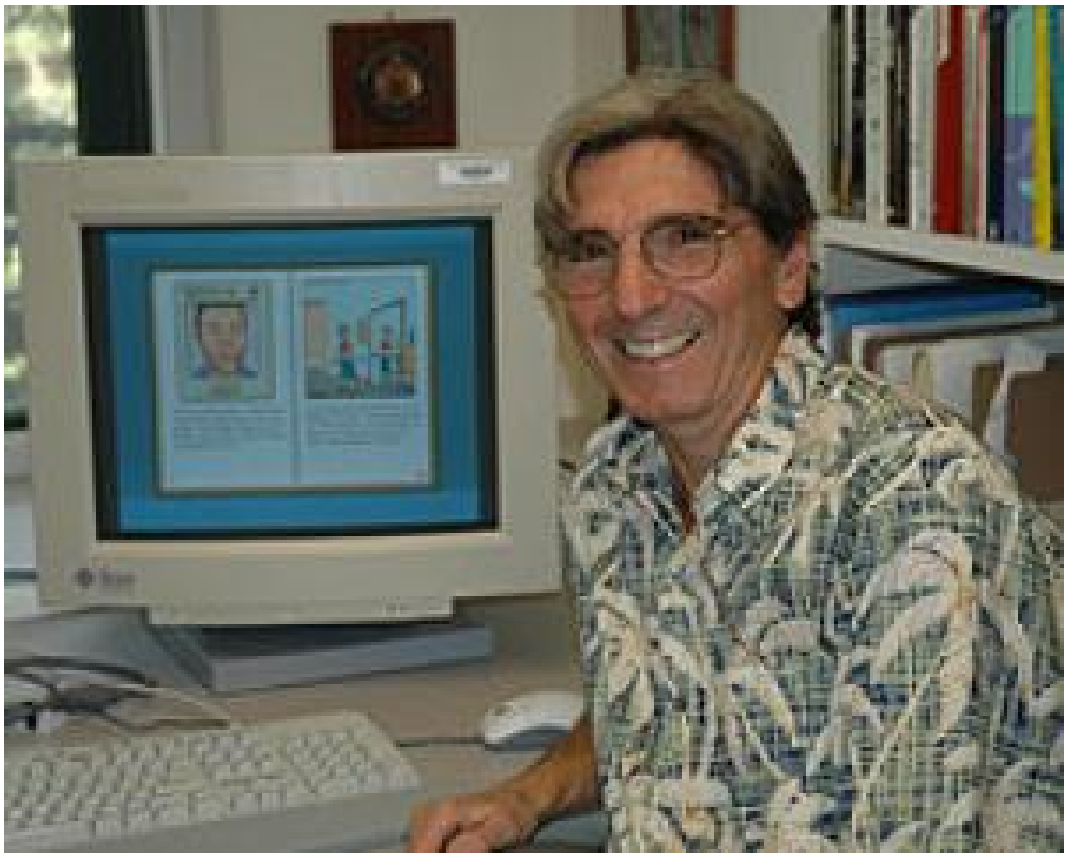
Other authors of the PNAS paper are Aravind Srinivasan and Karthik Viswanathan, postdoctoral associates in MIT's Department of Biological Engineering (BE); Rahul Raman, research scientist in BE; Aarthi Chandrasekaran, graduate student in BE; S. Raguram, visiting scientist in BE; Viswanathan Sasisekharan, visiting scientist in the Harvard-MIT Division of Health Sciences and Technology, and Terrence Tumpey of the Centers for Disease Control and Prevention.

The research was funded by the National Institute of General Medical Sciences and the Singapore-MIT Alliance for Research and Technology (SMART).

Adapted from materials provided by Massachusetts Institute of Technology.

http://www.sciencedaily.com:80/releases/2008/02/080218172441.htm

Animated Computer Tutors Help Remedial Readers, Language Learners, Autistic Children



Dominic Massaro has shown that tools developed by researchers exploring language and speech comprehension can be powerful aids for remedial readers, children with language challenges, and anyone learning a second language. (Credit: Photo by Jennifer McNulty)

ScienceDaily (Feb. 19, 2008) — Tools developed by researchers exploring language and speech comprehension can be powerful aids for remedial readers, children with language challenges, and anyone learning a second language, according to psychology professor Dominic Massaro of the University of California, Santa Cruz.

Massaro is a cognitive researcher whose breakthroughs have advanced researchers' understanding of the importance of face-to-face interaction in speech comprehension.

Massaro has developed computer-assisted speech and language tutors that use natural human speech to model language articulation. This sophisticated technology, which has helped autistic and hearing-impaired children, is now being incorporated into Scholastic's System 44 new remedial reading program for California schoolchildren, and the software is being tailored to help with the acquisition of languages, including Arabic.

"When you're learning a new language, it's helpful to see how the words are formed," said Massaro. "For instance, in Arabic, segments are articulated at the back of the throat." Massaro's facial animation software features a realistic tongue and palate that students can access in dynamic sideview cutaways of the tongue, jaw, and teeth. Combining such visual cues with sound boosts comprehension--and mimics the natural processes that laboratory experiments by Massaro and others have illuminated.

"People often have difficulty pronouncing and discriminating certain sounds in foreign languages," said W. Lewis Johnson, CEO of Alelo, an interactive computer gaming startup that uses speech recognition to

teach foreign languages to players in simulated environments like Iraq. "Baldi (Massaro's animated tutor) is a potentially useful tool for helping language learners to overcome these difficulties."

During a recent presentation at the Defense Language Institute in Monterey, CA, Massaro emphasized the value of an animated tutor in second-language acquisition. "Working with Baldi can be less intimidating because students don't feel shy about making mistakes," he said, adding that students can practice outside the classroom and get feedback when teachers are unavailable.

"The ability to perceive speech is based on the integration of visual and auditory information," said Massaro, whose Animated Speech Corporation has produced software that features an animated tutor that teaches vocabulary, grammar, pronunciation, and speech articulation. The software is in use by hard-of-hearing students at the Tucker-Maxon Oral School in Portland and the Bay School for autistic children in Santa Cruz.

Massaro will participate in a panel discussion of advances in language and speech science at the annual meeting of the American Association for the Advancement of Science in Boston.

Adapted from materials provided by University of California - Santa Cruz.

http://www.sciencedaily.com:80/releases/2008/02/080214153532.htm

Child Obesity Seen As Fueled By Spanish Language TV Ads

ScienceDaily (Feb. 19, 2008) — Spanish-language television is bombarding children with so many fast-food commercials that it may be fueling the rising obesity epidemic among Latino youth, according to research led by pediatricians from the Johns Hopkins Children's Center. Latino children, who make up one-fifth of the U.S. child population, also have the highest obesity and overweight rates of all ethnic groups.

"While we cannot blame overweight and obesity solely on TV commercials, there is solid evidence that children exposed to such messages tend to have unhealthy diets and to be overweight," says study lead investigator Darcy Thompson, M.D., M.P.H., a pediatrician at Hopkins Children's.

Past research among English-speaking children has shown that TV ads influence food preferences, particularly among the more impressionable young viewers.

Researchers reviewed 60 hours of programming airing between 3 p.m. and 9 p.m., heavy viewing hours for school-age children, on Univision and Telemundo, the two largest Spanish-language channels in the United States, reaching 99 percent and 93 percent of U.S. Latino households, respectively. Univision content was recorded from its national network cable in Seattle, and Telemundo content was recorded on a local carrier in Tucson, Ariz.

Tallying two or three food commercials each hour, the investigators said one-third specifically targeted children. Nearly half of all food commercials featured fast food, and more than half of all drink commercials promoted soda and drinks with high sugar content.

To counter the effects of food commercials, the researchers suggest, young children should be restricted to two hours a day or less of TV viewing and parents should talk to them about healthy diet and food choices. Children younger than 2 should not be allowed to watch any TV, pediatricians advise.

Other recommendations:

- Pediatricians caring for Latino children should be aware of their patients' heavy exposure to food ads and the possible effects.
- Public health officials should urge policy makers to limit food advertising to children, something many European countries are already doing.

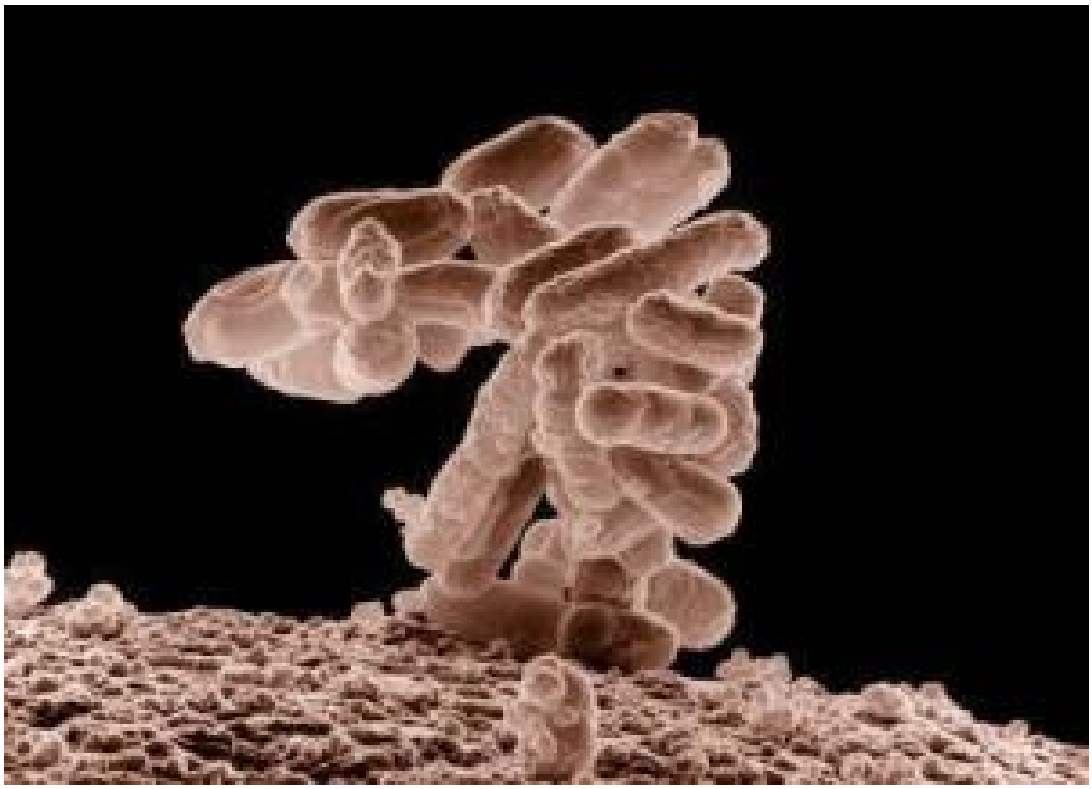
A report on the study, funded by the Robert Wood Johnson Foundation, was released online ahead of print in the Journal of Pediatrics.

Co-investigators in the study: Glen Flores, M.D., of the University of Texas; and Beth Ebel, M.D., MSc., M.P.H., and Dimitri Christakis, M.D., M.P.H., University of Washington, Seattle.

Adapted from materials provided by Johns Hopkins Medical Institutions, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80/releases/2008/02/080218155627.htm

Long-sought Test For Direct Detection Of Disease-causing E. Coli Bacteria Developed



Researchers have developed a test for direct detection of disease-causing E. coli bacteria. This photo shows an electron micrograph of a bacteria cluster. (Credit: Courtesy of USDA-Agricultural Research Service)

ScienceDaily (Feb. 19, 2008) — Biochemists in Japan are reporting development of a long-sought direct test for identifying the presence E. coli bacteria that get into water and food as a result of fecal contamination. That contamination causes millions of cases of food poisoning and other gastrointestinal illness around the world each year.

In the report,* Yasunori Tanji and colleagues point out that tests now in use do not directly identify E. coli. Instead, these tests detect "coliform" bacteria that health officials use as indicators for fecal contamination. Coliforms, however, can originate from natural sources, and are not always reliable indicators of fecal contamination. Direct tests for E. coli do exist, but are too time-consuming and complex for general use.

The new study describes successful use of genetically engineered viruses that infect E. coli to identify a wide range of E. coli strains found in sewage. Researchers first engineered the viruses to be harmless to E. coli. Then they gave the viruses genes to produce green fluorescent proteins.

The resulting viruses reveal the presence of E. coli by lighting up and glowing after infecting the bacteria. The test uses a fluorescent microscope to detect the glow and the presence of disease-causing bacteria, and takes only a few hours.

*The study "Detection of Escherichia coli with Fluorescent Labeled Phages That Have a Broad Host Range to E. coli in Sewage Water"is scheduled for the April 4 issue of ACS' Biotechnology Progress.

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

http://www.sciencedaily.com:80/releases/2008/02/080218160856.htm

Personalized Medicine Can Cut Breast Cancer Risk

Dr. Funmi Olopade counsels a patients in the Cancer Risk Clinic at the University of Chicago Medical Center. (Credit: Dan Dry for the University of Chicago Medical Center)

ScienceDaily (Feb. 19, 2008) — The time has come for breast cancer risk assessment, counseling and genetic testing to move from cancer specialists to the realm of primary care, according to a presentation at the AAAS annual meeting, held this year in Boston.

"A growing body of evidence has documented the benefits of preventive measures for high-risk women including those with mutations in the BRCA1 and BRCA2 genes," said Funmi Olopade, MD, the Walter L Palmer Distinguished Service professor of medicine and director of the Cancer Risk Clinic at the University of Chicago Medical Center. "Referral for cancer-risk assessment and BRCA testing in the primary care setting is a necessary next step towards personalized medicine for women at risk for breast cancer."

Most high-risk women present in the primary care setting, she said. Primary care physicians should learn about the genetics of cancer risk, take a comprehensive personal and family history and advise patients who appear to be at increased risk about the plusses, minuses and limitations of genetic testing and risk-reduction strategies.

Physicians now have enough information to help patients understand the consequences of genetic testing, she added. Studies have found that genetic counseling and testing do not cause adverse psychological effects. There is convincing data on the risk reduction associated with prophylactic surgery--removal of the breasts and or ovaries to prevent cancer in those with known mutations. And preventive measures for those at risk now extend beyond pre-emptive surgery to intensive screening and chemoprevention.

"More than ten years after BRCA1 and BRCA2 were identified as major breast and ovarian cancer susceptibility genes," Olopade added, "primary care providers should embrace genetic risk assessment and BRCA mutation testing."

There is still a great deal that we don't know about these cancer-causing mutations, she added. The frequency and impact of BRCA1 and BRCA2 in various ethnic groups is still poorly understood, with

conflicting results clouding the picture. As a consequence, genetic testing is underused by many ethnic groups.

Scientists are still finding new mutations of these genes. Some of these mutations increase disease risk and some may not. These genes may also interact with the environment or with other genes in ways that could modify their effects.

Even the methods of genetic testing can vary. Some tests look only for common mutations; others sequence the entire gene and look for tiny variations.

"There is still a great deal that we do not know about the role of these genes in inherited as well as sporadic breast cancer," said Olopade. "But we do know that mutation of these genes is common in families with hereditary breast cancer and among young women with breast cancer and that when we know a patient has a mutation there are several options to reduce the risk of breast cancer."

No other predictor is as powerful as an inherited mutation in the tumor-suppressor genes BRCA1 and BRCA2. "Our goal," Olopade said, "is to make this knowledge more and more available to patients, and that has to begin in the primary care setting. Only then can we hope to reap the benefits of individualized medicine."

Adapted from materials provided by University of Chicago Medical Center.

http://www.sciencedaily.com:80/releases/2008/02/080215103242.htm

Greatest Technological Research Challenges Of The 21st Century Identified By Expert Panel

ScienceDaily (Feb. 19, 2008) — A panel of 18 maverick thinkers, convened by the National Academy of Engineering (NAE), recently identified what they consider to be the greatest technological research challenges facing society in the coming century.

Notable panelists on the NAE committee include former director of the National Institutes of Health Bernadine Healy; Google co-founder Larry Page; geneticist and businessman J. Craig Venter, Nobel Laureate Mario Molina, inventor and futurist Ray Kurzweil, and climate change expert Rob Socolow.

In the interview below, Socolow, a professor of mechanical and aerospace engineering at Princeton University, expands upon the NAE Grand Challenges project and the role that technological innovation plays in a vibrant society. A complete list of the 14 Grand Challenges is provided at the end of this Q&A with Socolow.

What exactly is the National Academy of Engineering's Grand Challenges project?

In some respects we were given a crazy assignment: to identify and rank the greatest engineering challenges that lie ahead in the 21st century.

Ultimately we didn't find it within our intellectual powers to rank these challenges. How do you rank the eradication of poverty versus keeping the planet habitable versus avoiding nuclear war? Instead we came up with broad categories of the challenges that lie ahead and within those categories identified specific initiatives.

What are those broad categories?

The first broad category encompasses environmental wholeness -- the need for humans to take care of our earthly home and to be good stewards of the environmental quality that we depend upon.

The second category was our own wellness -- the medical side of human life.

The third category acknowledges that we have a dark side as human beings ourselves and that our lives have a certain precariousness. We lumped challenges in this category under the word "vulnerability." It would be very nice if we could omit this category and attend only to environmental and medical well-being. But we live on a planet that experiences earthquakes and tsunamis. And we are a species that causes trouble for itself. We have a streak in us as humans that we have to recognize and contend with.

The fourth category we refer to as the joy of living. After you've got health and environmental soundness and you feel protected against the bad side of both human nature and Mother Nature, there is still something else to aspire to -- self-knowledge and enlightenment.

The 20th century brought incredible advances in our understanding of our universe, our solar system, our Earth, our own DNA -- we have so much more of a sense of time and space beyond where our ancestors were 150 years ago. Engineering was the fulcrum that tipped open our world to these discoveries. It will play a similar role in the future, contributing to new understandings of our surroundings, our history, our science, our cultures -- contributing to our sense of what it means to be human.

Why do we need to identify grand challenges for engineering?

In part, this is about communication with the public. Many salaries are paid out of public funds -- for teaching and for research. What is the return on this investment? We need to make sure that people understand how past investments in science and engineering have improved human life. Engineering has delivered many successes: our electrified world, indoor plumbing, air travel -- we take these things for granted but we shouldn't. No doubt there is a down side to, say, the automobile or to electrical power.

These engineering successes can end up posing new engineering challenges. Notably, how do we make these innovations work on a finite planet?

Without investments made by previous generations, we would not enjoy the seemingly invisible infrastructure that makes our modern lives possible. It goes without saying that if we don't make similar investments now we will rob future generations of the quality of life that they should enjoy.

The other important motivation for bringing attention to the grand challenges that lie ahead for engineering is that we want to make sure that young people know that engineering is an exciting profession, one that makes a difference to society.

What specific initiatives in the report are most compelling to you personally?

In terms of keeping our planet habitable, I would have to point to the challenges of managing carbon and nitrogen on a planetary scale. Managing carbon -- which is produced when we burn fossil fuels -- by capturing and sequestering carbon dioxide, has gotten a lot of media attention, given the concerns over global warming. It's a challenge my colleagues and I at Princeton have been working on for many years,

Managing nitrogen and avoiding dangerous interference with the nitrogen cycle is an engineering grand challenge that is not so well-known. In the process of fertilizing the planet we are massively increasing the amount of biologically available nitrogen on the planet. So we are not just warming the planet, we are fertilizing the planet. In both cases you are creating ecological change and disturbance. We fertilize the cornfields of Iowa and the nitrogen flows down the Mississippi. There is a region in the Gulf of Mexico where so much fertilization has been deposited that it is a dead zone during certain times of the year. So we have a situation where the ecological system bites back.

