Infoteca's E-Journal

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Clue to break-up of ice shelves

US researchers have come up with a way to predict the rate at which ice shelves break apart into icebergs.

These sometimes spectacular occurrences, called calving events, are a key step in the process by which climate change drives sea level rise.

Computer models that simulate how ice sheets might behave in a warmer world do not describe the calving process in much detail, Science journal reports.

Until now, the factors controlling this process have not been well understood.

Ice sheets, such as those in Antarctica and Greenland, spread under their own weight and flow off land over the ocean water.

Ice shelves are the thick, floating lips of ice sheets or glaciers that extend out past the coastline.

The Ross Ice Shelf in Antarctica floats for as much as 800km (500 miles) over the ocean before the edges begin to break and create icebergs. But other ice shelves may only edge over the water for a few kilometres.

A team led by Richard Alley at Pennsylvania State University, US, analysed factors such as thickness, calving rate and strain rate for 20 different ice shelves.

"The problem of when things break is a really hard problem because there is so much variability," said Professor Alley.

"Anyone who has dropped a coffee cup knows this. Sometimes the coffee cup breaks and sometimes it bounces."

The team's results show that the calving rate of an ice shelf is primarily determined by the rate at which the ice shelf is spreading away from the continent.

The researchers were also able to show that narrower shelves should calve more slowly than wider ones.

Ice cracking off into the ocean from Antarctica and Greenland could be the main contributor to global sea level rise in the future.

If all the ice in Greenland and Antarctica melted, seas would rise by more than 60m (200ft).

The UN Intergovernmental Panel on Climate Change in its 2007 assessment forecast that seas could rise by 18 to 59 cm (7-23ins) this century. However, in giving those figures, it conceded that ice behaviour was poorly understood.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7753228.stm

Published: 2008/11/27 20:14:59 GMT

Original Sins

By DAVID GATES

A MERCY

By Toni Morrison

167 pp. Alfred A. Knopf. $23.95

The Greeks might have invented the pastoral, the genre in which the rustic life is idealized by writers who don't have to live it, but it's found its truest home in America. To Europeans of the so-called Age of Discovery, the whole North American continent seemed a sort of Edenic rod and gun club, and their descendants here still haven't gotten over their obsession with the pure primal landscapes they despoil with their own presence. A straight line — if only spiritually — runs from Fenimore Cooper's wild Adirondacks and Hawthorne's sinister Massachusetts forests to Hemingway's "Big Two-Hearted River" to Cheever's domesticated locus amoenus of Shady Hill to the theme park in George Saunders's pointedly titled "Pastoralia" — where slaughtered goats are delivered to employees in Neolithic costume through a slot in the wall of their cave, much as Big Macs appear at a drive-through window. The line even leads to "Naked Lunch," which pronounces America "old and dirty and evil before the settlers, before the Indians" — simply a calculated blasphemy. Apply enough ironic backspin, and almost any American novel this side of "Bright Lights, Big City" could be called "American Pastoral." Or for that matter, "Paradise Lost."

Toni Morrison has already used the title "Paradise" for the 1998 novel that I think is her weakest. But it would have been a good fit for her new book, "A Mercy," which reveals her, once more, as a conscious inheritor of America's pastoral tradition, even as she implicitly criticizes it. Her two greatest novels,

"Song of Solomon" and "Beloved," render the rural countryside so evocatively that you can smell the earth; even in the urban novel "Jazz," the most memorable images are of the South its characters have left behind. But Morrison, of course, is African-American, and hers is a distinctly postcolonial pastoral: a career-long refutation of Robert Frost's embarrassing line "The land was ours before we were the land's." The plantation called Sweet Home, in "Beloved," is neither sweet to its slaves nor home to anyone, except the native Miamis, of whom nothing is left but their burial mounds. In "A Mercy," a 17th-century American farmer — who lives near a town wink-and-nudgingly called Milton — enriches himself by dabbling in the rum trade and builds an ostentatious, oversize new house, for which he orders up a fancy wrought-iron gate, ornamented with twin copper serpents: when the gate is closed, their heads meet to form a blossom. The farmer, Jacob Vaark, thinks he's creating an earthly paradise, but Lina, his Native American slave, whose forced exposure to Presbyterianism has conveniently provided her with a Judeo--Christian metaphor, feels as if she's "entering the world of the damned."