Could you say something about specific challenges within the other broad categories?

In the category of health, individualized medicine is paramount. We need to aspire toward a medical model that takes into account the particularities of the whole person, and part of this is an engineering challenge.

In the category of vulnerabilities, we outlined some of the important technological challenges in detecting surreptitious nuclear material and the importance of taking into account the whole fuel cycle when it comes to nuclear energy. We don't want to engineer energy systems that create what might be considered an attractive nuisance -- systems that open up ways for nuclear material to fall into the wrong hands. Also, since we live in an increasingly networked virtual world, cybersecurity is a fundamental engineering challenge.

In terms of "joy of living" the challenge that I find most compelling is individualized learning. New technologies offer extraordinary opportunities for learning to become tailored to personal aptitudes and learning styles.

You said that the committee declined to rank the grand engineering challenges of the 21st century. But National Academy of Engineering is inviting the public to do so?

Yes, people can go to the National Academy of Engineering website to download a copy of the report and to cast their vote on what they consider the most important challenges. You can find the website here: http://www.engineeringchallenges.org/

The public may ultimately come to the same conclusion as the committee -- that these challenges cannot be ranked because they are all so important. But we need to get everyone in on the debate and the discussion. After all, these are challenges and opportunities that ultimately affect all of society.

Former Secretary of Defense William Perry chaired the NAE panel, which released its report in Boston at the national meeting of the American association for the Advancement of Science.

The NAE grand challenges

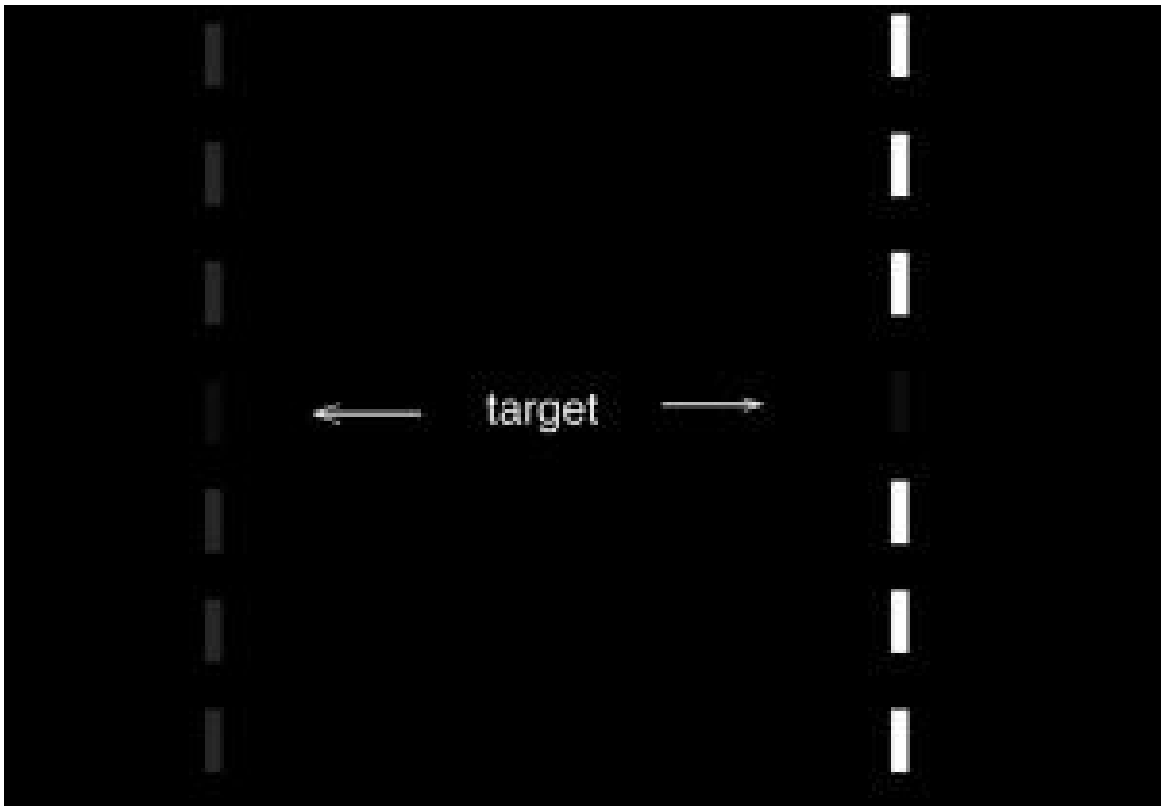
- Engineering better medicines;
- Advancing health informatics;
- Providing access to clean water;
- Providing energy from fusion;
- Making solar energy economical;
- Restoring and improving urban infrastructure;
- Enhancing virtual reality;
- Reverse engineering the brain;
- Exploring natural frontiers;
- Advancing personalized learning;
- Developing carbon sequestration methods;
- Managing the nitrogen cycle;
- Securing cyberspace,
- Preventing nuclear terror.

A full list of the panel members, and their biographies, can be found at http://www.engineeringchallenges.org/cms/7124.aspx

Adapted from materials provided by Princeton University, Engineering School.

http://www.sciencedaily.com:80/releases/2008/02/080215151157.htm

How Believing Can Be Seeing: Context Dictates What We Believe We See



The same dim vertical target rectangle centered in two different contexts is more visible in the left vague context. (Credit: Image courtesy of University College London)

ScienceDaily (Feb. 19, 2008) — Scientists at UCL (University College London) have found the link between what we expect to see, and what our brain tells us we actually saw. The study reveals that the context surrounding what we see is all important -- sometimes overriding the evidence gathered by our eyes and even causing us to imagine things which aren't really there.

The paper reveals that a vague background context is more influential and helps us to fill in more blanks than a bright, well-defined context. This may explain why we are prone to 'see' imaginary shapes in the shadows when the light is poor.

Eighteen observers were asked to concentrate on the centre of a black computer screen. Every time a buzzer sounded they pressed one of two buttons to record whether or not they had just seen a small, dim, grey 'target' rectangle in the middle of the screen. It did not appear every time, but when it did appear it was displayed for just 80 milliseconds (80 one thousandths of a second).

"People saw the target much more often if it appeared in the middle of a vertical line of similar looking, grey rectangles, compared to when it appeared in the middle of a pattern of bright, white rectangles. They even registered 'seeing' the target when it wasn't actually there," said Professor Zhaoping, lead author of the paper. "This is because people are mentally better prepared to see something vague when the surrounding context is also vague. It made sense for them to see it -- so that's what happened. When the target didn't match the expectations set by the surrounding context, they saw it much less often.

"Illusionists have been alive to this phenomenon for years," continued Professor Zhaoping. "When you see them throw a ball into the air, followed by a second ball, and then a third ball which 'magically' disappears, you wonder how they did it. In truth, there's often no third ball - it's just our brain being deceived by the context, telling us that we really did see three balls launched into the air, one after the other.

"Contrary to what one might expect, it is a vague rather than a bright and clearly visible context that most strongly permits our beliefs to override the evidence and fill in the blanks. In fact, a bright and clearly visible context actually overrides the evidence in the opposite direction - suppressing our 'seeing' of the vague target even when it is present.

"Mathematical modelling suggests that visual inference through context is processed in the brain beyond the primary visual cortex. By starting with a relatively simple experiment such as this, where visual input can be more easily and systematically manipulated, we are gaining a better understanding of how context influences what we see. Further studies along these lines can hopefully enable us to dissect the workings behind more complex and wondrous illusions."

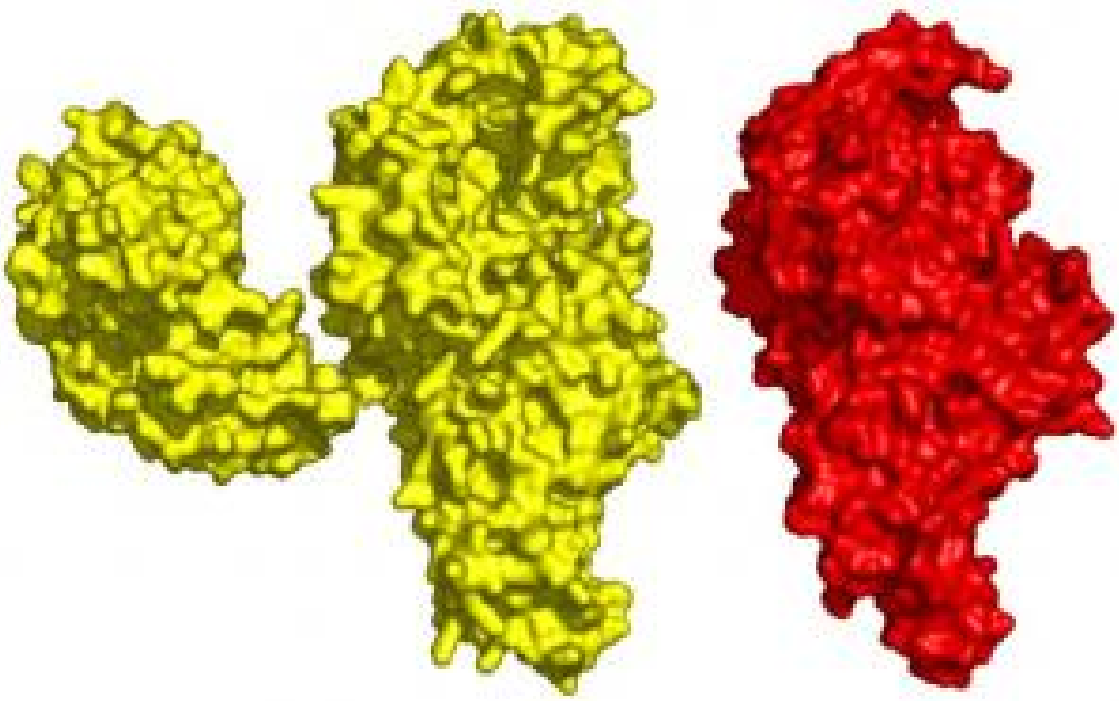
Journal reference: Filling-in and suppression of visual perception from context -- a Bayesian account of perceptual biases by contextual influences, by Professor Li Zhaoping and Dr Li Jingling appears in the 15 February issue of the journal PLoS Computational Biology.

The research was funded by the Gatsby Charitable Foundation and a Cognitive Science Foresight Grant.

Adapted from materials provided by University College London.

http://www.sciencedaily.com:80/releases/2008/02/080215103210.htm

New Control Mechanism For Genetic Code Translation Discovered In Bacteria



Bacteria M. Penetrans has an extension in its enzyme MetRS (in yellow) which makes it different from the rest of organisms. Studying this enzyme, the scientists discovered a new mechanism for genetic code translation. (Credit: Image courtesy of Institute for Research in Biomedicine)

ScienceDaily (Feb. 19, 2008) — Almost all organisms, from bacteria to human beings, share the same genetic code, a group of universal instructions used to convert DNA or RNA sequences into proteins, the "building blocks" of life. Identification of the evolutionary differences between the system for the translation of the genetic code in humans and other organisms, such as bacteria in this case, are useful, for example, for the design of new antibiotics.

Researchers at the Institute for Research in Biomedicine (IRB Barcelona) have discovered that an essential molecular process, namely the determination of the start of protein synthesis, until now considered to be the same for all living organisms, differs in the bacteria Mycoplasma penetrans, a human pathogen that affects the respiratory tract. M. penetrans affects immuno-depressed patients, such as those infected by the HIV virus and some cancer patients. The results of this study have been published in the latest issue of Molecular Cell.

The leader of the study, Lluís Ribas de Pouplana, researcher at IRB Barcelona and head of the Gene Translation Laboratory, explains, "our work strengthens the theory that many of the components of the initial genetic code, established 3,500 million years ago, have matured separately between distinct branches of evolution: bacteria, archaea and eukaryotes".

The origin of the genetic code is one of the issues in evolution biology in which most questions remain unanswered. "The translation machinery is so complex, so universal and so essential that it is difficult to imagine how it arose and how it has evolved. Thanks to these discoveries, we can observe that the genetic code and the protein translation system are not as universal as once thought and that some of the key components of the translation system appeared much later", concludes Ribas.

In fact, what these researchers have discovered is a difference in the mechanism used by bacteria to differentiate between methionine and isoluecine, two essential amino acids for protein formation. Specifically, methionine is the amino acid used universally to initiate protein formation.

An excessively large enzyme: a false clue for the discovery

As commonly occurs in science, the discovery of this new mechanism was by chance. The researchers were studying an enzyme called methionine-tRNA-synthetase (MetRS), which is found in all living organisms, but in the Mycoplasma bacteria it has an extension that makes it much larger. "We were studying this enzyme in order to elucidate the function of this extension", explains Ribas.

The function of MetRS in all organisms is to take methionine and attach it to the RNA transcript of methionine in order to tell the cell when it must initiate the formation of a certain protein. This task is complicated because the RNA transcript of isoleucine is practically identical. "We then saw that the Mycoplasma enzyme distinguished between the RNA transcript of methionine and the transcript of isoleucine in a more simple and proficient manner that that observed to date in other organisms".

The most logical deduction was that the extension on this enzyme was a crucial part of this distinct recognition system. However, when the researchers removed this extension in the laboratory, the choice between the two RNA transcipt continued to operate flawlessly. "We still do now know the function of this extension of the enzyme in Mycoplasma, but in the meantime we have discovered a new mechanism of control in the translation system, which in addition, we have observed is shared by other bacteria".

This discovery contributes to an improved understanding of the evolution of the genetic code and also demonstrates its plasticity. "In my opinion a certain degree of complexity shown by the genetic code is one of the main parameters that determines the point at which organisms begin to evolve", explains the researcher. The fundamental differences between the metabolism of human pathogens and the human being may represent the key for the development of new therapies to treat infection.

Adapted from materials provided by Institute for Research in Biomedicine.

http://www.sciencedaily.com:80/releases/2008/02/080214130345.htm

Does Socializing Make Us Smarter?

ScienceDaily (Feb. 19, 2008) — Humans are social animals; we spend much of our time with others in groups. We are also wise. It is not our size, speed, or strength that distinguishes us from other mammals, but our intelligence. How might these two features -- being social and being smart -- go together?

Article lead author Oscar Ybarra* and his colleagues at the University of Michigan explored the possibility that social interaction improves mental functioning. In a series of related studies, they tested the participants' level of cognitive functioning, comparing it to the frequency of participants' social interactions.

They found that people who engaged in social interaction displayed higher levels of cognitive performance than the control group. Social interaction aided intellectual performance.

"Social interaction," the authors suggest, "helps to exercise people's minds. People reap cognitive benefits from socializing," They speculate that social interaction "exercises" cognitive processes that are measured on intellectual tasks. "It is possible," the authors conclude, "that as people engage socially and mentally with others, they receive relatively immediate cognitive boosts."

*The article, "Mental Exercising Through Simple Socializing: Social Interaction Promotes General Cognitive Functioning," written by Oscar Ybarra, Eugene Burnstein, Piotr Winkielman, Matthew C. Keller, Melvin Manis, Emily Chan, and Joel Rodriguez of the University of Michigan, and published by SAGE in the February issue of Personality and Social Psychology Bulletin.
http://psp.sagepub.com/cgi/reprint/34/2/248

Adapted from materials provided by Sage Publications, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80/releases/2008/02/080215135707.htm

Solar Cell Directly Splits Water To Produce Recoverable Hydrogen

Penn State researchers have a proof-of-concept device that can use sunlight to split water and produce recoverable hydrogen. (Credit: iStockphoto)

ScienceDaily (Feb. 19, 2008) — Plants trees and algae do it. Even some bacteria and moss do it, but scientists have had a difficult time developing methods to turn sunlight into useful fuel. Now, Penn State researchers have a proof-of-concept device that can split water and produce recoverable hydrogen.

"This is a proof-of-concept system that is very inefficient. But ultimately, catalytic systems with 10 to 15 percent solar conversion efficiency might be achievable," says Thomas E. Mallouk, the DuPont Professor of Materials Chemistry and Physics. "If this could be realized, water photolysis would provide a clean source of hydrogen fuel from water and sunlight."

Although solar cells can now produce electricity from visible light at efficiencies of greater than 10 percent, solar hydrogen cells -- like those developed by Craig Grimes, professor of electrical engineering at Penn State -- have been limited by the poor spectral response of the semiconductors used. In principle, molecular light absorbers can use more of the visible spectrum in a process that would mimic natural photosynthesis. Photosynthesis uses chlorophyll and other dye molecules to absorb visible light.

So far, experiments with natural and synthetic dye molecules have produced either hydrogen or oxygen-using chemicals consumed in the process, but have not yet created an ongoing, continuous process. Those processes also generally would cost more than splitting water with electricity. One reason for the difficulty is that once produced, hydrogen and oxygen easily recombine. The catalysts that have been used to study the oxygen and hydrogen half-reactions are also good catalysts for the recombination reaction.

Mallouk and W. Justin Youngblood, postdoctoral fellow in chemistry, together with collaborators at Arizona State University, developed a catalyst system that, combined with a dye, can mimic the electron transfer and water oxidation processes that occur in plants during photosynthesis. They reported the

results of their experiments at the annual meeting of the American Association for the Advancement of Science, Feb. 17 in Boston.

The key to their process is a tiny complex of molecules with a center catalyst of iridium oxide molecules surrounded by orange-red dye molecules. These clusters are about 2 nanometers in diameter with the catalyst and dye components approximately the same size. The researchers chose orange-red dye because it absorbs sunlight in the blue range, which has the most energy. The dye used has also been thoroughly studied in previous artificial photosynthesis experiments.

They space the dye molecules around the center core leaving surface area on the catalyst for the reaction. When visible light strikes the dye, the energy excites electrons in the dye, which, with the help of the catalyst, can split the water molecule, creating free oxygen.

"Each surface iridium atom can cycle through the water oxidation reaction about 50 times per second," says Mallouk. "That is about three orders of magnitude faster than the next best synthetic catalysts, and comparable to the turnover rate of Photosystem II in green plant photosynthesis." Photosystem II is the protein complex in plants that oxidizes water and starts the photosynthetic process.

The researchers impregnated a titanium dioxide electrode with the catalyst complex for the anode and used a platinum cathode. They immersed the electrodes in a salt solution, but separated them from each other to avoid the problem of the hydrogen and oxygen recombining. Light need only shine on the dye-sensitized titanium dioxide anode for the system to work. This type of cell is similar to those that produce electricity, but the addition of the catalyst allows the reaction to split the water into its component gases.

The water splitting requires 1.23 volts, and the current experimental configuration cannot quite achieve that level so the researchers add about 0.3 volts from an outside source. Their current system achieves an efficiency of about 0.3 percent.

"Nature is only 1 to 3 percent efficient with photosynthesis," says Mallouk. "Which is why you can not expect the clippings from your lawn to power your house and your car. We would like not to have to use all the land area that is used for agriculture to get the energy we need from solar cells."

The researchers have a variety of approaches to improve the process. They plan to investigate improving the efficiency of the dye, improving the catalyst and adjusting the general geometry of the system. Rather than spherical dye catalyst complexes, a different geometry that keeps more of the reacting area available to the sun and the reactants might be better. Improvements to the overall geometry may also help.

"At every branch in the process, there is a choice," says Mallouk. "The question is how to get the electrons to stay in the proper path and not, for example, release their energy and go down to ground state without doing any work."

The distance between molecules is important in controlling the rate of electron transfer and getting the electrons where they need to go. By shortening some of the distances and making others longer, more of the electrons would take the proper path and put their energy to work splitting water and producing hydrogen.

The U.S. Department of Energy supported this research.

Adapted from materials provided by Penn State.

http://www.sciencedaily.com:80/releases/2008/02/080217170412.htm

First stars 'may have been dark'

By Roland Pease
BBC Radio Science Unit

The first stars to appear in the Universe may have been powered by dark matter, according to US scientists.

Normal stars are powered by nuclear fusion reactions, where hydrogen atoms meld to form heavier helium.

But when the Universe was still young, there would have been abundant dark matter, made of particles called Wimps: Weakly Interacting Massive Particles.

These would have fused together and obliterated each other long before nuclear fusion had the chance to start.

As a result, the first stars would have looked quite different from the ones we see today, and they may have changed the course of the Universe's evolution - or at least held it up.

The theory, published in the journal Physical Review Letters, depends on particles that astronomers can't see, but are certain exist, and physicists have never detected. But the indirect evidence for their existence is overwhelming.

"Dark matter particles make up more than three-quarters of the mass of the Universe," says theoretical physicist Katherine Freese from the University of Michigan.

"In fact, billions of them are passing through each of us every second."

In the early Universe, there would have been even more.

Changing course

The nature of the first stars has long puzzled astronomers. Immediately after the Big Bang, the Universe expanded and cooled, so that for millions of years it was filled with dark, featureless hydrogen and helium - and perhaps Wimps.

Astronomers can see that there were normal stars 700 million years after the Big Bang - the Hubble Telescope looking to the edges of the Universe, which is like looking back billions of years in time, can see whole galaxies of them.

But how did the Universe change course?

The leading theory is that gravity pulled balls of dark matter and hydrogen together.

"These 'haloes', as we call them, are about a million times as massive as the Sun, and the first stars formed inside their centres," Professor Freese told the BBC.

It had been thought the hydrogen brought together by these dark matter haloes would collapse to make the first small stars, and would start to make inside themselves the first new elements - carbon, oxygen, silicon and other materials needed by planets and life.

But the new paper says reactions between the Wimps, colliding and annihilating each other, would have generated enough heat to keep the protostars inflated - like hot air balloons. And as more Wimps rained down on them the heating would have kept going.

These giant, diffuse stars could have filled the orbit of the Earth.

The details of what the stars would have looked like have yet to be worked out. But in five years' time, Nasa will be launching its James Webb Space Telescope (JWST), the successor to the Hubble Space Telescope, and that might be able see right back to these "dark" stars.

There is also the intriguing possibility, says Professor Freese, that in some corner of our local Universe, there may be a few survivors lurking unnoticed.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7252428.stm

Published: 2008/02/19 13:30:00 GMT

Stabilizing Climate Requires Near-zero Carbon Emissions

Halfway measures won't do. To stabilize our planet's climate, we need to find ways to kick the carbon habit altogether. (Credit: iStockphoto/Jaap Hart)

ScienceDaily (Feb. 18, 2008) — Now that scientists have reached a consensus that carbon dioxide emissions from human activities are the major cause of global warming, the next question is: How can we stop it? Can we just cut back on carbon, or do we need to go cold turkey? According to a new study by scientists at the Carnegie Institution, halfway measures won't do the job. To stabilize our planet's climate, we need to find ways to kick the carbon habit altogether.

In the study, to be published in Geophysical Research Letters, climate scientists Ken Caldeira and Damon Matthews used an Earth system model at the Carnegie Institution's Department of Global Ecology to simulate the response of the Earth's climate to different levels of carbon dioxide emission over the next 500 years. The model, a sophisticated computer program developed at the University of Victoria, Canada, takes into account the flow of heat between the atmosphere and oceans, as well as other factors such as the uptake of carbon dioxide by land vegetation, in its calculations.

This is the first peer-reviewed study to investigate what level of carbon dioxide emission would be needed to prevent further warming of our planet.

"Most scientific and policy discussions about avoiding climate change have centered on what emissions would be needed to stabilize greenhouse gases in the atmosphere," says Caldeira. "But stabilizing greenhouse gases does not equate to a stable climate. We studied what emissions would be needed to stabilize climate in the foreseeable future."

The scientists investigated how much climate changes as a result of each individual emission of carbon dioxide, and found that each increment of emission leads to another increment of warming. So, if we want to avoid additional warming, we need to avoid additional emissions.

With emissions set to zero in the simulations, the level of carbon dioxide in the atmosphere slowly fell as carbon "sinks" such as the oceans and land vegetation absorbed the gas. Surprisingly, however, the model

predicted that global temperatures would remain high for at least 500 years after carbon dioxide emissions ceased.

Just as an iron skillet will stay hot and keep cooking after the stove burner's turned off, heat held in the oceans will keep the climate warm even as the heating effect of greenhouse gases diminishes. Adding more greenhouse gases, even at a rate lower than today, would worsen the situation and the effects would persist for centuries.

"What if we were to discover tomorrow that a climate catastrophe was imminent if our planet warmed any further? To reduce emissions enough to avoid this catastrophe, we would have to cut them close to zero — and right away," says Caldeira.

Global carbon dioxide emissions and atmospheric carbon dioxide concentrations are both growing at record rates. Even if we could freeze emissions at today's levels, atmospheric carbon dioxide concentrations would continue to increase. If we could stabilize atmospheric carbon dioxide concentrations, which would require deep cuts in emissions, the Earth would continue heating up. Matthews and Caldeira found that to prevent the Earth from heating further, carbon dioxide emissions would, effectively, need to be eliminated.

While eliminating carbon dioxide emissions may seem like a radical idea, Caldeira sees it as a feasible goal. "It is just not that hard to solve the technological challenges," he says. "We can develop and deploy wind turbines, electric cars, and so on, and live well without damaging the environment. The future can be better than the present, but we have to take steps to start kicking the CO2 habit now, so we won't need to go cold turkey later."

Journal reference: Matthews, H. D., and K. Caldeira (2008), Stabilizing climate requires near-zero emissions, Geophysical Research Letters, doi:10.1029/2007GL032388, in press.

Adapted from materials provided by Carnegie Institution.

http://www.sciencedaily.com:80/releases/2008/02/080215103252.htm

Egypt's Earliest Agricultural Settlement Unearthed

A fragment of a bangle made of a shell found only at the Red Sea suggests possible trade links with the cradle of agriculture in the Near East. (Credit: Copyright UC Regents)

ScienceDaily (Feb. 18, 2008) — Archaeologists from UCLA and the University of Groningen (RUG) in the Netherlands have found the earliest evidence ever discovered of an ancient Egyptian agricultural settlement, including farmed grains, remains of domesticated animals, pits for cooking and even floors for what appear to be dwellings.

The findings, which were unearthed in 2006 and are still being analyzed, also suggest possible trade links with the Red Sea, including a thoroughfare from Mesopotamia, which is known to have practiced agriculture 2,000 years before ancient Egypt.

"By the time of the Pharaohs, everything in ancient Egypt centered around agriculture," said Willeke Wendrich, the excavation's co-director and an associate professor of Near Eastern languages and cultures at UCLA. "What we've found here is a window into the development of agriculture some 2,000 years earlier. We hope this work will help us answer basic questions about how, why and when ancient Egypt adopted agriculture."

Just centimeters below the surface of a fertile oasis located about 50 miles southwest of Cairo, the UCLA-RUG team excavated domestic wheat and barley and found the remains of domesticated animals -- pigs, goats and sheep -- along with evidence of fishing and hunting. None of the varieties of domesticated animals or grains are indigenous to the area, so they would have to have been introduced.

The archaeological team also found a bracelet made of a type of shell only found along the Red Sea, suggesting a possible trade link with the cradle of agriculture in the Near East. In addition, they unearthed clay floors of what may have been simple structures -- possibly posts with some kind of matting overhead.

In the 1920s, British archaeologist Gertrude Caton Thompson found traces of the same domesticated grains in storage pits less than a mile from the current site. After the advent of carbon-dating technology, the grain was dated to 5,200 B.C., making the discovery the earliest evidence of agriculture in ancient

Egypt. To this day, no earlier evidence of agriculture has been found in Egypt. But because no surrounding settlement was ever excavated, all kinds of questions remained about the context in which agriculture began to unfold in ancient Egypt.

"We had evidence that there was agriculture by 5,200 B.C. but not how it was used in a domestic context," said excavation co-leader René Cappers, a professor of paleobotany at the University of Groningen, the second-oldest university in the Netherlands. "Now, for the first time, we have domesticated plants and animals in a village context."

The latest findings date to the Neolithic period, a stage of human development that occurred at various times around world, beginning in 8,600 B.C. Sometimes called the New Stone Age, the period is characterized by the introduction of farming, animal husbandry and a movement away from hunting and gathering and toward a less nomadic way of life, with pots, tools and settlements.

Few clues have been found of Egypt's Neolithic past in the Nile Valley, possibly because they were either buried under silt from the Nile or wiped away when the river changed its course, the archaeologists said. The UCLA-RUG excavation site is located just outside the river valley in what is now a desert region.

With more than three feet of undisturbed strata at the site, the team expects to be able to piece together the evolution of domestication in the area between 5,200 B.C. and about 4,200 B.C.

"The arrival of the entire Neolithic package in ancient Egypt has always been treated as a moment in time, but we're finding stratified layers that will allow us to tease out the development of agriculture in this area as it developed over the course of hundreds of years," said Wendrich, who is one of the core faculty members at UCLA's Cotsen Institute of Archaeology.

Called the Fayum, the oasis where the team is working was surrounded by prehistoric sites, most of which were excavated in the 1920s. Generations of archaeologists had written off the area, until the UCLA-RUG team decided to re-explore the site.

"We knew that the settlement existed, but the site had been under cultivation since the 1960s, so archaeologists assumed it had been destroyed," Wendrich said. "We got to this site in the nick of time."

Modern laser-leveling farming techniques were about to annihilate the site in 2006, but the archaeological team succeed in rescuing the six-acre plot for future research by renting it for a year while they conducted their initial fieldwork. In the meantime, Egypt's Supreme Council of Antiquities has taken steps to permanently protect the site.

The research was funded by the National Geographic Society, UCLA, RUG and private donors on the Directors Council of Cotsen Institute of Archaeology.

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

http://www.sciencedaily.com:80/releases/2008/02/080212131300.htm

Playing games with your mind

Neurofeedback devices could be used for gaming - and for other applications such as robotics

- James Bloom
- The Guardian,
- Thursday February 21 2008

At the Consumer Electronics Show in Las Vegas last month, there was a man anxiously waving his arms at a screen with a giant grey cube on it. But it wasn't just another game. He was wearing a headset lined with brainwave-reading sensors and, as he focused his mind on the task, the cube started to turn in harmony with his movements. The crowd of onlookers was amazed, but they kept their excitement to themselves as he lifted the CGI cube into the air and "pushed" it backwards.

Marco Della Torre is a product engineer at Emotiv, the San Francisco-based company behind this prototype neurofeedback game. "There are a variety of possible applications," he says. "Common fantasies in gaming are enabled by the headset, by the power of your mind."

Sense and sensor ability

Emotiv is just one company enabling games to be hooked up to the pattern of your brainwaves. Improvements in brain-computer interfaces will make the type of device previously confined to psychiatric laboratories available to the general public as some kind of entertainment. According to the developers, the first products should be in stores by the end of this year.

San Jose-based NeuroSky will be one of the first companies to see its technology hit the shelves. It takes a more simplistic approach than Emotiv, with a single-sensor headset that scans the brain for levels of focus, anxiety and the "meditative state". Gameplay adjusts according to the player's state of mind and whatever optimal frequency they have set as a goal.

NeuroSky has signed a number of licensing deals for its sensor and signal-processing technology, notably with Sega Toys. "The complete embedded hardware fits into a lightweight headset, which is Bluetooth

and USB-enabled," says Greg Hyver, vice-president of marketing at NeuroSky. "The headsets should cost around $49 (£25), a similar price to other game peripherals." The company has also completed work on a mind-reading enhancement for mobile phones.

NeuroSky's showcase game features a 3D arena where players have to lift and manipulate objects such as watermelons or cars. The heavier the item, the more focus or relaxation is required. In the multiplayer version, you can throw objects at other players. Directional movement is controlled using the mouse, but winning requires more than quick reflexes and hand-eye coordination.

"This technology is really turning traditional gameplay on its head," says Olafur Palsson, a professor at the University of Carolina who has designed a number of medical and commercial neurofeedback products. "Most games currently just make you zone out. Being able to produce a sharp, clear brain signal, on the other hand, can be very valuable."

Palsson has patented a golf trainer called Zone, which warps the green and adjusts the size of the hole depending on the player's ratio of alpha, beta and theta brainwaves. Lining up the shot would require a high level of focus, associated with high beta and low theta frequencies. The putting stroke would be accompanied by alpha waves, demonstrating relaxation. He doesn't have a release date yet, but says this is just one of a number of products that can also help people train their brain to "rev up" on command.

Mood movements

A team at Keio University in Japan has developed a PC-based system that allows players to walk the virtual hallways of Second Life by the power of thought. Their headset scans activity in three areas of the brain's motor cortex, which control voluntary movement of different limbs.

The avatar walks forward when they focus on moving their feet, and turns when they focus on their right or left arm. The team hopes its system will help reinvigorate patients suffering from paralysis, but as with Emotiv's "Expressiv" technology, it can be used by almost anyone.

Another Silicon Valley company, OLogic, has built a robot called The Brain which follows its owner's orders - if it's in the right mood. It plans to have a commercial product in stores by next year. Ted Larson, one of the founders of the company, says OLogic uses a radio-enabled version of NeuroSky's headset, "so it really looks like mind control".

Yet another product due in the next year or two is software from the French company Musinaut, which selects music appropriate to the user's current or desired mental state. Palsson says there is huge potential for musical applications. "Piano players might want their theta activity to be higher," he says. "In the meditative state, the music plays them, as opposed to them playing the music."

Unlike Michael Persinger's widely publicised 2002 experiment where subjects reported experiencing the "presence" of God while undergoing trans-cranial magnetic stimulation, no one is making such bold claims about the new line of devices.

Nevertheless, there are plenty of new and entertaining applications of neurofeedback technology in the pipeline. Who knows, the next version of Postal might be bundled with a cognitive therapy expansion pack.

http://www.guardian.co.uk/technology/2008/feb/21/research.games

Dance Gems on YouTube
February 20, 2008
By Lisa Jo Sagolla

Unwilling to venture out in the frigid weather, I chose to stay indoors recently and cozy up to my computer. I set myself the task of finding out what that ridiculously popular website YouTube might have to offer for serious dance and movement professionals. Though students and friends of mine rave about the "fabulous" dance videos they find on the site, nothing they've ever described to me has sounded even remotely worthwhile. However, a colleague's insistence that I could unearth "great historical dance footage" on YouTube piqued my interest, enough that I was willing to devote a series of evenings to exploring the site.

As I suspected, the overwhelming majority of what I found was useless garbage. But if one remains tenacious in wading through all the trash, gems do emerge. As my interest lies mainly in the history of American musical-theatre dance, I organized my searches around the names of famous Broadway dancers and choreographers of the past. It's an extremely easy process, even if you're completely lacking in technological know-how: Simply go to www.youtube.com and type anything you want in the search box.

A Treasure-Trove of Musical-Theatre Dance

My most exciting discovery was a song-and-dance duet performed by Bob Fosse and Carol Haney that I had never seen before. No, not the famous 45-second duet they do in the film *Kiss Me, Kate*. This is something completely different: a song-and-dance rendition of Irving Berlin's "I Love a Piano" performed on *The Ed Sullivan Show* Feb. 26, 1956. Though the choreography is far less inventive than in the *Kiss Me, Kate* number, Fosse is wonderfully animated in his quirky movement style, and Haney dances with an elegance that is rarely brought to jazz dance anymore. The video quality of the clip is less than ideal, but the chance to see these two Broadway dance icons performing together is priceless. (The following Web address should bring you directly to the clip: www.youtube.com/watch?v=uM6b4VBrPis.)

And speaking of Broadway dance icons, there is perhaps no greater treat than to see Chita Rivera and

Gwen Verdon performing "Nowadays" and "Hot Honey Rag" from *Chicago*. YouTube offers a number of opportunities to see the duo re-creating their original performance of the numbers. The best one, I think, is a clip from television's *The Mike Douglas Show* that aired about a year after *Chicago* opened on Broadway in 1975. After their performance, Rivera and Verdon are interviewed by the host -- not a terribly probing discussion, but enjoyable nonetheless (www.youtube.com/watch?v=4w5tRzTrqrA). Fans of Chita can also enjoy seeing her perform "Spanish Rose" from *Bye Bye Birdie* on an episode of *The Ed Sullivan Show* aired Nov. 13, 1960, about seven months after the musical's Broadway opening (www.youtube.com/watch?v=KJoSjBGNN5s).

Fosse fans will delight in an amusing segment from a 1950 episode of television's *The Burns and Allen Show*. An almost unrecognizably young and straight-laced Fosse hoofs it up in a trio routine with George Burns and Harrison Muller. Never heard of Harrison Muller? Well, I didn't know much about him either. But in this clip, before the trio, Muller performs a classy solo in which he exhibits an appealingly balletic style of tap dancing. Although it was by a fortuitous accident that I stumbled upon Muller, I must admit that YouTube can play a valuable role in introducing us to dancers about whom we might otherwise know very little (www.youtube.com/watch?v=db6lyqZGo0w).

Some dancers today may know Gower Champion only as the deft director-choreographer of such Broadway musicals as *Bye Bye Birdie* (1960), *Carnival* (1961), *Hello, Dolly*! (1964), and *42nd Street* (1980). But prior to all of that, he and his wife were a highly respected dance team. While those who know the dancing of Marge and Gower Champion are probably familiar with the lively routines they performed in Hollywood musicals, YouTube offers the chance to see a slightly different side of the couple's virtuosic dancing. On an episode of *The Dinah Shore Chevy Show* aired Feb. 21, 1958, the couple performed an unusually slow dance to "A Foggy Day." Their remarkable grace, lyricism, and innovatively balanced lifts evoke a mesmerizing romantic mood (www.youtube.com/watch?v=psgbOYTkD9I).

Bringing Dance History Alive

While it can be terrific fun to discover these rare terpsichorean tidbits on YouTube, a lot of the site's really great historical dance clips are available elsewhere. Many of the most thrilling ones are excerpts from movie musicals or dance documentaries that can be purchased on DVD, rented through Netflix, or borrowed from libraries. Nonetheless, YouTube provides a tremendous service in making these excerpts available to see free of charge. In many instances, stunning dance routines were embedded in truly awful films that you wouldn't necessarily want to waste your money purchasing or even spend your time fast-forwarding through on a hunt for the dance treasures. For example, as much as you may want to watch the enchanting flamenco number danced by Cyd Charisse and Ricardo Montalban in the 1947 film *Fiesta*, choreographed by Eugene Loring, you certainly don't want to sit through the entire lousy movie. On YouTube you can view just the dances: the flamenco duet and "La Bamba," another dance sequence from the film (www.youtube.com/watch?v=opi78lWMz94).