In this American Eden, you get two original sins for the price of one — the near extermination of the native population and the importation of slaves from Africa — and it's not hard to spot the real serpents: those creatures Lina calls "Europes," men whose "whitened" skins make them appear on first sight to be "ill or dead," and whose great gifts to the heathens seem to be smallpox and a harsh version of Christianity with "a dull, unimaginative god." Jacob is as close as we get to a benevolent European. Although three bondswomen (one Native American, one African and one "a bit mongrelized") help run his farm, he refuses to traffic in slaves; the mother of the African girl, in fact, has forced her daughter on him because the girl is in danger of falling into worse hands and he seems "human." Yet Jacob's money is no less tainted than if he'd wielded a whip himself: it simply comes from slaves he doesn't have to see in person, working sugar plantations in the Caribbean. And the preposterous house he builds with this money comes to no good. It costs the lives of 50 trees (cut down, as Lina notes, "without asking their permission"), his own daughter dies in an accident during the construction, and he never lives to finish it.

True, some of the white settlers are escapees from hell: Jacob's wife, Rebekka, whom he imported sight unseen from London, retains too-vivid memories of public hangings and drawings-and-quarterings. "The pile of frisky, still living entrails held before the felon's eyes then thrown into a bucket and tossed into the Thames; fingers trembling for a lost torso; the hair of a woman guilty of mayhem bright with flame." America, she figures, can hardly be worse. But even the relatively kindly Rebekka (kindly, that is, until she nearly dies of smallpox herself and gets religion) and the relatively human Jacob have that European brimstone clinging to them, and it's stinking up the place. One native sachem diagnoses their unique pathology: "Cut loose from the earth's soul, they insisted on purchase of its soil, and like all orphans they were insatiable. It was their destiny to chew up the world and spit out a horribleness that would destroy all primary peoples." This sounds like P.C. cant, and even Lina doubts that all Europes are Eurotrash. But the sachem's got a point. Does anybody own the earth we all inhabit as brothers and sisters? From that perspective, property really is theft, and if you don't think Europeans did the thieving, I've got $24 worth of beads I'd like to sell you.

Or if Europeans aren't the only serpents in the garden — after all, "A Mercy" also implicates Africans in the slave trade — this theory, advanced by an African woman captured by rival tribesmen and shipped to Barbados, gets to the heart of the problem: "I think men thrive on insults over cattle, women, water, crops. Everything heats up and finally the men of their families burn we houses and collect those they cannot kill or find for trade." Men! You can't live with 'em and (since women "did not fell 60-foot trees, build pens, repair saddles, slaughter or butcher beef, shoe a horse or hunt") you can't live without 'em. Not to mention that old-as-Eden matter of sexual attraction. Florens, the black girl whose mother entrusted her to Jacob, and whose feeling of abandonment rules the rest of her life, falls uncontrollably in lust with a free black man, the smith who builds Jacob's gate. "The shine of water runs down your spine and I have shock at myself for wanting to lick there. I run away into the cowshed to stop this thing from happening inside me. Nothing stops it." In their last scene together, the blacksmith rejects her for being a slave — not to Jacob, but to her own desire. "You alone own me," she tells him. "Own yourself, woman," he answers. "You are nothing but wilderness. No constraint. No mind." If you've ever read a Toni Morrison novel, you can already predict that Florens does end up owning herself and that it's a bitter blessing. Her only compensation for the loss of her mother and her lover is that she comes to write her

own story, carving the letters with a nail into the walls of her dead master's unfinished and abandoned house.

"A Mercy" has neither the terrible passion of "Beloved" — how many times can we ask a writer to go to such a place? — nor the spirited ingenuity of "Love," the most satisfying of Morrison's subsequent novels. But it's her deepest excavation into America's history, to a time when the South had just passed laws that "separated and protected all whites from all others forever," and the North had begun persecuting people accused of witchcraft. (The book's most anxious moment comes when a little white girl goes hysterical at the sight of Florens and hides behind her witch-hunting elders.) Postcolonialists and feminists, perhaps even Greens and Marxists, may latch onto "A Mercy," but they should latch with care, lest Morrison prove too many-minded for them. This novel isn't a polemic — does anybody really need to be persuaded that exploitation is evil? — but a tragedy in which "to be given dominion over another is a hard thing; to wrest dominion over another is a wrong thing; to give dominion of yourself to another is a wicked thing."