The excerpted dance documentaries, on the other hand, are generally more worthwhile to view in their entirety. But they have often been so poorly marketed or underadvertised that many in the dance community are unaware of their existence or of what kinds of performance footage they include. Here again, YouTube provides some helpful information. It was only while foraging through the site that I learned of an interesting documentary about the history of Ukrainian dance and realized that the recent documentary on Jacques d'Amboise contains extensive footage from 1955 of him dancing Jerome Robbins' "Afternoon of a Faun" with Tanaquil LeClerq.

Lest you think YouTube is only of value to dance-history enthusiasts, my colleague Jane Vorburger, a former dancer with American Ballet Theatre, recently sent me a link to a YouTube clip of an amazing gymnastic ballet performance. Danced by a couple from the Chinese Circus Ballet, it is one of the most advanced demonstrations I've ever seen of ballet technique combined with acrobatic dexterity (www.youtube.com/watch?v=N5lN96dgt_Y). Or if you're interested in seeing the flamboyant choreography of that over-the-top Russian choreographer Boris Eifman -- he's all the rage in certain ballet circles these days -- YouTube offers the opening portion of a new documentary about him and his latest work (www.youtube.com/watch?v=pVTjdr724Ac). You'll also find gorgeous video recordings of Baryshnikov in his dancing prime, as well as footage of him when he was very young dancing *Don*

Quixote in 1969 (www.youtube.com/watch?v=1mYL0N92kC0). There's also exciting footage of the modern-dance pioneer José Limón, the masterful physical comedian Bill Irwin, hip-hop artist Mr. Wiggles, and the powerful tapper Savion Glover. (Just type in their names and lots of goodies will come up.)

An actor friend of mine who got caught up in the spirit of my YouTube explorations decided to do a search for his old dance teacher from college -- the elegant tap artist Paul Draper, best known for his collaborations with mouth organist Larry Adler. Though we found nothing of Draper in performance (anyone out there have anything they'd like to post?), YouTube does feature clips of the dancer demonstrating and teaching his famous "Morton Gould's Tap Dance Concerto" to a young terp (www.youtube.com/watch?v=RbrK1j7nAmg).

The only terribly annoying aspect of the whole YouTube experience is the brevity of the descriptions that accompany the video postings. All too often you find yourself wishing for more information. Well, perhaps that's the idea -- tantalizing video teases that prompt you to go out and learn more about what you saw. So come on, don't be a snob. Get over to your computer and start plugging in names, titles, dance genres, or even general movement-related topics. And you too might learn something from YouTube.

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Links referenced within this article

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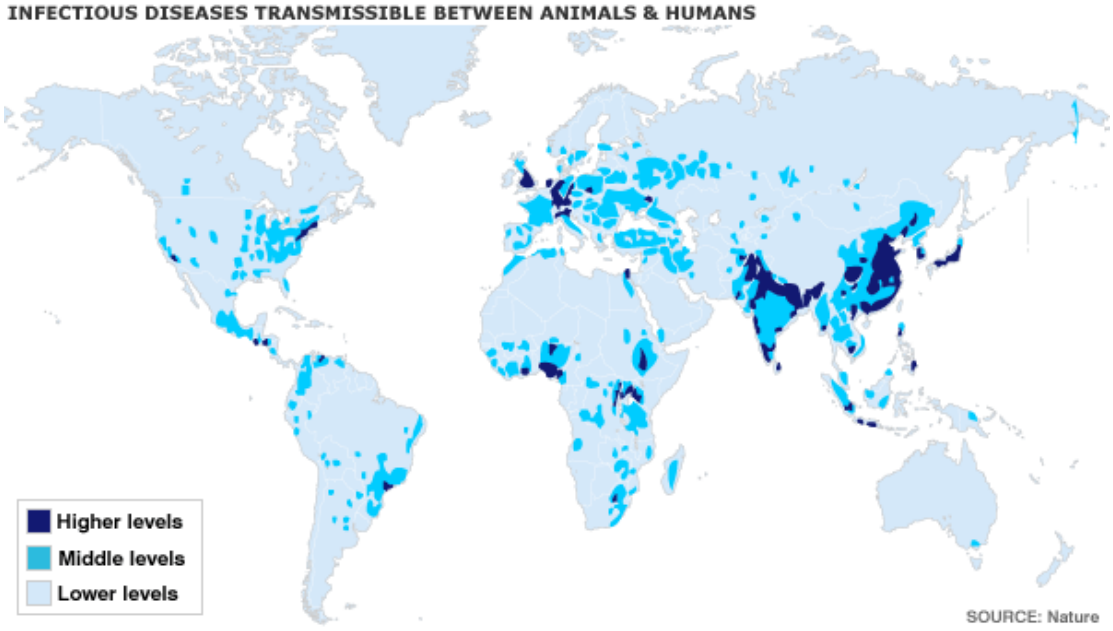
Map pinpoints disease 'hotspots'

By Mark Kinver
Science and nature reporter, BBC News



A detailed map highlighting the world's hotspots for emerging infectious diseases (EIDs) has been released.

It uses data spanning 65 years and shows the majority of these new diseases come from wildlife.

Scientists say conservation efforts that reduce conflicts between humans and animals could play a key role in limiting future outbreaks.

Writing in Nature, they said their map revealed that global anti-EID resources had been poorly allocated in the past.

Researchers from the Zoological Society of London (ZSL), and the US-based University of Georgia and Columbia University's Earth Institute analysed 335 emerging diseases from 1940 to 2004.

They then used computer models to see if the outbreaks correlated with human population density or changes, latitude, rainfall or wildlife biodiversity.

Finally, the data was plotted on to maps to reveal the "hotspots" around the globe.

Healthy environment

"Our analysis highlights the critical importance of conservation work," said co-author Dr Kate Jones, a research fellow for ZSL.

"Conserving areas rich in biodiversity from development may be an important means of preventing the emergence of new diseases."

The researchers found that 60% of EID events were caused by "non-human animal" sources.

They add that 71% of these outbreaks were "caused by pathogens with a wildlife source".

If we continue to ignore this important preventative measure, then human populations will continue to be at risk from pandemic diseases
Dr Peter Daszak,
Wildlife Trust

Among the examples listed by the team was the emergence of Nipah virus in Malaysia and the Sars outbreak in China.

Others included the H5N1 strain of bird flu, Ebola and West Nile virus.

The number of events that originated from wild animals had increased significantly over time, they warned.

"This supports the suggestion that zoonotic EIDs represents an increasing and very significant threat to global health," the paper's authors wrote.

They added that it also highlighted the need to understand the factors that lead to increased contact between wildlife and humans.

"We are crowding wildlife into ever smaller areas, and human population is increasing," explained Dr Marc Levy, a global change expert at Columbia University's Earth Institute.

"Where those two things meet, that is the recipe for something crossing over."

He added that the main sources were mammals that were most closely related to humans.

'**Missing the point**'

While some pathogens may be picked up while hunting or by accident, others - such as Nipah virus - are transmitted to humans from wild animals via livestock.

Because humans had not evolved resistance to these EIDS, the scientists said that the results could be "extraordinarily lethal".

The main hotspots were located in low latitude regions, like South Asia and South-East Asia, which were not the financial focus of global funds to prevent the spread of EIDs.

"The world's public health resources are misallocated," opined co-author Peter Daszak, executive director of the Consortium for Conservation Medicine at the US-based Wildlife Trust.

"Most are focused on richer countries that can afford surveillance, but most of the hotspots are in developing countries.

"If you look at the high-impact diseases of the future, we're missing the point."

However, Dr Dazak said that the maps were the first to offer a prediction of where the next new disease could emerge.

His colleague, Dr John Gittleman from the University of Georgia's Odum School of Ecology, described the data-set as a "seminal moment in how we study emerging diseases".

"Our study has shown that bringing ecological sciences and public health together can advance the field in a dramatic ways," he observed.

The researchers said that the priority should be to set up "smart surveillance" measures in the hotspots identified on the map.

Dr Daszak explained that logistically straightforward bio-security measures, such as screening people who come into contact with wild birds and mammals in the hotspot areas, could halt the "next Aids or Sars before it happened".

"It simply follows the old adage that prevention is better, and cheaper, than finding a cure.

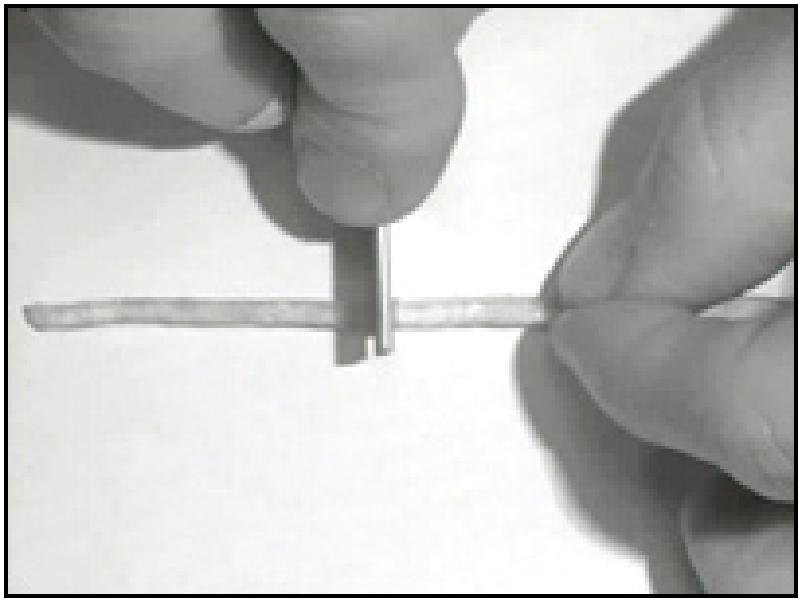
"If we continue to ignore this important preventative measure, then human populations will continue to be at risk from pandemic diseases," Dr Daszak warned.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7252923.stm

Published: 2008/02/20 21:38:12 GMT

Self-healing rubber bounces back

By Roland Pease
BBC Radio Science Unit



A material that is able to self-repair even when it is sliced in two has been invented by French researchers.

The as-yet-unnamed material - a form of artificial rubber - is made from vegetable oil and a component of urine.

The substance, described in the journal Nature, produces surfaces when cut that retain a strong chemical attraction to each other.

Pieces of the material join together again as if never parted without the need for glue or a special treatment.

This remarkable property comes from careful engineering of the molecules in the material.

The French researchers are already making kilogramme quantities in their Paris laboratories and say the process is almost completely green, and could be completely so with a few adjustments.

'Tiny hands'

The secret of the substance lies in how the molecules are held together.

A piece of normal rubber, says Dr Ludwik Leibler, who headed the research, is actually a single molecule with billion upon billions of smaller units chemically welded together to form a giant tangled network.

> **Children are always breaking their toys. Wouldn't it be nice if you could put them back together so easily?**
> Ludwik Leibler

The elasticity comes from the fact that the strands within the network are buckled like a concertina: pull on them and they straighten and elongate; let go and the buckles reappear.

But break a rubber (or most other solids), and the chemical welds - known as covalent bonds - are also broken.

These cannot be remade. Nor can a piece of rubber be remoulded or reshaped.

"We wanted to see if we could make a rubber-like material using small molecules," Dr Leibler of the Industrial Physics and Chemistry Higher Educational Institution (ESPCI) in Paris told the BBC's Science In Action programme.

The trick was to replace the covalent bonds in rubber with weaker connections known as hydrogen bonds.

These are like hands on neighbouring molecules that can clasp together, but let go when broken.

Dr Leibler quickly realised that this meant not only that the new rubber could be recycled and remoulded many times over, but that if separated by a cut or break, the chemical hands at the fresh surfaces would still be waving about ready to bind again.

Child's play

François Tournilhac, who runs Dr Leibler's laboratories, demonstrated the healing to me.

Using a razor blade he severed a thin strand of the yellowish material (the colour of corn oil), showed me the clean square faces, and then pressed them together.

Almost immediately, the grip was strong enough for him to hold the sample just at one end.

Within an hour the bonds had rebuilt themselves so thoroughly that it was possible to stretch the strand to twice its length without any sign of weakness where the cut had been made.

One obvious use, says Dr Leibler, is for self-healing seals.

Puncture a seal in a compression joint with a nail, and the hole would automatically repair itself.

He also has more playful suggestions.

"Why not use it to make children's toys? Children are always breaking their toys. Wouldn't it be nice if you could put them back together so easily?"

The material was developed with the support of the French company Arkema, which is already investigating whether it can be turned into a commercial product.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7254939.stm

Published: 2008/02/20 19:16:41 GMT

Salt 'could fuel child obesity'
Salt-rich diets could be the key to why some children battle with obesity, University of London researchers say.

In a study of data on 1,600 children, they found that children eating a salty diet tended to drink more, including more fattening, sugary soft drinks.

They reported in journal Hypertension that halving the average daily salt intake of six grams a day could cut 250 calories a week from a child's diet.

They called for further work by the food industry on reducing salt content.

> **This is evidence of another, hidden way in which eating too much salt may harm the health of children**
> Professor Graham McGregor
> St George's University of London

One in five children in the UK is overweight and there are fears that this will contribute to a rising trend in adult obesity, heart disease and stroke in years to come.

Eating products high in salt tends to make people thirsty and it is known that in adults, a salt-laden diet tends to increase the amount of sugary soft drinks consumed.

First in children

This is the first study to see if the same effect was found in children.

The team from St George's, University of London, looked at data from the National Diet and Nutrition Survey, conducted in 1997.

They used a sample of 1,600 four to 18-year-olds who had all had their salt and fluid intake measured precisely.

They found that children eating a lower-salt diet drank less fluid and estimated that one gram of salt cut from a daily diet would reduce fluid intake by 100 grams per day.

Approximately a quarter of those 100 grams would be sugary soft drinks, they predicted.

The researchers estimated that if children cut their salt intake by half - an average reduction of three grams a day - there would be a decrease of approximately two sugar-sweetened soft drinks per week per child.

That, in turn, would decrease each child's calorie intake by almost 250 calories per week.

> **When children regularly swill down salty foods with sugary, calorie-laden soft drinks, it can mean double trouble for their future heart health**
> British Heart Foundation

They urged parents to check the salt content of their children's meals and manufacturers to find ways to reduce this content.

They said reductions in the salt content of 10% or 20% cannot be detected by human salt taste receptors and do not cause any "technological or safety problems".

Professor Graham McGregor, one of the paper's authors and the chairman of Consensus Action on Salt and Health, said that while some manufacturers had acted to reduce salt levels in bread and cereals - the main sources of salt for children - there was still plenty left for the industry to do.

"Unfortunately some food specifically targeted at children has to be laced with salt otherwise it would be inedible, because it is made from mechanically-recovered meat," he said.

"The salt levels in some of these products have been brought virtually up to the level of sea water.

"This is evidence of another, hidden way in which eating too much salt may harm the health of children and the industry needs to do a lot more."

Label call

Dr Myron Weinberger, from the Indiana University Medical Center, wrote that reductions in salt and soft drink consumption in children, coupled with an increase in physical activity, could help reduce the "scourge of cardiovascular disease" in western society.

A spokesman for the British Heart Foundation said that better food labelling would help parents to choose healthier foods for their families.

"When children regularly swill down salty foods with sugary, calorie-laden soft drinks, it can mean double trouble for their future heart health.

"This report is yet more proof that children must be supported to make healthier food choices to avoid becoming obese or increasing their blood pressure."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7254589.stm

Published: 2008/02/21 00:59:11 GMT

3 Coins Might Short Out This Fountain

By CAROL VOGEL

As a massive crane stacked units of curved steel embedded with thousands of light bulbs on a vast circular base on Sunday, passers-by couldn't help but wonder what was rising on the exact spot where the fabled tree stands every Christmas in Rockefeller Center.

"I thought it was the ball they drop in Times Square," said Arthur Aery, an accountant from Guildford, Conn. Others thought the crew was assembling some kind of carnival ride.

Chilly though the day was, crowds gathered steadily around the site. In the middle of it all was a slight dark-haired couple, clad in blue jeans, sneakers and wool caps. Each chatted amiably with onlookers, explaining in broad English accents that this was the makings of a 61,000-pound fountain fashioned from steel, neon tubing and 3,390 LED bulbs. When the installation is completed for its official opening next Wednesday, it will soar 35 feet in the air.

The two, the London artists Tim Noble, 42, and Sue Webster, 40, seemed even more excited than the crowd as they watched two years of work and a decade-long dream finally take shape. "The piece is really about danger," Ms. Webster warned impishly. "Everyone knows you shouldn't mix electricity with water."

Yet the water will be only a simulation. Turned on each day from 6 a.m. to midnight through April 4, the fountain's blue neon tubing and LED lights will create the illusion of cascading water.

Sunday was Day 3 of a weeklong installation involving a team of experts from Aachen, Germany, who have spent over a year fabricating "Electric Fountain" from a rough sketch provided by Mr. Noble and Ms. Webster. Overseeing the team were Yvonne Force Villareal and Doreen Remen, who run the Art Production Fund, a nonprofit organization that presents public art around the city. Also on hand were two members of a production team from Tishman Speyer Properties, an owner of Rockefeller Center.

"It's starting to look like something you'd see outside the Bellagio Hotel in Las Vegas," Ms. Webster said as the fabricators put the pieces into place.

Ms. Webster and Mr. Noble, who have lived and worked together since they were art students in the late 1980s, delight in such kitsch. Over the years they have gained an international following for creating illuminated signs in shapes like hearts and dollar signs or with words like "Forever" and "Yes." They are

also known for creating assemblages and kinetic sculptural installations from found objects, often projecting silhouettes of themselves on a nearby wall. ("Polymorphous Preverse," a kinetic sculptural installation that was shown last fall at the Freud Museum in London, will go on view on Feb. 29 at Deitch Projects in SoHo.)

The couple produce much of their work in their studio, on the first floor of a converted warehouse in the East End of London, where they also live. The building resembles a bunker, with rough cement cladding and mirrored windows, the creation of a friend, the London architect David Adjaye, who renovated the structure for them.

Relaxing two weeks ago in their London living room, an airy space with a coffee table by their neighbor Rachel Whiteread, a carpet by Gary Hume and a white ceramic flowerless puppy by Jeff Koons atop the dining room table, the couple talked about the evolution of "Electric Fountain" from a drawing on a scrap of paper to a $1 million project that is likely to be seen by some 250,000 people a day.

"It's been a whole learning process," Mr. Noble said.

Three years ago the couple mentioned to Mark Fletcher, an art adviser who has long championed their work and is a board member of the Art Production Fund, that they wanted to do a project at Rockefeller Center. What they first had in mind was a giant three-dimensional version of "Toxic Schizophrenia," a 1997 work of theirs consisting of a giant red illuminated heart dripping blood, with a jeweled dagger plunged into its center.

Rockefeller Center rejected the proposal. "New York wasn't ready for blood after 9/11," Ms. Webster explained. "We were really disappointed."

So the couple shifted to more comfortable territory: a fountain.

In 1996 they created a two-dimensional fountain that was essentially a light sculpture. Ms. Webster said she and Mr. Noble had been obsessed with lights since their art school days in Nottingham and visited the fairgrounds by night. "The fair came to town once a year during the dull winter months, and all the students would hang out there," she said. "We became especially fascinated with the light bulbs that were used, ones that would chase each other in a sequential line."

Some Gypsies who worked at the fair told the couple where they could purchase such lights, and Mr. Noble and Ms. Webster began incorporating them in their art.