Except for a slimy Portuguese slave trader, no character in the novel is wholly evil, and even he's more weak and contemptible than mustache-twirlingly villainous. Nor are the characters we root for particularly saintly. While Lina laments the nonconsensual deaths of trees, she deftly drowns a newborn baby, not, as in "Beloved," to save it from a life of slavery, but simply because she thinks the child's mother (the "mongrelized" girl who goes by the Morrisonian name of Sorrow) has already brought enough bum luck to Jacob's farmstead. Everyone in "A Mercy" is damaged; a few, once in a while, find strength to act out of love, or at least out of mercy — that is, when those who have the power to do harm decide not to exercise it. A negative virtue, but perhaps more lasting than love.

This oddly assorted household — slaves, indentured servants and a wife shipped to her husband in exchange for payment to her family — exhibits varying degrees of freedom and dominion, and it holds together, for a while, thanks to a range of conflicting motivations. "They once thought they were a kind of family because together they had carved companionship out of isolation. But the family they imagined they had become was false. Whatever each one loved, sought or escaped, their futures were separate and anyone's guess. One thing was certain, courage alone would not be enough." The landscape of "A Mercy" is full of both beauties and terrors: snow "sugars" eyelashes, yet icicles hang like "knives"; a stag is a benign and auspicious apparition, yet at night "the glittering eyes of an elk could easily be a demon." But whatever the glories and the rigors of nature may signify to the civilized, for these characters, living in the midst of it, nature doesn't signify. It's simply to be embraced or dreaded — like the people with whom they have to live. In Morrison's latest version of pastoral, it's only mercy or the lack of it that makes the American landscape heaven or hell, and the gates of Eden open both ways at once.

David Gates's most recent book is "The Wonders of the Invisible World," a collection of stories.

http://www.nytimes.com/2008/11/30/books/review/Gates-t.html?8bu&emc=bua1

Chance and Circumstance

By DAVID LEONHARDT

OUTLIERS

The Story of Success.

By Malcolm Gladwell.

Illustrated. 309 pp. Little, Brown & Company. $27.99

In 1984, a young man named Malcolm graduated from the University of Toronto and moved to the United States to try his hand at journalism. Thanks to his uncommonly clear writing style and keen eye for a story, he quickly landed a job at The Washington Post. After less than a decade at The Post, he moved up to the pinnacle of literary journalism, The New Yorker. There, he wrote articles full of big ideas about the hidden patterns of ordinary life, which then became grist for two No. 1 best-selling books. In the vast world of nonfiction writing, he is as close to a singular talent as exists today.

Or at least that's one version of the story of Malcolm Gladwell. Here is another:

In 1984, a young man named Malcolm graduated from the University of Toronto and moved to the United States to try his hand at journalism. No one could know it then, but he arrived with nearly the perfect background for his time. His mother was a psychotherapist and his father a mathematician. Their professions pointed young Malcolm toward the behavioral sciences, whose popularity would explode in the 1990s. His mother also just happened to be a writer on the side. So unlike most children of mathematicians and therapists, he came to learn, as he would later recall, "that there is beauty in saying something clearly and simply." As a journalist, he plumbed the behavioral research for optimistic lessons

about the human condition, and he found an eager audience during the heady, proudly geeky ’90s. His first book, “The Tipping Point,” was published in March 2000, just days before the Nasdaq peaked.

These two stories about Gladwell are both true, and yet they are also very different. The first personalizes his success. It is the classically American version of his career, in that it gives individual characteristics — talent, hard work, Horatio Alger-like pluck — the starring role. The second version doesn’t necessarily deny these characteristics, but it does sublimate them. The protagonist is not a singularly talented person who took advantage of opportunities. He is instead a talented person who took advantage of singular opportunities.

Gladwell’s latest book, “Outliers,” is a passionate argument for taking the second version of the story more seriously than we now do. “It is not the brightest who succeed,” Gladwell writes. “Nor is success simply the sum of the decisions and efforts we make on our own behalf. It is, rather, a gift. Outliers are those who have been given opportunities — and who have had the strength and presence of mind to seize them.”

He doesn’t actually tell his own life story in the book. (But he lurks offstage, since he does describe the arc of his mother’s Jamaican family.) Instead, he tells other success stories, often using the device of back-to-back narratives. He starts with a tale of individual greatness, about the Beatles or the titans of Silicon Valley or the enormously successful generation of New York Jews born in the early 20th century. Then he adds details that undercut that tale.

So Bill Gates is introduced as a young computer programmer from Seattle whose brilliance and ambition outshine the brilliance and ambition of the thousands of other young programmers. But then Gladwell takes us back to Seattle, and we discover that Gates’s high school happened to have a computer club when almost no other high schools did. He then lucked into the opportunity to use the computers at the University of Washington, for hours on end. By the time he turned 20, he had spent well more than 10,000 hours as a programmer.

At the end of this revisionist tale, Gladwell asks Gates himself how many other teenagers in the world had as much experience as he had by the early 1970s. “If there were 50 in the world, I’d be stunned,” Gates says. “I had a better exposure to software development at a young age than I think anyone did in that period of time, and all because of an incredibly lucky series of events.” Gates’s talent and drive were surely unusual. But Gladwell suggests that his opportunities may have been even more so.

Many people, I think, have an instinctual understanding of this idea (even if Gladwell, in the interest of setting his thesis against conventional wisdom, doesn’t say so). That’s why parents spend so much time worrying about what school their child attends. They don’t really believe the child is so infused with greatness that he or she can overcome a bad school, or even an average one. And yet when they look back years later on their child’s success — or their own — they tend toward explanations that focus on the individual. Devastatingly, if cheerfully, Gladwell exposes the flaws in these success stories we tell ourselves.

The book’s first chapter explores the anomaly of hockey players’ birthdays. In many of the best leagues in the world, amateur or professional, roughly 40 percent of the players were born in January, February or March, while only 10 percent were born in October, November or December. It’s a profoundly strange pattern, with a simple explanation. The cutoff birth date for many youth hockey leagues is Jan. 1. So the children born in the first three months of the year are just a little older, bigger and stronger than their peers. These older children are then funneled into all-star teams that offer the best, most intense training. By the time they become teenagers, their random initial advantage has turned into a real one.

At the championship game of the top Canadian junior league, Gladwell interviews the father of one player born on Jan. 4. More than half of the players on his team — the Medicine Hat Tigers — were born in January, February or March. But when Gladwell asks the father to explain his son’s success, the calendar

has nothing to do with it. He instead mentions passion, talent and hard work — before adding, as an aside, that the boy was always big for his age. Just imagine, Gladwell writes, if Canada created another youth hockey league for children born in the second half of the year. It would one day find itself with twice as many great hockey players.

"Outliers" has much in common with Gladwell's earlier work. It is a pleasure to read and leaves you mulling over its inventive theories for days afterward. It also, unfortunately, avoids grappling in a few instances with research that casts doubt on those theories. (Gladwell argues that relatively older children excel not only at hockey but also in the classroom. The research on this issue, however, is decidedly mixed.) This is a particular shame, because it would be a delight to watch someone of his intellect and clarity make sense of seemingly conflicting claims.

For all these similarities, though, "Outliers" represents a new kind of book for Gladwell. "The Tipping Point" and "Blink," his second book, were a mixture of social psychology, marketing and even a bit of self-help. "Outliers" is far more political. It is almost a manifesto. "We look at the young Bill Gates and marvel that our world allowed that 13-year-old to become a fabulously successful entrepreneur," he writes at the end. "But that's the wrong lesson. Our world only allowed one 13-year-old unlimited access to a time-sharing terminal in 1968. If a million teenagers had been given the same opportunity, how many more Microsofts would we have today?"

After a decade — and, really, a generation — in which this country has done fairly little to build up the institutions that can foster success, Gladwell is urging us to rethink. Once again, his timing may prove to be pretty good.

David Leonhardt is an economics columnist for The Times.

http://www.nytimes.com/2008/11/30/books/review/Leonhardt-t.html?8bu&emc=bua2

'The Doves Were Right'

By RICHARD HOLBROOKE

LESSONS IN DISASTER

McGeorge Bundy and the Path to War in Vietnam

By Gordon M. Goldstein

300 pp. Times Books/ Henry Holt & Company. $25

In 1961, John Fitzgerald Kennedy brought to Washington a new generation of pragmatic young activists who came to be known as the New Frontiersmen. When the journalist Theodore White later wrote a memorable photo essay about them for Life magazine, he called them the "action-intellectuals."