On visits to New York the couple were also captivated by the 60-foot-high red neon Pepsi Cola sign whose curlicues have floated over Long Island City, Queens, for more than 60 years.

Once their proposal for a giant fountain was approved, the couple began reading up on the art and architecture of Rockefeller Center. “In the foyer of Radio City there is this amazing mural that depicts the fountain of youth, so fountains are in its bones,” Mr. Noble said. “The Art of Rockefeller Center,” a 2005 book by Christine Roussel, convinced them they had hit on the perfect form, he added, quoting from one passage: “The Rockefellers knew the future would concentrate on the electric arts of sound and light.”

A temporary sculpture can be more expensive to construct than a permanent one, the couple said, because it must be conceived as a modular jigsaw puzzle that can easily be taken apart, reassembled and shipped safely.

The $1 million cost of the project is being underwritten by Lexus, the car maker, and Jeffrey Deitch, the couple’s New York dealer. By the time the “Electric Fountain” is dismantled on April 4, Ms. Webster and Mr. Noble hope it will have found a permanent home.

The artists were also adamant that it be energy efficient. They spent months researching light bulbs and in the end had them all custom made in China. “These LED bulbs will draw less juice than the Rockefeller Center Christmas tree,” Ms. Webster said. (Each of the LED bulbs uses about 70 percent less energy than a tungsten bulb does.)

Just as tourists throw money into the Trevi Fountain in the hope that they will fulfill the age-old legend and return to Rome one day, Ms. Webster said she wants people to throw money into the “Electric Fountain.” “So many people have been sending us text messages,” she said. “Telling us they want to come to New York to bathe in the ‘Electric Fountain’ of love.”

http://www.nytimes.com/2008/02/21/arts/design/21foun.html?_r=1&th&emc=th&oref=slogin

Most Detailed Global Study Of Genetic Variation Completed

A schematic of worldwide human genetic variation, with colors representing different genetic types. The figure illustrates the great amount of genetic variation in Africa. (Credit: Illustration by Martin Soave/University of Michigan) ScienceDaily (Feb. 21, 2008) — University of Michigan scientists and their colleagues at the National Institute on Aging have produced the largest and most detailed worldwide study of human genetic variation, a treasure trove offering new insights into early migrations out of Africa and across the globe.

Like astronomers who build ever-larger telescopes to peer deeper into space, population geneticists like U-M's Noah Rosenberg are using the latest genetic tools to probe DNA molecules in unprecedented detail, uncovering new clues to humanity's origins. The latest study characterizes more than 500,000 DNA markers in the human genome and examines variations across 29 populations on five continents.

"Our study is one of the first in a new wave of extremely high-resolution genome scans of population genetic variation," said Rosenberg, an assistant research professor at U-M's Life Sciences Institute and co-senior author of the study, to be published in the Feb. 21 edition of Nature.

"Now that we have the technology to look at thousands, or even hundreds of thousands, of genetic markers, we can infer human population relationships and ancient migrations at a finer level of resolution than has previously been possible."

The new study, led by Rosenberg and National Institute on Aging colleague Andrew Singleton, produced genetic data nearly 100 times more detailed than previous worldwide assessments of human populations.

It shows that: • A recently discovered type of human genetic variation, known as a copy-number variant or CNV, is a reliable addition to the toolkit of population geneticists and should speed the discovery of disease-related genes. Rosenberg and his colleagues discovered 507 previously unknown CNVs, which are large chunks of DNA—up to 1,000,000 consecutive "letters" of the genetic alphabet—that are either repeated or deleted entirely from a person's genome. Various diseases can be triggered by an abnormal gain or loss in the number of gene copies.

• It's sometimes possible to trace a person's ancestry to an individual population within a geographic region. While previous studies have found that broad-scale geographic ancestry could be successfully traced, the new results indicate "it's becoming increasingly possible to use genomics to refine the geographic position of an individual's ancestors with more and more precision," Rosenberg said.

• Human genetic diversity decreases as distance from Africa—the cradle of humanity—increases. People of African descent are more genetically diverse than Middle Easterners, who are more diverse than Asians and Europeans. Native Americans possess the least-diverse genomes. As a result, searching for disease-causing genes should require the fewest number of genetic markers among Native Americans and the greatest number of markers among Africans.

The results are being made available on publicly shared databases. "I hope the study will be an invaluable resource for understanding genomic variability and investigating genetic association with disease," said the NIA's Singleton. The researchers analyzed DNA from 485 people. They examined three types of genetic variation: single-nucleotide polymorphisms, or SNPs; haplotypes; and CNVs.

If the human genome is viewed as a 3-billion-letter book of life, then SNPs represent single-letter spelling changes, haplotype variations equate to word changes, and CNVs are wholesale deletions or duplications of full pages. The patterns revealed by the new study support the idea that humans originated in Africa, then spread into the Middle East, followed by Europe and Asia, the Pacific Islands, and finally to the Americas.

The results also bolster the notion of "serial founder effects," meaning that as people began migrating eastward from East Africa about 100,000 years ago, each successive wave of migrants carried a subset of the genetic variation held by previous groups. "Diversity has been eroded through the migration process," Rosenberg said.

In addition to his position at the Life Sciences Institute, Rosenberg is an assistant professor of human genetics at the Medical School; an assistant professor of biostatistics at the School of Public Health; an assistant professor of ecology and evolutionary biology at the College of Literature, Science, and the Arts; and an assistant research professor of bioinformatics at the Medical School's Center for Computational Medicine and Biology. "This data set is so rich. It provides a much more comprehensive, cross-sectional snapshot of the human genome than previous studies," said Paul Scheet, a post-doctoral researcher in the U-M Department of Biostatistics and one of the lead authors.

"The next step for these studies is to sequence whole genomes," said Mattias Jakobsson, a post-doctoral researcher at the U-M Center for Computational Medicine and Biology and another lead author. "You would take 500 individuals, and you would just completely sequence everything, and then you'd have almost every important variant that's out there." The work was supported in part by National Institutes of Health grants, the U-M Center for Genetics in Health and Medicine, the Alfred P. Sloan Foundation, the Burroughs Wellcome Fund, the National Center for Minority Health and Health Disparities, and the Intramural Program of the National Institute on Aging.

Adapted from materials provided by University of Michigan.

http://www.sciencedaily.com:80/releases/2008/02/080220161704.htm

Spirits That Fly High While Rooted in Tradition

By JENNIFER DUNNING

There is a photograph in the program for the Nrityagram Dance Ensemble, which opened at the Joyce Theater on Tuesday night, that says a great deal about this unusual Indian dance troupe.

In the picture, four women soar in midair as modern dancers might do. Their bodies, dressed in traditional costumes, have assumed the S shape of Indian classical dance. Their arms curve and stretch like those of Indian traditionalists. But that jump, with feet tucked under, has a joyous abandon that signals the kind of pure emotion and physicality, stripped of form and narrative, found more often in Western dance.

Spirituality was at the heart of Nrityagram's six dances. The pieces, choreographed by Surupa Sen, the company's artistic director, are rooted in the ancient school of Odissi. The form is known for its lyricism and an abstraction that makes it somewhat more adaptable to Western dance.

The Joyce program does include a narrative solo, "Khandita (love betrayed)," a tour de force of performing for Ms. Sen that tells the story of the fickle Krishna's betrayal of Radha, who waits for the god all night and then becomes enraged when she realizes he has been with another woman. And the company, founded by the practical visionary Protima Gauri and based in Kamataka, India, also presented a flowing introduction to Odissi in "Chhaya (image)."

But for the most part this was an evening of sumptuous and sensuous spirituality, most eloquently realized in "Vibhakta (the division)." Performed by Ms. Sen and Bijayini Satpathy, the duet evokes the oneness and duality of creation, specifically of the male and female principles. Program notes quote from an intense, poetic hymn, "Ardhanareshwara Stotra," in which male and female sing of each other's exquisite attributes.

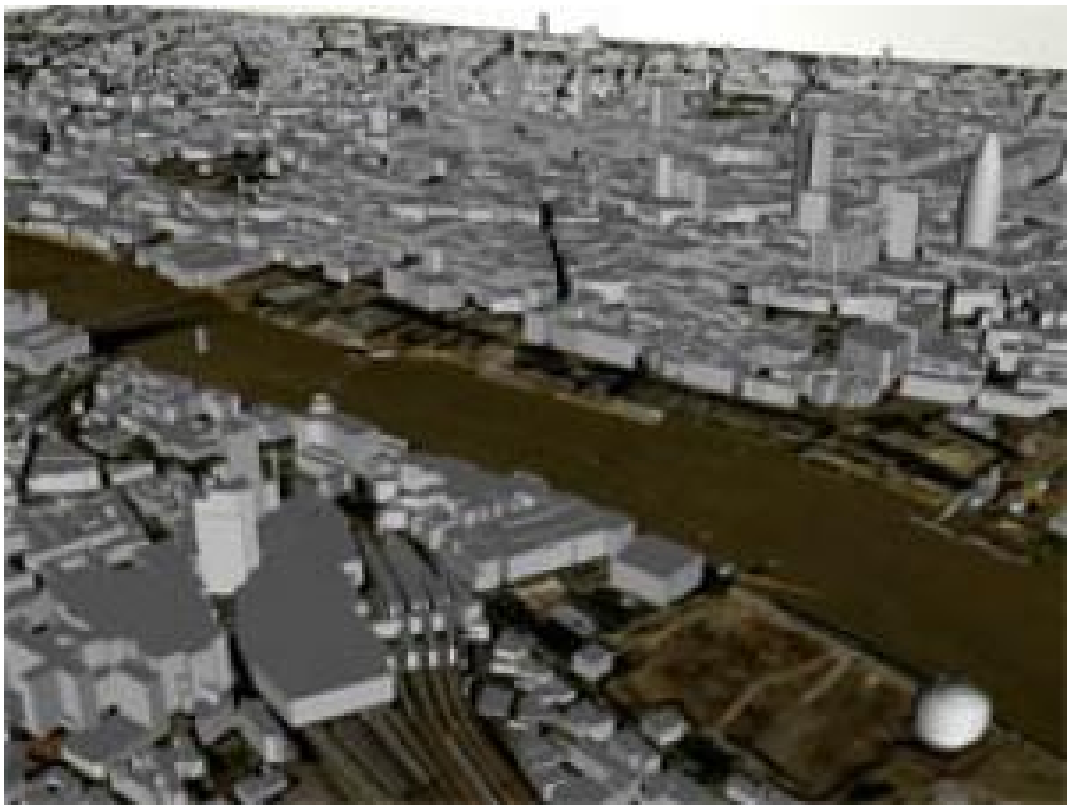
The duet reflects those glories in two women who often move as one, in dynamic parallel, and at several points one woman even seems to lean toward the other as she pulls away, though never very far. At another moment, one woman, seemingly portraying the male principle, moves forward assertively, only to slip into the arms of the woman, suddenly becoming an infant. But the dance has a crisp, almost playful quality at times, often as the performers' arms link and twine about one another, deft and subtle.

Several of the bigger jumps strike a slightly discordant note of intruding technique. And there are a few comparatively crude effects in "Aarati (offering)," a closing dance described as a salutation to the presiding deities of Odissi dance. At one point the dancers (Ms. Satpathy, Pavithra Reddy, Rasmi Raj and Manasi Tripathy) form a straight line from which their arms snake out. The candle dancing at the end also feels heavy-handed. But these moments underscore the luminous delicacy for which Nrityagram has become known around the world.

The Nrityagram Dance Ensemble performs through Sunday at the Joyce Theater, 175 Eighth Avenue, at 19th Street, Chelsea; (212) 242-0800, joyce.org.

http://www.nytimes.com/pages/arts/dance/index.html?adxnnl=1&adxnnlx=1203613774-EWQPpKg+q9dEcwKwZUbYjA

Theory Of Evolution Of Cities Links Science, Fractal Geometry



The Virtual London Model: Showing the distribution of buildings in the central business district from which the density, compactness, energy emissions can be measured for exploring urban sustainability. (Credit: Image courtesy of University College London)

ScienceDaily (Feb. 21, 2008) — A paper by Professor Michael Batty (UCL CASA) published in 'Science' and the video that accompanies this highlights a new way of looking at cities that has emerged during the last 20 years that could revolutionise planning and ultimately benefit city dwellers.

'The Size, Scale and Shape of Cities' advocates an integrated approach to the theory of how cities evolve by linking urban economics and transportation behaviour with developments in network science, allometric growth and fractal geometry.

Professor Batty argues that planning's reliance on the imposition of idealised geometric plans upon cities is rooted in the nineteenth century attitude which viewed cities as chaotic, sprawling and dirty. Instead, he reports research that suggests beneath the apparent chaos, there is a strong order: "Cities are the example par excellence of complex systems: emergent, far from equilibrium, requiring enormous energies to maintain themselves, displaying patterns of inequality spawned through agglomeration and intense competition for space, and saturated flow systems that use capacity in what appear to be barely sustainable but paradoxically resilient networks."

These geometrical plans, such as Ebenezer Howard's 'Garden City of Tomorrow', propose an ideal city size and structure, which according to Professor Batty, ignores the way in which real cities develop: "Idealised cities are simply too naïve with respect to the workings of the development process, and competition for the use of space that characterises the contemporary city and the degree of diversity and heterogeneity that the most vibrant cities manifest."

Instead, according to Professor Batty, cities grow through allometry – growth at different rates – resulting in a change of proportion – and this changes the energy balance used to sustain them. "Network science provides a way of linking size to the network forms that enable cities to function in different ways. The

impacts of climate change, the quest for better performance, and the seemingly intractable problems of ethnic segregation and deprivation due to failures in job and housing markets can all be informed by a science that links size to scale and shape through information and material and social networks that constitute the essential functioning of cities."

While Professor Batty is quick to point out that the method of looking at how cities function as complex systems is still in its infancy, he is confident that the past and continuing practice of imposing an idealised geometric system on them won't resolve current urban ills. "This new science makes us much more aware of the limits of planning. It is likely to lead to a view that as we learn more about the functioning of such complex systems, we will interfere less but in more appropriate ways."

Adapted from materials provided by University College London.

http://www.sciencedaily.com:80/releases/2008/02/080215211940.htm

Human Culture Subject To Natural Selection, Study Shows

Polynesian outrigger canoe. The Stanford team studied reports of canoe designs from 11 Oceanic island cultures. They evaluated features that could contribute to the seaworthiness of the canoes and thus have a bearing on fishing success or survival during migration or warfare. (Credit: iStockphoto/Flemming Mahler)

ScienceDaily (Feb. 20, 2008) — The process of natural selection can act on human culture as well as on genes, a new study finds. Scientists at Stanford University have shown for the first time that cultural traits affecting survival and reproduction evolve at a different rate than other cultural attributes. Speeded or slowed rates of evolution typically indicate the action of natural selection in analyses of the human genome.

This study of cultural evolution compares the rates of change for structural and decorative Polynesian canoe-design traits.

"Biological evolution of inherited traits is the essential organizing principle of biology, but does evolution play a corresponding role in human culture?" said Jared Diamond, a professor of geography at the University of California-Los Angeles and author of Guns, Germs and Steel. "This paper makes a decisive advance in this controversial field."

The Stanford team studied reports of canoe designs from 11 Oceanic island cultures. They evaluated 96 functional features (such as how the hull was constructed or the way outriggers were attached) that could contribute to the seaworthiness of the canoes and thus have a bearing on fishing success or survival during migration or warfare.

They also evaluated 38 decorative or symbolic features (such as the types of carved or painted designs). They analyzed mathematically the rates of change for the two groups of canoe design traits from island group to island group. Statistical test results showed clearly that the functional canoe design elements changed more slowly over time, indicating that natural selection could be weeding out inferior new designs. This cultural analysis is similar to analyses of the human genome that have been successful in finding which genes are under selection.

The field of cultural evolution is controversial because not all historians, social scientists or even biologists agree that cultural change can be understood in an evolutionary context. Some say that human beliefs and behaviors are too unpredictable.

But Nina Jablonski, chair of the Anthropology Department at Pennsylvania State University, said she is sold on the research. "This paper is revolutionary in its approach … one of the most significant papers to be written in anthropology in the last 20 years," she said.

Authors of the study said their results speak directly to urgent social and environmental problems. "People studying climate change, population growth, poverty, racism and the threat of plagues all know what the problems are and what we should be doing to solve them," said Paul Ehrlich, the Bing Professor of Population Studies at Stanford.

Ehrlich, author of The Population Bomb and other books on dilemmas facing contemporary human society, said he does not understand why more effort is not going into urgently needed solutions. "What we don't know, and need to learn, is how cultures change and how we can ethically influence that process," he said.

Deborah S. Rogers, a research fellow at Stanford, said their findings demonstrate that "some cultural choices work while others clearly do not."

"Unfortunately, people have learned how to avoid natural selection in the short term through unsustainable approaches such as inequity and excess consumption. But this is not going to work in the long term," she said. "We need to begin aligning our culture with the powerful forces of nature and natural selection instead of against them."

Examples of cultural approaches that are putting humans at risk include "everything from the economic incentives, industrial technologies and growth mentality that cause climate change, pollution and loss of biodiversity, to the religious polarization and political ideologies that generate devastating conflict around the globe," Rogers said. "If the leadership necessary to undertake critically needed cultural evolution in these areas can't be found, our civilization may find itself weeded out by natural selection, just like a bad canoe design."

This research is scheduled to appear Feb. 19, in the online Proceedings of the National Academy of Sciences. Deborah S. Rogers and Paul R. Ehrlich are affiliated with the Center for Conservation Biology.

Adapted from materials provided by Stanford University.

http://www.sciencedaily.com:80/releases/2008/02/080216175953.htm

Wizkid Robot Hones In On Human Faces And Encourages Interaction

Meet Wizkid: part computer, part robot, a Swiss kid who's changing our concept of how people interact with machines. You can select interactive elements with a wave of your hands. (Credit: Image courtesy of Ecole Polytechnique Fédérale de Lausanne)

ScienceDaily (Feb. 20, 2008) — There's a kid waiting to meet you at The Museum of Modern Art in New York. Like any kid, it will amuse you, it will ask you lots of questions, and it might even bother you a little bit. But unlike most kids, it doesn't walk or talk, and it pays perfect attention. Meet Wizkid: part computer, part robot, a Swiss kid who's changing our concept of how people interact with machines.

Wizkid is part of MoMA's Design and the Elastic Mind exhibit, running from February 24 to May 12, 2008. This unusual device is the result of a collaboration between an engineer, Fréderic Kaplan and an industrial designer, Martino d'Esposito. Kaplan, a researcher at EPFL (Ecole Polytechnique Federale de Lausanne), worked ten years for Sony, creating "brains" for entertainment robots. D'Esposito, who teaches at ECAL (The University of Art and Design Lausanne), designs objects and furniture for several companies including Ligne Roset and Cinna. Their collaboration was supported by the new EPFL+ECAL Lab, a joint initiative of the two Lausanne-based institutions that aims to merge engineering, design and architecture in new and innovative ways.

Wizkid looks like a computer with a neck. But there the similarities with the familiar personal computer end. Wizkid isn't static. The screen on the mobile neck moves about like a head, and it's trained to hone in on human faces. Once it sees you, Wizkid focuses on you and follows your movement. Unlike a computer, which requires you to stop what you're doing and adapt your behavior and social interactions in order to use it, Wizkid blends into human space. There's no mouse and no keyboard. You don't touch anything. There's no language getting in the way.