The most celebrated were Secretary of Defense Robert S. McNamara and McGeorge Bundy, whose title — modest by today's standards — was special assistant to the president for national security affairs, but whose importance was great (today the position has a more grandiose title — national security adviser). Mc-Namara, of course, became one of the most controversial public servants in modern times, while Bundy got less attention, except for Kai Bird's excellent 1998 dual biography of him and his brother William (who had served as assistant secretary of state for East Asia).

But in "Lessons in Disaster," Gordon Goldstein's highly unusual book, Bundy emerges as the most interesting figure in the Vietnam tragedy — less for his unfortunate part in prosecuting the war than for his agonized search 30 years later to understand himself.

Bundy was the quintessential Eastern Establishment Republican, a member of a family that traced its Boston roots back to 1639. His ties to Groton (where he graduated first in his class), Yale and then Harvard were deep. At the age of 27, he wrote, to national acclaim, the 'memoirs" of former Secretary of War Henry L. Stimson. In 1953, Bundy became dean of the faculty at Harvard — an astonishing responsibility for someone still only 34. Even David Halberstam, who would play so important a role in the public demolition of Bundy's reputation in his classic, "The Best and the Brightest," admitted that "Bundy was a magnificent dean" who played with the faculty "like a cat with mice."

As he chose his team, Kennedy was untroubled by Bundy's Republican roots —the style, the cool and analytical mind, and the Harvard credentials were more important. "I don't care if the man is a Democrat or an Igorot," he told the head of his transition team, Clark Clifford. "I just want the best fellow I can get for the particular job." And so McGeorge Bundy entered into history — the man with the glittering résumé for whom nothing seemed impossible.

Everyone knows how this story ends: Kennedy assassinated, Lyndon B. Johnson trapped in a war he chose to escalate, Nixon and Kissinger negotiating a peace agreement and, finally, the disastrous end on April 30, 1975, as American helicopters lifted the last Americans off the roof of the embassy. (Well, actually it was a nearby rooftop, but the myth is somehow more accurate than the literal truth.) Bundy had left the Johnson administration a decade earlier, after a dispute with Lyndon Johnson over process, not policy, and he went on to serve as president of the Ford Foundation. But for five years, he had been present at the most critical moments of the escalation, and he had supported all of them; he was one of the primary architects and defenders of the war.

The columnist Joseph Kraft, a friend of Bundy's, once described him as "a figure of true consequence" and "perhaps the only candidate for the statesman's mantle to emerge in the generation that is coming to power." When Bundy died in 1996, another friend, Arthur Schlesinger Jr., said, "a single tragic error prevented him from achieving his full promise as a statesman."

Bundy spoke only occasionally about Vietnam after he left government, but when he did, he supported the war. Yet it haunted him. He knew his own performance in the White House had fallen far short of his own exacting standards, and Halberstam's devastating portrait of him disturbed him far more deeply than most people realized. After remaining largely silent, — except for an occasional defense of the two presidents he had served — for 30 years, Bundy finally began, in 1995, to write about Vietnam. He chose as his collaborator Gordon Goldstein, a young scholar of international affairs. Together they began mining the archives, and Goldstein conducted a series of probing interviews. Bundy began writing tortured notes to himself, often in the margins of his old memos — a sort of private dialogue with the man he had been 30 years earlier — something out of a Pirandello play. Bundy would scribble notes: "the doves were right"; "a war we should not have fought"; "I had a part in a great failure. I made mistakes of perception, recommendation and execution." "What are my worst mistakes?" For those of us who had known the self-confident, arrogant Brahmin from Harvard, these astonishing, even touching, efforts to understand his own mistakes are far more persuasive than the shallow analysis McNamara offers in his own memoir, "In Retrospect." In the middle of the research for the book, Bundy died, five days after his last session with Goldstein. Left with fragments of a work that would never be written, Goldstein spent years piecing them together and finished a manuscript, based on the interviews, which was approved for publication by Yale University Press. But Mary Bundy, who had at first encouraged Goldstein in his project, withdrew her consent for the book, and its publication was permanently shelved. Goldstein then produced a different book with no involvement from the Bundy family, using his interviews and Bundy's notes to himself, which are now in the public collection of the John F. Kennedy Library in Boston. Goldstein thus writes from a unique perspective — not quite inside Bundy's head but not an outside observer. As he says, "In no way is this a book by McGeorge Bundy but rather it is a book about him."

The result is a compelling portrait of a man once serenely confident, searching decades later for self-understanding. Did he sense that his time was running out? From the evidence in this book, it seems possible.