On Wizkid's screen you see yourself surrounded by a "halo" of interactive elements that you can simply select by waving your hands. If you move away or to one side, Wizkid adapts itself to you, not the other way around. If you're with a friend, Wizkid finds and tracks both of you and tries to figure out your relationship, expressing surprise, confusion or enjoyment when it gets your response.

Wizkid's inventors see their creation as playing a new and important role in the transitional world we currently inhabit. "Wizkid gets us AFK -- away from keyboard -- and back into the physical world, " explains Kaplan. "Unlike a personal computer, it doesn't force the human to accommodate, and it's fundamentally social and multi-user."

Kaplan isn't suggesting that Wizkid will replace the language-driven interfaces of ordinary computers. But he does believe that there are many areas in which Wizkid's augmented reality could ease and enhance the human experience. Hold up your favorite CD cover and Wizkid will start the stereo. Play novel kinds of games. Browse products in a store or information in a museum exhibit without having to touch a screen. In the office, Wizkid adds a new dimension to conferences, paying attention to who is speaking (and who is not).

Unlike a real kid, whose learning curve can be frustratingly hard to influence, Wizkid learns as much as you want it to about you and your world, and interacts with you at a level that you define. Creature of habit" Wizkid will keep track of your preferences, and anticipate some light jazz when you walk in the door. Want to use this device simply as a tool" Adjust a slider on its side and Wizkid will follow you without making any suggestions.

At the MoMA exhibit, Wizkid will interact with visitors; ask (nonverbal) questions about relationships; and use its novel "body language" to express interest, confusion, and pleasure. If you go out of range, and then come back, Wizkid might just remember you and try to continue the conversation. It's different and slightly unsettling at first, because we're so used to adapting ourselves to the restricted physical scope of computers and to interacting with them through language and touch. So stretch your mind, and let this new kid on the block surprise you!

Adapted from materials provided by Ecole Polytechnique Fédérale de Lausanne.

http://www.sciencedaily.com/releases/2008/02/080219093019.htm

Melting Snow Provides Clues For Acidification

Sulfur and nitrogen accumulate in the snowpack and are released to groundwater and streams over a short period of time during spring snowmelt. These acidic agents can threaten the health of acid-sensitive plants and animals. (Credit: iStockphoto/Linda Iler)

ScienceDaily (Feb. 20, 2008) — In forests of the northeastern United States, sulfate and nitrate are the dominant dissolved forms of sulfur and nitrogen in precipitation. In winter, these acidic agents accumulate in the snowpack and are released to groundwater and streams over a short period of time during spring snowmelt. This pulsed release of sulfate and nitrate in snowmelt can cause episodic acidification in poorly buffered soils, ultimately threatening the health of acid-sensitive biota.

There have been recent studies showing that biological cycling of sulfur and nitrogen persists in cold weather, despite below freezing air temperatures. Much of this activity occurs in soils, where an insulating snow layer keeps soil temperatures warm enough for a range of biological processes. Despite the growing awareness of winter's role in sulfur and nitrogen cycling, many questions remain unanswered. In particular, there is much uncertainty about how sulfate and nitrate are retained or transformed in forest soils during cold weather.

Scientists from the U.S. Forest Service, SUNY-ESF, University of Calgary, and Cary Institute of Ecosystem Studies tracked the movement of sulfate and nitrate deposited in snow. A solution containing isotopically enriched sulfate and nitrate was sprayed on the surface of the snowpack during mid winter. The isotopic values of the labeled sulfate and nitrate were well above background levels and served as a tracer to follow the movement and transformation of these compounds in the ecosystem.

The researchers found that almost all of the labeled sulfate and nitrate deposited on the surface of the snow was recovered in snowmelt water, indicating that there were no significant transformations of sulfate and nitrate in the snowpack. In contrast, about half of the sulfate and nitrate was retained or transformed in the forest floor, suggesting that organic soils are a sink for these compounds during winter. For sulfate, the amount retained or transformed in the forest floor was nearly equal to the amount released, resulting in no significant net gains or losses.

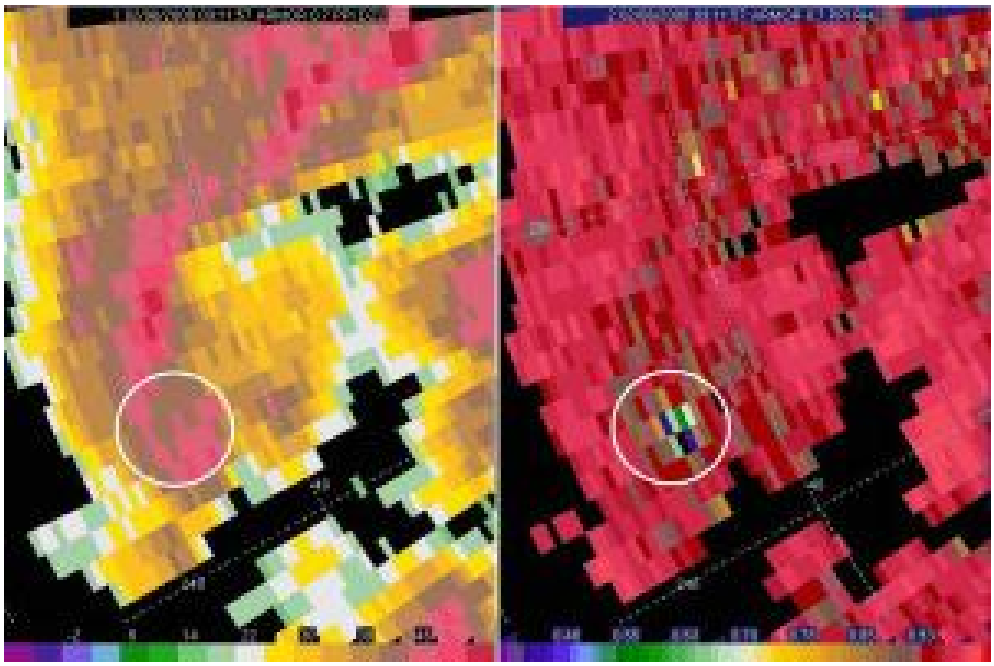
A significant amount of ammonium was produced in the forest floor indicating that N mineralization can be important, even when soil temperatures are near freezing. By contrast, net nitrification rates were very low during winter. Tracer results indicated that microbes did not immobilize snowpack nitrate and that other processes such as plant uptake, denitrification, and abiotic nitrate retention were probably more important factors affecting nitrate during snowmelt. More information on controls on nitrogen and sulfur cycling during winter is critical to our understanding of long-term trends and will help us predict how forest ecosystems will respond to future disturbances and global change processes.

This research is published In the November-December 2007 issue of the Soil Science Society of America Journal. It is available for no charge until March 15. View the abstract at:
http://soil.scijournals.org/cgi/content/abstract/71/6/1934

Adapted from materials provided by Soil Science Society of America.

http://www.sciencedaily.com:80/releases/2008/02/080215124502.htm

Tornado Images May Lead To Precise Storm Warnings



Radar images from the morning of Feb. 6 show the mesocyclone forming over Lawrence County, Ala., left, and the unexpected indication of debris jetted as much as two miles high, right. (Credit: Image courtesy of University of Alabama Huntsville)

ScienceDaily (Feb. 20, 2008) — An unexpected radar image of airborne debris from the Feb. 6 tornado that killed four people in Lawrence County, Ala., might help scientists develop better tools for warning the public when and where strong tornadoes are on the ground.

Scientists in the Earth System Science Center at The University of Alabama in Huntsville (UAHuntsville) are studying radar data from the early morning tornado to see if the radar signature from the debris is so distinctive that computers can be programmed to instantly recognize it, so more timely and precise warnings might be issued.

"The real advantage would be the precision," said Dr. Walt Petersen, the UAH research scientist leading the radar data analysis. "These events are usually going to be associated with large scale mesocyclones, so tornado warnings would probably already have been issued. But those large scale rotation features can cover several miles.

"With this debris signal, we might be able to pinpoint the precise spot where a tornado is on the ground. It would be great to be able to say, 'The tornado is right there, at that town.' If you could automate a system to do that, it would be quite handy and useful."

Two of Petersen's UAH graduate students, Chris Schultz and Elise Johnson, used laptop computers to monitor the radar that morning from the safety of their temporary operations center -- the bathroom in Schultz' apartment, "in case we had to dive into the bathtub."

Later Schultz suggested to Petersen that there might be a debris signature associated with the Alabama storm.

This was the first time a significant tornado has hit within range of the advanced radar unit at the Huntsville International Airport since it was put in service in late 2004. Other storm-related debris sightings using similar radar technology at the National Severe Storms Laboratory in Norman Oklahoma have been rare, so every sighting adds substantially to the paltry information previously available.

The Advanced Radar for Meteorological and Operational Research (ARMOR) was developed jointly, with UAHuntsville and a Huntsville television station collaborating to upgrade a decommissioned former National Weather Service Doppler radar unit.

ARMOR is a dual polarimetric radar, while most other weather radar units are single polarity. Dual polarization gives ARMOR the ability to gather more data about the size and shape of particles in the air. Initially it was thought the dual polarization capability would help scientists learn more about severe storms, identify hail or snow, and better estimate rainfall.

The ability to recognize flying debris wasn't something scientists really expected.

"This was totally serendipitous," said Dr. Larry Carey, an ESSC scientist working with Petersen. "Everything else we've done (with ARMOR) were things we pretty much expected. This wasn't really planned. It is just an added benefit of the technology."

If computers can be programmed to recognize debris in the radar data, that programming might be a standard feature when the National Weather Service upgrades its existing nationwide NEXRAD radar network to dual polarimetric capabilities beginning in 2009.

While the debris feature might not reduce the number of false tornado warnings, it could add a level of urgency and precision to warnings when tornadoes do occur, Petersen said.

ARMOR picked up the radar reflection of debris thrown as much as two miles into the air by the tornado. The funnel-shaped plume first shows up on the radar screen above the Pinhook community in Lawrence County, close to the time that the tornado was rated as very intense (EF-3 on the extended Fujita scale).

"There's nothing else we can come up with to explain this," Petersen said. "Things match up so well, this is not coincidence. We think our first impressions were correct, that this is indeed a debris signature."

In addition to improving warnings, the ARMOR data may provide other insights into how and why tornadoes form when and where they do. Preliminary radar data from the storm, for instance, shows an area of exceptionally heavy rain (at the rate of six to eight inches per hour) falling immediately behind where the tornado appeared.

The scientists wonder if vertical air movements associated with rainfall that heavy might contribute to shifting horizontal turbulence in the storm front into vertical rotation.

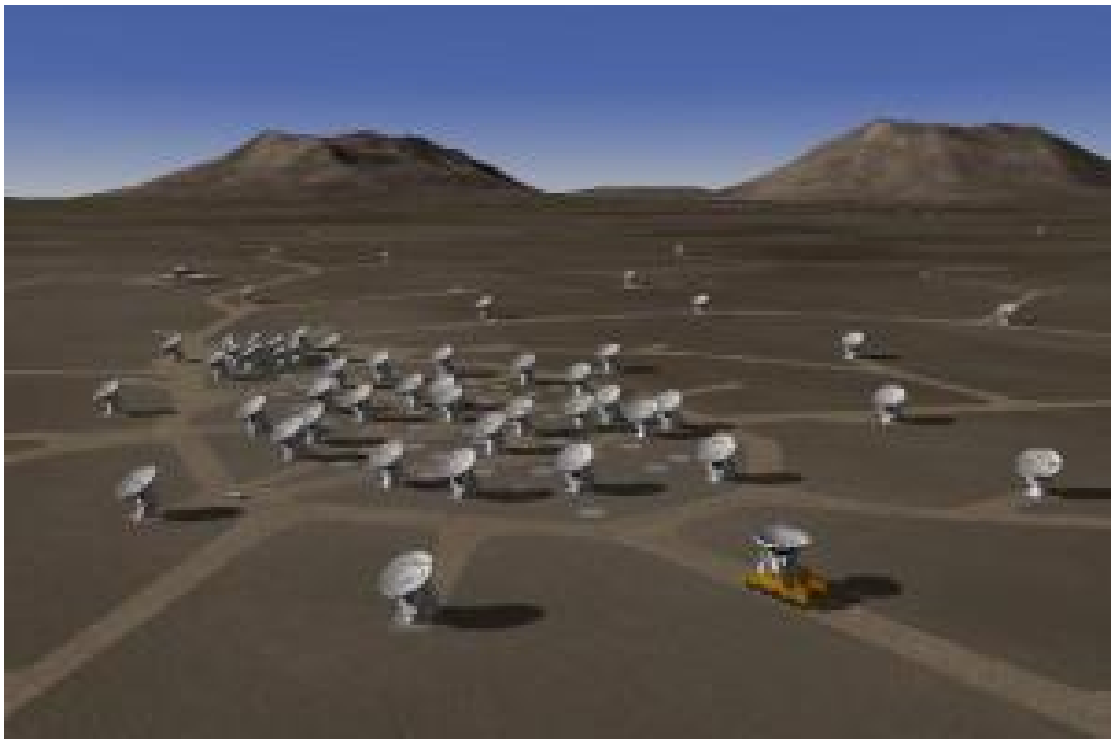
"Also, is it just coincidence that this tornado spun up as it came out of the Bankhead Forest over a slight down slope?" Carey asked. "There are so many factors involved - wind shear and rainfall and topography — it wouldn't surprise me if it takes a concurrence of all of them to spin up a significant tornado."

The data analysis and related work are supported by funding secured by U.S. Sen. Richard Shelby for the Tornado and Hurricane Observations and Research Center (THOR) test bed facility at UAHuntsville.

Adapted from materials provided by University of Alabama Huntsville.

http://www.sciencedaily.com:80/releases/2008/02/080217215726.htm

ALMA Telescope Will Open New Window On The Universe



Artist's Concept of Completed ALMA (Credit: ALMA/ESO/NRAO/NAOJ)

ScienceDaily (Feb. 20, 2008) — In the thin, dry air of northern Chile's Atacama Desert, at an altitude of 16,500 feet, an amazing new telescope system is taking shape, on schedule to provide the world's astronomers with unprecedented views of the origins of stars, galaxies, and planets. The Atacama Large Millimeter/submillimeter Array (ALMA) will open an entirely new "window" on the Universe, allowing scientists to unravel longstanding and important astronomical mysteries.

"Most of the photons in the Universe are in the wavelength range that ALMA will receive, and ALMA will give us our first high-resolution views at these wavelengths. This will be a tremendous advancement for astronomy and open one of our science's last frontiers," Anneila Sargent, a Caltech professor and ALMA Board member, told the American Association for the Advancement of Science at its meeting in Boston, Mass.

The millimeter and submillimeter wavelength range lies between what is traditionally considered radio waves and infrared waves. ALMA, a system using up to 66 high-precision dish antennas working together, will provide astronomers with dramatically greater sensitivity, the ability to detect faint objects, and resolving power, the ability to see fine detail, than has ever before been available in this range.

"This ambitious project is the product of an international collaboration that spans the globe," Sargent said. "ALMA truly will enable transformational science and providing this capability has required a massive, world-wide effort," she added.

The ALMA project is a partnership between Europe, Japan and North America in cooperation with the Republic of Chile. ALMA is funded in Europe by ESO, in Japan by the National Institutes of Natural Sciences in cooperation with the Academia Sinica in Taiwan and in North America by the U.S. National Science Foundation in cooperation with the National Research Council of Canada. ALMA construction and operations are led on behalf of Europe by ESO, on behalf of Japan by the National Astronomical Observatory of Japan and on behalf of North America by the National Radio Astronomy Observatory, which is managed by Associated Universities, Inc.

While scores of people are working at the ALMA site in Chile, more are in laboratories, test facilities, and factories around the world developing and producing equipment destined for ALMA. Antennas are coming from Europe, North America, and Japan. The giant transporter machines that will allow the antennas to be moved into multiple configurations have arrived in Chile from Germany. The prototype antennas and the prototype electronic equipment for ALMA have been tested at the site of the Very Large Array radio telescope in New Mexico. In Chile, buildings, roads and the complex infrastructure required to support ALMA operations all are coming together.

Groundbreaking for ALMA was held in 2003, and the project is scheduled for completion in 2012.

Astronomers expect ALMA to make extremely important contributions in a a variety of scientific specialties. The new telescope system will be a premier tool for studying the first stars and galaxies that emerged from the cosmic "dark ages" billions of years ago. These objects now are seen at great cosmic distances, with most of their light stretched out to millimeter and submillimeter wavelengths by the expansion of the Universe.

In the more nearby Universe, ALMA will provide an unprecedented ability to study the processes of star and planet formation. Unimpeded by the dust that obscures visible-light observations, ALMA will be able to reveal the details of young, still-forming stars, and is expected to show young planets still in the process of developing. In addition, ALMA will allow scientists to learn in detail about the complex chemistry of the giant clouds of gas and dust that spawn stars and planetary systems.

Many other astronomical specialties also will benefit from the new capabilities of ALMA, In addition, "We know that every time in the past that a new wavelength region has been opened up, as ALMA will do, we have been surprised by entirely unexpected discoveries that significantly changed our understanding of the Universe. We also expect the unexpected from ALMA," Sargent said.

Adapted from materials provided by National Radio Astronomy Observatory.

http://www.sciencedaily.com:80/releases/2008/02/080215151212.htm

Virtuality and reality 'to merge'

By Darren Waters
Technology editor, BBC News website, in San Francisco

Computers the size of blood cells will create fully immersive virtual realities by 2033, leading inventor Ray Kurzweil has predicted.

Exponential growth in processing power and the shrinking of technology would see the development of microscopic computers, he said.

"We will see a billion-fold increase in the price-performance of computers in the next 25 years," he said.

"Virtual will compete with reality," he told the Game Developers Conference.

Pea-sized computer

Mr Kurzweil said it was possible to accurately predict the growth and change in computing power by looking at how it had developed over the last 50 years.

"There will be a 100,000-fold shrinking of computer technology over the next 25 years," he said.

"Today you can put a pea-sized computer inside your brain, if you have Parkinson's disease and want to replace the biological neurons that were destroyed by the disease."

He said a billion-fold increase in computing performance and capability over the next 25 years coupled with the 100,000 fold shrinking, would lead to "blood cell-size devices... that can go inside our bodies and keep us healthy and inside our brain and expand our intelligence".

He said the blood cell computers would be able to "produce full immersion virtual reality from inside the nervous system".

He said the games industry had to be thinking about the future development of computing now.

"The games industry fits in well with the acceleration of progress; in no other industry do you feel that more than games."

Mr Kurzweil, who invented the flat bed scanner and text-to-speech synthesis, said the virtual world was a misnomer.

"In virtual worlds we do real romance, real learning, real business. Virtual reality is real reality."

He added: "Games are the cutting edge of what is happening - we are going to spend more of our time in virtual reality environments.

"Fully emergent games is really where we want to go. We will do most of our learning through these massively parallel interactions."

"Play is how we principally learn and principally create," he said.

News, features and footage from the GDC 2008 in San Francisco
Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/7258105.stm

Published: 2008/02/22 01:16:10 GMT

Microsoft set to open up software
Microsoft has announced that it will open up the technology of some of its leading software to make it easier to operate with rivals' products.

The technology giant is to publish key software blueprints on its website.

It also promised not to sue open source developers for making that software available for non-commercial use.

Microsoft is being investigated by the European Commission on the grounds that limiting access to its technology could be stopping competition.

Implementation?

"The Commission would welcome any move towards genuine interoperability," it said.

"Nonetheless, the Commission notes that today's announcement follows at least four similar statements by Microsoft in the past on the importance of interoperability."

In January, the Commission launched two formal investigations into Microsoft for suspected abuse of its dominant market position, including one on the interoperability of its software.

The commission said it would assess whether the principles announced on Thursday were in fact "implemented in practice".

Microsoft chief executive officer Steve Ballmer said: "Our goal is to promote greater interoperability, opportunity and choice for customers and developers throughout the industry by making our products more open and by sharing even more information about our technologies."

In 2004, the commission fined Microsoft 497m euros (£375m, $735m) and forced it to offer a version of its Windows operating system without Microsoft's own media player.

The firm was also told to give competitors more information about how Windows operates, so their own software could work better with the operating system, which runs on some 90% of the world's computers.

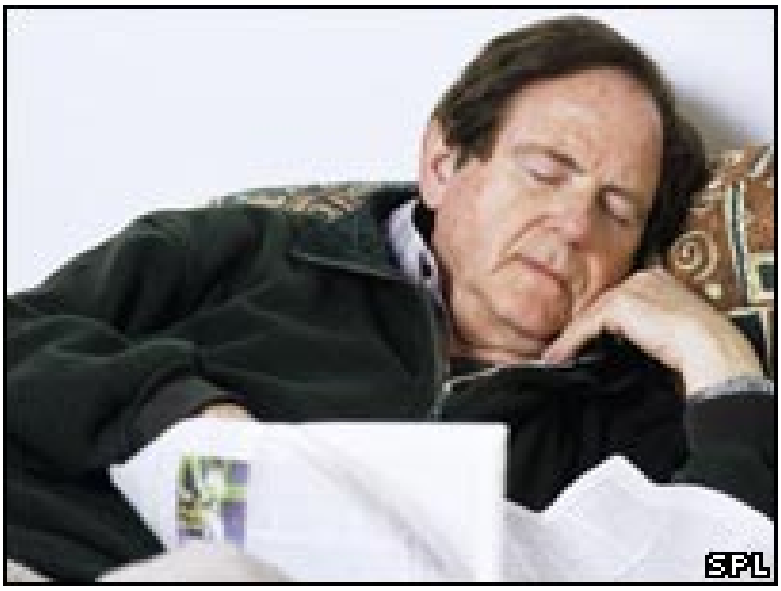
Microsoft recently made an unsolicited bid to acquire Yahoo in a cash-and-share deal worth more than $40bn (£20.4bn), but the move was rejected.

Since then, Microsoft has stepped up its campaign to buy the firm by hiring a company that specialises in take over deals.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/business/7257411.stm

Published: 2008/02/21 18:11:16 GMT

Daytime dozing 'stroke warning'
Regular unintentional daytime dozing may be an early warning sign of stroke in elderly people, say US researchers.



For those who had a habit of nodding off, the risk of stroke was two to four times higher than for those who never fell asleep in the day, a study found.

Speaking at the International Stroke Conference, the team advised doctors to check out older people who found they were dropping off in front of the TV.

The study asked 2,000 people how often they dozed off in different situations.

These included while watching TV, sitting and talking to someone, sitting quietly after a lunch without alcohol and stopping briefly in traffic while driving.

> **But the real question is: 'What are we doing to our bodies?'. Sleepiness obviously puts us at risk of stroke**
> Dr Bernadette Boden-Albala

The risk of stroke over the next two years was 2.6 times greater for people who reported "some dozing" compared to those with no dozing.

Among those who reported "significant dozing" the risk was 4.5 times higher.

The researchers also found the risk of heart attack or death from vascular disease was increased.

Study leader, Dr Bernadette Boden-Albala, assistant professor of neurology at Columbia University, New York, said: "Those are significant numbers. We were surprised that the impact was that high for such a short period of time."

Poor sleep

Previous research has shown that people who suffer from sleep apnoea - short periods when breathing stops during sleep - have an increased stroke risk.

It could be that daytime sleepiness is a sign of sleeping poorly at night because of sleep apnoea.

"Given what's known now, it's worth assessing patients for sleep problems," Dr Boden-Albala said.

"If patients are moderately or significantly dozing, physicians need to think about sending them for further evaluation."

She added other studies had shown people were not getting enough sleep, making them consistently tired.

"But the real question is: 'What are we doing to our bodies?'. Sleepiness obviously puts us at risk of stroke."

Dr Heinrich Audebert, consultant stroke physician at Guy's and St Thomas' Hospital in London said the findings seemed reasonable.

"Sleep apnoea is a risk factor for stroke and in Mediterranean countries the siesta is associated with a little bit of an increased daytime risk of stroke."

He explained that patients with sleep apnoea had increased blood pressure levels during the night.

One other potential cause for the findings could be previous undiagnosed minor strokes causing damage to the brain and leading to more sleepiness during the day, he said.

"What we really encourage is that all patients who have breaks in sleeping in the night should have sleep apnoea screening."

Around 150,000 people in the UK have a stroke every year.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7257270.stm

Published: 2008/02/22 01:05:22 GMT

A Method for Critical Data Theft

By JOHN MARKOFF

SAN FRANCISCO — A group led by a Princeton University computer security researcher has developed a simple method to steal encrypted information stored on computer hard disks.

The technique, which could undermine security software protecting critical data on computers, is as easy as chilling a computer memory chip with a blast of frigid air from a can of dust remover. Encryption software is widely used by companies and government agencies, notably in portable computers that are especially susceptible to theft.

The development, which was described on the group's Web site Thursday, could also have implications for the protection of encrypted personal data from prosecutors.

The move, which cannot be carried out remotely, exploits a little-known vulnerability of the dynamic random access, or DRAM, chip. Those chips temporarily hold data, including the keys to modern data-scrambling algorithms. When the computer's electrical power is shut off, the data, including the keys, is supposed to disappear.

In a technical paper that was published Thursday on the Web site of Princeton's Center for Information Technology Policy, the group demonstrated that standard memory chips actually retain their data for seconds or even minutes after power is cut off.

When the chips were chilled using an inexpensive can of air, the data was frozen in place, permitting the researchers to easily read the keys — long strings of ones and zeros — out of the chip's memory.

"Cool the chips in liquid nitrogen (-196 °C) and they hold their state for hours at least, without any power," Edward W. Felten, a Princeton computer scientist, wrote in a Web posting. "Just put the chips back into a machine and you can read out their contents."

The researchers used special pattern-recognition software of their own to identify security keys among the millions or even billions of pieces of data on the memory chip.

"We think this is pretty serious to the extent people are relying on file protection," Mr. Felten said.

The team, which included five graduate students led by Mr. Felten and three independent technical experts, said they did not know if such an attack capability would compromise government computer information because details of how classified computer data is protected are not publicly available.

Officials at the Department of Homeland Security, which paid for a portion of the research, did not return repeated calls for comment.

The researchers also said they had not explored disk encryption protection systems as now built into some commercial disk drives.

But they said they had proved that so-called Trusted Computing hardware, an industry standard approach that has been heralded as significantly increasing the security of modern personal computers, does not appear to stop the potential attacks.

A number of computer security experts said the research results were an indication that assertions of robust computer security should be regarded with caution.

“This is just another example of how things aren’t quite what they seem when people tell you things are secure,” said Peter Neumann, a security researcher at SRI International in Menlo Park, Calif.

The Princeton researchers wrote that they were able to compromise encrypted information stored using special utilities in the Windows, Macintosh and Linux operating systems.

Apple has had a FileVault disk encryption feature as an option in its OS X operating system since 2003. Microsoft added file encryption last year with BitLocker features in its Windows Vista operating system. The programs both use the federal government’s certified Advanced Encryption System algorithm to scramble data as it is read from and written to a computer hard disk. But both programs leave the keys in computer memory in an unencrypted form.

“The software world tends not to think about these issues,” said Matt Blaze, an associate professor of computer and information science at the University of Pennsylvania. “We tend to make assumptions about the hardware. When we find out that those assumptions are wrong, we’re in trouble.”

Both of the software publishers said they ship their operating systems with the file encryption turned off. It is then up to the customer to turn on the feature.

Executives of Microsoft said BitLocker has a range of protection options that they referred to as “good, better and best.”

Austin Wilson, director of Windows product management security at Microsoft, said the company recommended that BitLocker be used in some cases with additional hardware security. That might include either a special U.S.B. hardware key, or a secure identification card that generates an additional key string.

The Princeton researchers acknowledged that in these advanced modes, BitLocker encrypted data could not be accessed using the vulnerability they discovered.

An Apple spokeswoman said that the security of the FileVault system could also be enhanced by using a secure card to add to the strength of the key.

The researchers said they began exploring the utilities for vulnerabilities last fall after seeing a reference to the persistence of data in memory in a technical paper written by computer scientists at Stanford in 2005.

The Princeton group included Seth D. Schoen of the Electronic Frontier Foundation, William Paul of Wind River Systems and Jacob Appelbaum, an independent computer security researcher.

The issue of protecting information with disk encryption technology became prominent recently in a criminal case involving a Canadian citizen who late in 2006 was stopped by United States customs agents who said they had found child pornography on his computer.

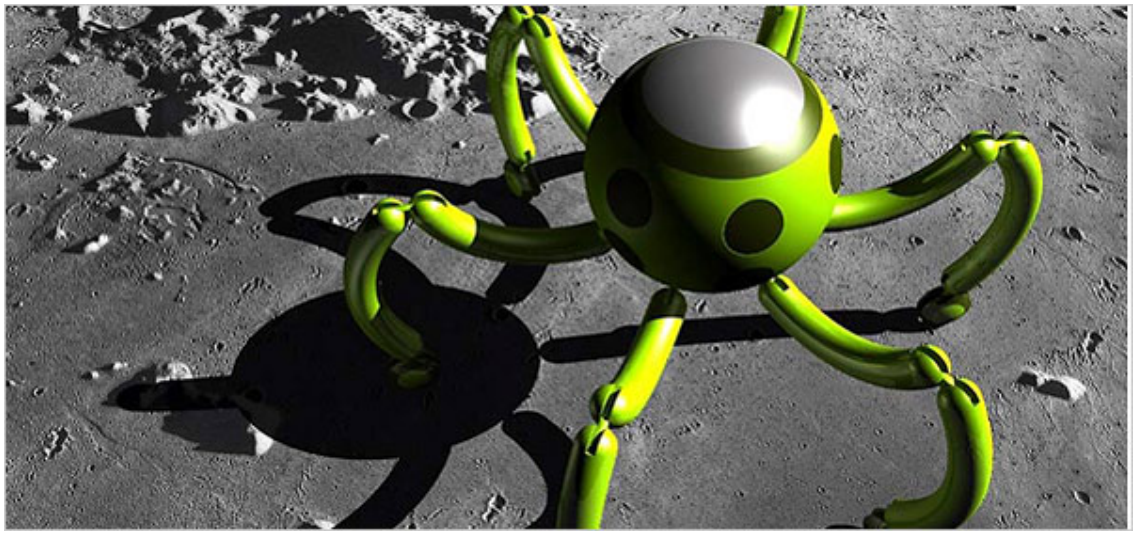
When the agents tried to examine the machine later, they discovered that the data was protected by encryption. The suspect has refused to divulge his password. A federal agent testified in court that the only way to determine the password otherwise would be with a password guessing program, which could take years.

A federal magistrate ruled recently that forcing the suspect to disclose the password would be unconstitutional.

http://www.nytimes.com/2008/02/22/technology/22chip.html?_r=1&th=&adxnnl=1&oref=slogin&emc=th&adxnnlx=1203696314-LQBsFDFV6NQT92NJMPFCJw

A Google Competition, With a Robotic Moon Landing as a Goal

By BRAD STONE



MOUNTAIN VIEW, Calif. — More than three decades after the last Apollo astronauts roamed the lunar surface, disparate universities, open-source engineers and quixotic aerospace start-ups are planning to start their own robotic missions to the Earth's barren cousin.

The return to the moon is part of the Google Lunar X Prize, a competition sponsored by Google with $30 million in prizes for the first two teams to land a robotic rover on the moon and send images and other data back home.

At Google's headquarters here on Thursday, 10 teams from five countries announced their intention to participate in the competition. They include a team led by William L. Whitaker, a professor at Carnegie Mellon University and renowned roboticist; an affiliation of four universities and two major aerospace companies in Italy; and one group that is a loose association of engineers coordinating their efforts online.

At the event, the new lunar explorers shared some high-minded goals, like reigniting moon exploration and jump-starting an age of space commerce.

"This is about developing a new generation of technology that is cheaper, can be used more often and will enable a new wave of explorers," said Peter H. Diamandis, chairman of the X Prize Foundation.

Addressing the X Prize teams and journalists, Sergey Brin, Google's co-founder, compared his company's support of the competition with other companies' sponsorship of yacht races. "The idea we can help spur the return to the moon and maybe even do it more quickly than some of the national plans is really exciting to me," Mr. Brin said.

Google will pay $20 million to the first team that lands on the moon, sends a package of data back to Earth, then travels at least 500 meters and sends another data package. The second team to accomplish the goals will win $5 million. Bonuses are offered for feats like visiting a historic landing site and finding and detecting lunar ice, but the prize money starts to shrink if the mission is not accomplished by 2012.

Dr. Whitaker of Carnegie Mellon is leading a team that includes the University of Arizona and Raytheon, the military contractor. He said he planned to use kerosene and oxygen to fuel his rocket, and once it is on the moon, to send a rover to the site of the first moon landing in the Sea of Tranquillity. "Our extravaganza will be at Apollo 11," he said.

The overall effort could cost tens of millions of dollars, he said, easily exceeding the size of the prize purse.

Fred J. Bourgeois, the head of Frednet, the group of engineers who are collaborating online in the manner of open-source software developers, said that his team was building a toaster-size lunar lander that, once on the moon, would unleash a cellphone-size rover. “We think it’s a lot cheaper to put a cellphone on the moon than an S.U.V.,” Mr. Bourgeois said.

NASA has announced plans to return astronauts to the moon as early as 2020. Though robotic missions are easier to achieve, the X Prize competitors still face formidable challenges, not to mention extravagant costs. Generating the rocket thrust to escape Earth’s gravity is expensive and risky. Once on the moon, robotic rovers may have to survive temperatures that can drop to 250 degrees below zero.

There was some discord at the event. A video produced by the X Prize Foundation, promoting reasons to revisit the moon, described the mining of silicon, which is abundant in the lunar soil. The video claimed that the material could be used in space to construct solar-powered satellites that would transmit cheap and abundant energy to Earth.

In a question-and-answer session, Dr. Harold A. Rosen, an inventor of the geostationary satellite who is heading his own X Prize team, called that claim “one of the most outrageous ideas I’ve ever heard.” He added: “I can think of about a hundred thousand more efficient ways of getting energy on Earth than that.”

The X Prize Foundation is a Los Angeles-based nonprofit group that also managed the Ansari X Prize, a race between teams to send a manned rocket craft into suborbital space.

A team led by the aerospace designer Burt Rutan won that competition in 2004.

http://www.nytimes.com/2008/02/22/business/22space.html?th&emc=th

The Soul in the New Machines

By NICOLAI OUROUSSOFF

Bioengineered crossbreeds. Temperamental robots. Spermatozoa imprinted with secret texts. Although the fascination with organic form has been around since the Renaissance, we have now entered an age in which designers and architects are drawing their inspiration from hidden patterns in nature rather than from pretty leaves or snowflakes. The results can be scary, but they may also hold the key to paradise.

"Design and the Elastic Mind," an exhilarating new show opening on Sunday at the Museum of Modern Art, makes the case that through the mechanism of design, scientific advances of the last decade have at least opened the way to unexpected visual pleasures.

As revolutionary in its own way as MoMA's "Machine Art" exhibition of 1934, which introduced Modern design to a generation of Americans, the exhibition is packed with individual works of sublime beauty. Like that earlier show, it is shaped by an unwavering faith in the transformative powers of technology.

Yet the exhibition's overarching theme, the ability to switch fluidly from the scale of the atom to the scale of entire cities, may sound a death knell for the tired ideological divides of the last century, between modernity and history, technology and man, individual and collective. It should be required viewing for anyone who believes that our civilization is heading back toward the Dark Ages.

Organized by Paola Antonelli, the show opens with an act of high-tech graffiti. A can of spray paint is suspended from a system of cables and pulleys in front of a wall. A small motor guided by computer software winds and unwinds the cables, moving the spray can methodically across the white surface to spell out the show's title.

It is a nice, mischievous touch. And the precision of the script, in contrast to the paint's fuzzy edges or the occasional drip, reinforces the show's point that the old Manichaean duality between the artist and artificial intelligence, nature and machine, no longer holds.

To create "The Honeycomb Vase," for instance, Tomas Gabzdil Libertiny designed a temporary frame in the shape of a squat vase with a slender neck. A colony of nearly 40,000 bees then went to work for a week constructing a hive over it in what the designer calls "slow prototyping" — a pointed reference to the methodical repetition of the old assembly line.

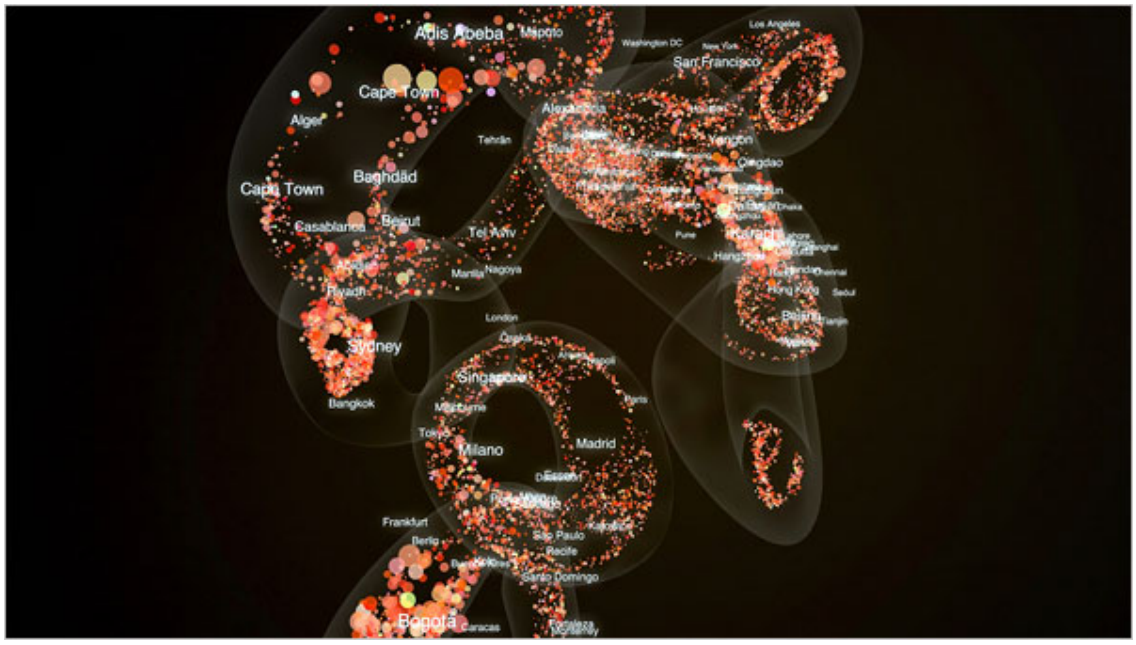
The resulting voluptuous, translucent form reflects a close collaboration between man and nature in which the artist serves as a gentle guide before allowing the bees to take over.