For today's readers, what's most important about "Lessons in Disaster" is not the details of how the United States stumbled into a war without knowing where it was going; that story has been told in hundreds of other books. Goldstein's achievement is quite different: it offers insight into how Bundy, a man of surpassing skill and reputation, could have advised two presidents so badly. On the long shelf of Vietnam books, I know of nothing quite like it. The unfinished quality of Bundy's self-inquest only enhances its power, authenticity and, yes, poignancy.

Goldstein has organized the book chronologically, giving each chapter the title of a "lesson" Bundy derived from his career. This is a sly tribute to one of Bundy's most notable qualities — his wry, ironic sense of humor, which often distanced him from the real-life human consequences of policy. From the 1961 Bay of Pigs invasion, for example, Bundy concludes, "Never Trust the Bureaucracy to Get It Right" — a trivial lesson compared with the human and political costs, but characteristic of Bundy's obsession with process rather than underlying causes. Similarly, the all-important decisions by Johnson that turned

Vietnam irrevocably into an American war in 1965 are summarized under the title “Never Deploy Military Means in Pursuit of Indeterminate Ends.” Even as he searches for truth, Bundy remains Bundy. It is striking how little interest he shows in Vietnam itself, and how little concern he shows for the huge death toll of the war. At one point, he coolly tells Johnson that we should send ground troops even though the chances for success “are between 25 percent to 75 percent” because it would be better for America to lose after sending troops than not to send troops at all! War, to Bundy, seems more an abstraction than a horrible reality.

The one exception — the only time Bundy seemed moved by something real and tangible on the ground — came in February 1965, when Johnson sent Bundy to Vietnam for his only firsthand look. While he was in Saigon, the Vietcong attacked the American air base outside the central highlands town of Pleiku, killing nine American soldiers and wounding 137. Although it was later learned that the Communists did not even realize Bundy was in Saigon, and hardly knew who he was, Johnson and Bundy both assumed Pleiku was a direct answer to Bundy’s visit. Bundy was annoyed that the reaction to his hurried visit to Pleiku the next morning was later characterized by others as emotional. But the evidence is strong that his visit to the wreckage at Pleiku, apparently the closest he ever came to the awful waste of war — moved him greatly, and prompted him even more strongly to advocate bombing North Vietnam.

As it happens, I was part of a small group that dined with Bundy the night before Pleiku at the home of Deputy Ambassador William J. Porter, for whom I then worked. Bundy quizzed us in his quick, detached style for several hours, not once betraying emotion. I do not remember the details of that evening — how I wish I had kept a diary! — but by then I no longer regarded Bundy as a role model for public service. There was no question he was brilliant, but his detachment from the realities of Vietnam disturbed me. In Ambassador Porter’s dining room that night were people far less intelligent than Bundy, but they lived in Vietnam, and they knew things he did not. Yet if they could not present their views in quick and clever ways, Bundy either cut them off or ignored them. A decade later, after I had left the government, I wrote a short essay for Harper’s Magazine titled “The Smartest Man in the Room Is Not Always Right.” I had Bundy — and that evening — in mind. One of the most important conclusions Bundy reached before he died is in Goldstein’s final chapter, “Intervention is a Presidential Choice, Not an Inevitability.” For 40 years there has been a debate over whether Kennedy, had he lived, would have followed the same course as Johnson in Vietnam. In “Counsel to the President,” the book I wrote with Clark Clifford, Kennedy’s lawyer and McNamara’s successor as secretary of defense, Clifford concluded that Kennedy “would have initiated a search for either a negotiated settlement or a phased withdrawal.” Bundy comes to the same conclusion, and carries the thought further. Having watched the two presidents up close as they grappled with Vietnam, Bundy concluded that we must “better understand the indispensable centrality of the commander in chief’s leadership.” A re-elected Kennedy, he says, would “not have to prove himself in Vietnam.”

Bundy never believed in negotiations with the Vietcong or the North Vietnamese. This, coupled with his enduring faith in the value of military force in almost any terrain or circumstance, were his greatest errors. They contributed to a tragic failure. With the nation now about to inaugurate a new president committed to withdraw combat troops from Iraq and succeed in Afghanistan, the lessons of Vietnam are still relevant. McGeorge Bundy’s story, of early brilliance and a late-in-life search for the truth about himself and the war, is an extraordinary cautionary tale for all Americans.