Similarly, Joris Laarman's "Bone Chair" was created with computer software that mimics the creation of human bones. The weight and stresses on a typical chair are programmed into the computer, which then works out an appropriate "bone" structure, churning out a series of increasingly refined prototypes. (The final computer version has a raw, undigested quality, but Mr. Laarman couldn't resist adding a final dash of aesthetic refinement by smoothing over the rough edges, a nice little example of how reluctant some designers are to yield control.)

Other designers are more concerned with developing strategies that allow the machine to adapt to individual tastes rather than with creating the perfect prototype. Using rapid manufacturing systems, the Swedish team known as Front Design have developed a process in which a person sketches a piece of furniture in the air, which is then recorded with motion-capture video technology and transformed into a digital file. The file can then be used to generate a laser-cut piece of real furniture. Individual desire takes precedence over mass consumer tastes.

In all of these cases the computer's grasp of complex underlying patterns allows the designer to create objects that are not only superefficient but also remarkably adaptable.

B



ut the show is about more than gorgeous, environmentally sensitive design. The human body is repositioned as part of a fluid, elastic chain that extends from minuscule atomic particles to global communication networks.

The best example of this approach is Benjamin Aranda and Chris Lasch's "Rules of Six," which uses algorithms to fashion an organically based architecture. Mimicking the growth patterns of microscopic nanostructures, they envisioned an unpredictable, self-generating landscape that can multiply indefinitely without sacrificing stability. Their design is indifferent to scale: the sprawling matrix of three-dimensional interlocking hexagons could represent rooms, buildings or entire urban neighborhoods.

In another fascinating if fanciful application of nanotechnology, the typeface designer Oded Ezer proposes using it to imprint incantatory typed messages on spermatozoa, the high-tech equivalent of a primitive fertility ritual.

The ease with which human designers can shift from the atomic to the global is driven home by the show's layout, designed by Lana Hum. Visitors pass between two walls that converge slightly, to create a forced perspective — an architectural trick that extends all the way back to Palladio in the 16th century but here makes you feel like Alice tumbling through the looking glass.

Suddenly you are in a space packed with unfamiliar objects, like a trade fair. The scales shift once again; dystopian visions seep into the picture. "New City," a projected three-dimensional display of a virtual world by Peter Frankfurt, Greg Lynn and Alex McDowell, is a model of an idealized society where buildings, cities and entire geographic regions all flow seamlessly together. It suggests how the Internet could be used as a testing ground for an emerging utopia.

Perhaps the most unnerving project here is "Architecture and Justice" from the Million Dollar Blocks Project, a graphic study by Columbia University's Spatial Information Design Lab. Using the computer to filter through masses of data on prison populations, the group studied several American cities and identified the blocks where the highest concentration of prison inmates lived when they were arrested. That more than $1 million a year is spent on incarcerating people from each one of these blocks is shocking misuse of resources.

The graphic display on a blood-red grid is a bold expression of how the computer can be a powerful analytical tool for dislodging received wisdom and enabling us to examine entrenched social problems through a new lens.

If the show has a weakness, it's when it introduces artsy expressions of futuristic societies that tend to be technologically crude: images of heavy plastic tubes that potential sexual mates can use to sniff each other, for example, or robots that refuse to respond until they are lavished with affection.

The almost unwieldy scope of the exhibition, however, is a virtue: it sends our imaginations spinning in endless directions. The technological optimism and trade-show ambience, for example, may conjure Charles and Ray Eames's gigantic slide displays from the 1959 Moscow Trade Fair, which flaunted the peacetime technology of cold-war America. I left MoMA already dreaming of a followup show that would map out the link between today's new design technologies and the wartime military research that generated them.

Or how about a show that looks at the relationships between technology, modernity and fundamentalism?

But I don't want to detract from the mood. "Design and the Elastic mind" is the most uplifting show MoMA's architecture and design department has presented since the museum reopened in 2004. Thanks to its imaginative breadth, we can begin to dream again.

"Design and the Elastic Mind" opens on Sunday and continues through May 12 at the Museum of Modern Art; (212) 708-9400, moma.org.

http://www.nytimes.com/2008/02/22/arts/design/22elas.html?th&emc=th

Ancient 'Out Of Africa' Migration Left Stamp On European Genetic Diversity

Scientists compared more than 10,000 sequenced genes from 15 African-Americans and 20 European-Americans. The results suggest that European populations have proportionately more harmful variations, though it is unclear what effects these variations actually may have on the overall health of Europeans. (Credit: iStockphoto)

ScienceDaily (Feb. 22, 2008) — Human migration from Africa to Europe more than 30,000 years ago appears to have left a mark on the genes of Europeans today.

A Cornell-led study, reported in the Feb. 21 issue of the journal Nature, compared more than 10,000 sequenced genes from 15 African-Americans and 20 European-Americans. The results suggest that European populations have proportionately more harmful variations, though it is unclear what effects these variations actually may have on the overall health of Europeans.

Computer simulations suggest that the first Europeans comprised small and less diverse populations. That would have allowed mildly harmful genetic variations within those populations to become more frequent over time, the researchers report.

"What we may be seeing is a 'population genetic echo' of the founding of Europe," said Carlos Bustamante, assistant professor of biological statistics and computational biology at Cornell and senior co-author with Andrew Clark, a professor of molecular biology and genetics.

"Since we tend to think of European populations as quite large, we did not expect to see a significant difference in the distribution of neutral and deleterious variation between the two populations," said Bustamante. "It was quite surprising, but when we cross-checked our results to data sets gathered by other groups, we found the same trend."

The researchers focused on single nucleotide polymorphisms (SNPs), where a single DNA base pair (the smallest structural unit) in a gene's sequence had been altered. Genetic variations were classified as to whether a SNP was found in one or both populations. Some of these genetic changes led to amino acid changes in the proteins that the genes express, while others had no effect.

Collaborators at Max Planck Institute in Tübingen, Germany, and Harvard Medical School analyzed the amino acid changes and used a computer algorithm to predict whether the changes alter a protein's structure or function, and classified the changes into three categories: benign, possibly damaging or probably damaging.

Using that information, the Cornell group found that the European sample, while showing overall less genetic variation, had proportionately more amino acid changes and proportionately more harmful amino acid single nucleotide polymorphisms than the African sample.

"It's difficult to tell what the precise impact that a higher proportion of deleterious single nucleotide polymorphisms in the population will have on the average person's health," said Kirk Lohmueller, a graduate student in both Bustamante's and Clark's labs and the paper's lead author. "More detailed studies that involve sequencing many individuals both with and without certain diseases would better enable us to get at this question."

Future research may also reveal similar signatures as other populations left Africa for other geographic destinations.

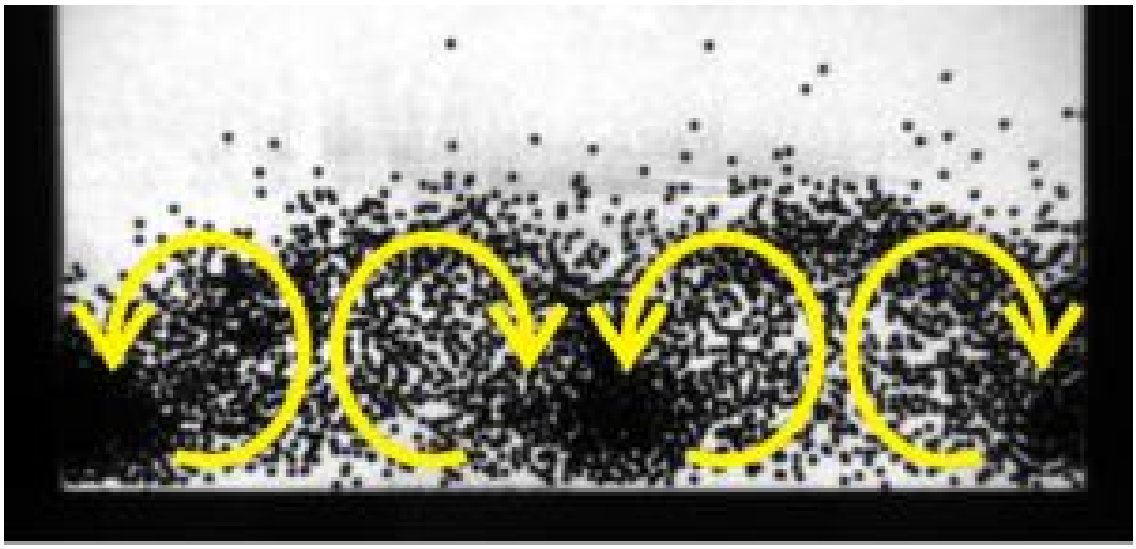
Other Cornell co-authors include Amit Indap, Adam Boyko and Ryan Hernandez as well as Rasmus Nielsen, a former Cornell faculty member now at the University of Copenhagen, and Melissa Hubisz, a former Cornell programmer now at the University of Chicago. Celera Diagnostics performed the gene sequences.

The study was funded by the National Institutes of Health and National Science Foundation.

Adapted from materials provided by Cornell University.

http://www.sciencedaily.com:80/releases/2008/02/080220132608.htm

Granular Matter On The Boil Behaves Like Fluids



Granular convection, showing the same rolling movement that can be seen in water heating up. (Credit: Image courtesy of University of Twente)

ScienceDaily (Feb. 22, 2008) — When grains are shaken fiercely, they show behaviour that can be compared to water on the boil. Convection takes place, with the typical rolling movement that can also be seen in water. For the first time, researcher Peter Eshuis of the University of Twente in The Netherlands shows this phenomenon in granular matter using a high speed camera. His research gains a better understanding of the behaviour of these materials that are often used and produced in industry. Convection can be noticed in water when it nears the boiling point. Rolling movements then occur, to get rid of excess heat: heated fluid rises and cooler water falls, causing a roll. A similar and beautiful effect is seen in little balls shaken hard: starting with an eruption of rising fast balls that go down again, clusters are formed and a rotating movement starts. Just like in fluid, there are balls with lower energy clustering and with higher energy, moving fast. Analogous to the temperature of the boiling plate heating fluids, the shaking energy gives rise to phase transitions.

Before convection starts, at lower shaking intensities, the balls already show behaviour typical to fluids: in fluids this is called the Leidenfrost effect, when a droplet is 'floating' on a thin layer of gas. The same happens with vertically shaken balls: a packed cluster of balls 'floats' on a layer of fast moving balls. This layer is therefore called 'granular gas'. Eshuis describes the transition from the Leidenfrost condition towards convection. This is not just a matter of rising the level of energy, he found out: there has to be an instability that causes the onset of convection. This instability causes some balls to cluster and others to free themselves.

Stagnation

Granular matter like grain, sugar, sand and pills, often give rise to unexpected effects during transport, processing or storage. This often causes stagnation in industrial processes or excessive energy consumption. Better understanding of the behaviour of the materials, like Eshuis presents in his thesis, helps to prevent these effect. He also proves that many phenomena like clustering of grains can be explained by treating and describing the materials like fluids. Peter Eshuis (1980) studied Applied Physics at the University of Twente and did his PhD-research within the Physics of Fluids research group of prof. Detlef Lohse, part of the Institute of Mechanics, Processes and Control (IMPACT) of the University of Twente.

Adapted from materials provided by University of Twente.

http://www.sciencedaily.com:80/releases/2008/02/080217215051.htm

Fastest Computer: One Million Trillion 'Flops' Per Second Targeted

ScienceDaily (Feb. 22, 2008) — Preparing groundwork for an exascale computer is the mission of the new Institute for Advanced Architectures, launched jointly at Sandia and Oak Ridge national laboratories.

An exaflop is a thousand times faster than a petaflop, itself a thousand times faster than a teraflop. Teraflop computers —the first was developed 10 years ago at Sandia — currently are the state of the art. They do trillions of calculations a second. Exaflop computers would perform a million trillion calculations per second.

The idea behind the institute —under consideration for a year and a half prior to its opening — is "to close critical gaps between theoretical peak performance and actual performance on current supercomputers," says Sandia project lead Sudip Dosanjh. "We believe this can be done by developing novel and innovative computer architectures."

Ultrafast supercomputers improve detection of real-world conditions by helping researchers more closely examine the interactions of larger numbers of particles over time periods divided into smaller segments.

"An exascale computer is essential to perform more accurate simulations that, in turn, support solutions for emerging science and engineering challenges in national defense, energy assurance, advanced materials, climate, and medicine," says James Peery, director of computation, computers and math.

One aim, Dosanjh says, is to reduce or eliminate the growing mismatch between data movement and processing speeds.

Processing speed refers to the rapidity with which a processor can manipulate data to solve its part of a larger problem. Data movement refers to the act of getting data from a computer's memory to its processing chip and then back again. The larger the machine, the farther away from a processor the data may be stored and the slower the movement of data.

"In an exascale computer, data might be tens of thousands of processors away from the processor that wants it," says Sandia computer architect Doug Doerfler. "But until that processor gets its data, it has nothing useful to do. One key to scalability is to make sure all processors have something to work on at all times."

Compounding the problem is new technology that has enabled designers to split a processor into first two, then four, and now eight cores on a single die. Some special-purpose processors have 24 or more cores on a die. Dosanjh suggests there might eventually be hundreds operating in parallel on a single chip.

"In order to continue to make progress in running scientific applications at these [very large] scales," says Jeff Nichols, who heads the Oak Ridge branch of the institute, "we need to address our ability to maintain the balance between the hardware and the software. There are huge software and programming challenges and our goal is to do the critical R&D to close some of the gaps."

Operating in parallel means that each core can work its part of the puzzle simultaneously with other cores on a chip, greatly increasing the speed a processor operates on data. The method does not require faster clock speeds, measured in faster gigahertz, which would generate unmanageable amounts of heat to dissipate as well as current leakage.

The new method bolsters the continued relevance of Moore's Law, the 1965 observation of Intel cofounder Gordon Moore that the number of transistors placed on a single computer chip will double approximately every two years.

Another problem for the institute is to reduce the amount of power needed to run a future exascale computer.

"The electrical power needed with today's technologies would be many tens of megawatts — a significant fraction of a power plant. A megawatt can cost as much as a million dollars a year," says Dosanjh. "We want to bring that down."

Sandia and Oak Ridge will work together on these and other problems, he says. "Although all of our efforts will be collaborative, in some areas Sandia will take the lead and Oak Ridge may lead in others, depending on who has the most expertise in a given discipline." In addition, a key component of the institute will be the involvement of industry and universities.

A spontaneous demonstration of wide interest in faster computing was evidenced in the response to an invitation-only workshop, "Memory Opportunities for High-Performing Computing," sponsored in January by the institute.

Workshop organizers planned for 25 participants but nearly 50 attended. Attendees represented the national labs, DOE, National Science Foundation, National Security Agency, Defense Advanced Research Projects Agency, and leading manufacturers of processors and supercomputing systems.

Ten years ago, people worldwide were astounded at the emergence of a teraflop supercomputer — that would be Sandia's ASCI Red — able in one second to perform a trillion mathematical operations.

More recently, bloggers seem stunned that a machine capable of petaflop computing — a thousand times faster than a teraflop — could soon break the next barrier of a thousand trillion mathematical operations a second.

The institute is funded in FY08 by congressional mandate at $7.4 million. It is supported by the National Nuclear Security Administration and the Department of Energy's Office of Science. Sandia is an NNSA laboratory.

Adapted from materials provided by DOE/Sandia National Laboratories.

http://www.sciencedaily.com:80/releases/2008/02/080221162405.htm

The movie industry's changing picture

Studios and theatres are focused on the advantages of going digital as they strive to rebuild their audiences

IAN HARVEY

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Audiences may not have noticed, what with all the glitz and glamour of this weekend's Oscars, but the movie industry is transforming before their eyes.

Film has relied on digital post-production to add those must-have spectacular effects. But even car chases and space battles fade with time – or at least they used to on standard 35 mm film, which can get scratched, torn or melted.

While your neighbourhood theatre – or the behemoth complex next to a highway – may not seem much different, things are changing from film to digital in the projection room. Instead of multiple projectors with racks of film reels, you'll increasingly find souped-up digital light projectors thousands of times more powerful than those at your local Future Shop. It's a movement well under way.

At last year's Toronto International Film Festival, nearly half of the 30 screens were equipped with digital projectors made by Kitchener, Ont.-based Christie, the dominant player in the digital projector market.

Christie is the world leader in digital light projectors, launching a number of major movie premieres, including Beowulf. *(PARAMOUNT PICTURES)*

With more than 4,400 of their top-of-the-line CP2000 series projectors installed in theatres around the world, Christie controls more than 80 per cent of the market. Their machines have launched major digital movie premieres, including *Star Wars: Episode III - Revenge of the Sith*, *Pirates of the Caribbean* and *Beowulf*.

The shift to digital projection is mostly driven by cost: Theatres and movie producers save money, and the machines are flexible enough to allow theatre owners to rapidly accommodate an influx or decrease in demand.

There is some irony in Hollywood's digital renaissance, considering digital technology has caused such consternation in the industry. Theatres have suffered in the 21st century as more consumers opt to watch movies (sometimes pirated) on their own high-tech home theatres. The early part of the decade saw a drop in box office receipts and, despite a recent increase, more theatre tickets were sold in 1998 than in 2007, though the number of films screened has risen, according to boxofficemojo.com.

Studios and theatre chains are banking on digital projectors to entice moviegoers. “The quality is better with digital,” says Gerry Remers, chief operating officer of Christie. “The prints don't get scratched, the

reels aren't shown out of order and don't break, there's no dirt on the gate and the colours are locked in to the original and don't vary from print to print."

The deal clincher for the industry, though, is the savings in operating costs. While film prints cost up to $1,500 (U.S.) each, digital files are stored on 250 GB reusable hard drives that cost a few hundred dollars. However, a multi-screen cinema needs only one copy of the digital film. The projectors, each of which incorporate a server, can be linked together as a network so a film on a single hard drive can be shown on multiple screens. With as many as 4,000 prints of a film required for an average North American release, the savings in digital are substantial.

Still, there are some issues to be worked out by movie theatres and Hollywood. The first is the cost of the projectors themselves. Because of high intensity light sources and sophisticated electronics and computer components, the machines cost about $100,000 each and don't last as long as old-style film projectors.

To offset that, Christie has brought in a financing partner – much like car manufacturers have financing units – to offer leases and loans to customers.

The plan is for studios to levy a virtual print fee, which theatre owners will pay each time a movie is shown. That charge replaces current film rental fees.

Also, since digital data are eminently more vulnerable to unauthorized copying, according to Christie's Mr. Remers, the machines must be equipped with multiple layers of control.

"The prints are digitally watermarked and uniquely identified," he says. "Also, the projectors are sealed. To operate them you need an authorization code. If they're tampered with they will not work until a technician resets it."

Despite the costs, theatre owners are clearly focused on the advantages as they strive to again become an entertainment destination.

Indeed, Cineplex, which has 1,329 screens in 132 locations from B.C. to Quebec, is showing New York Metropolitan Opera season live along with NHL games and other special events.

"It (digital projectors) gives us a lot of flexibility," said Cineplex Entertainment vice president of communications and investor relations Pat Marshall. "If we see people lined up for a movie we can add it to screens, which we can't do now if we don't have a print."

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