Richard Holbrooke, a former United States ambassador to the United Nations, worked in Vietnam and participated in the Johnson White House’s special Vietnam Task Force.

http://www.nytimes.com/2008/11/30/books/review/Holbrooke-t.html?8bu&emc=bua2

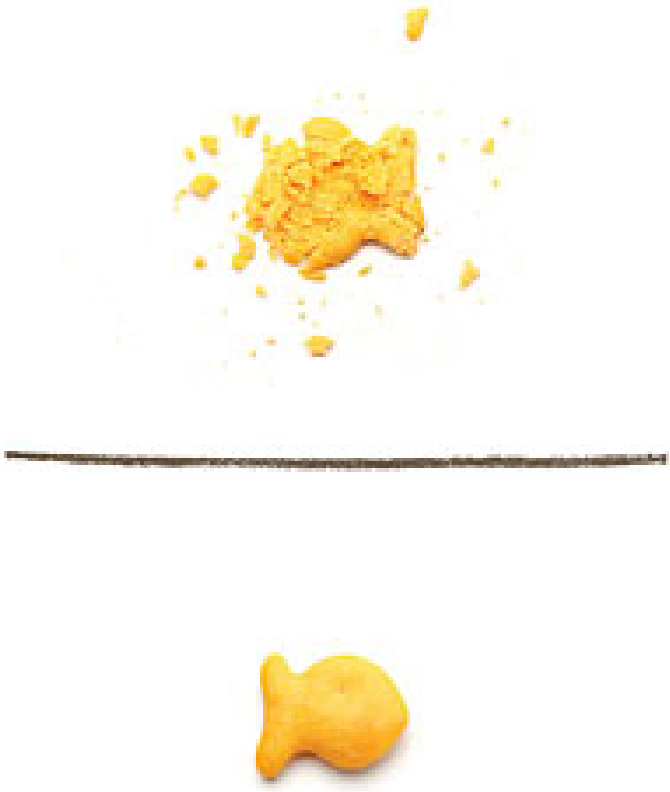
Exit Wounds

By TOM BISSELL

LEGEND OF A SUICIDE

By David Vann

172 pp. University of Massachusetts Press. $24.95



Suicide is an exploded bridge that can never be repaired. All its secondary victims can do is stare across the chasm and hope the other side is more peaceful than this one. In his first book, “A Mile Down,” David Vann wrote of his attempt to surpass the modest seafaring efforts of his father, who killed himself when Vann was a boy. In search of answers, Vann built a ship and set out for the watery depths — only to come close to reuniting with his father in the void. This was an exorcism that wound up needing an exorcism. One hopes, for Vann’s sake, that the novella and five stories in his second book, “Legend of a Suicide,” helped provide it. An author more haunted by paternal amputation would be difficult to imagine. A sadder book about fathers and sons would be impossible to imagine.

The book’s central character is a boy named Roy. The novella and four of the five stories take place in Alaska, where Vann himself grew up, and only the novella steps outside Roy’s first-person narration. While the father’s suicide is dramatized explicitly just once, it exerts its gravitational pull on every page.

From the shores of Vann’s Alaska one can see the Russia of Turgenev’s “Fathers and Sons.” One can also see Richard Ford’s “Rock Springs” and Tobias Wolff’s archipelago of perpetual struggle.

Structurally dependent on epiphany and defiantly plainspoken, “Legend of a Suicide” is about as unfashionable as fiction published in 2008 can possibly be. Its language ranges from the undeniably evocative (“I slipped out into the soft, watery world of Alaskan rain-forest night”) to the iffier register of quasi-Hemingway.Thankfully, examples of the former vastly outnumber the latter.

A few passages nevertheless have a confession-booth, vaguely essayistic feel. In “Ketchikan,” a 30-year-old Roy returns to his Alaskan hometown and, after listing its many eccentricities, notes, “This was overwrought, but it seemed in keeping with the indulgence of this trip, with the extravagance of an attempted return to childhood.” At the story’s end, Roy tells us that “the divorce and suicide that I had let shape my life so permanently had been something else altogether. . . . And what, then, of what I had become?”

It is hard to know who, exactly, is speaking: the art or the artist? In his acknowledgments, Vann writes, a little inelegantly, that his stories are “fictional, but based on a lot that’s true.” Fifty years ago, when writers were romanticized differently, it was less problematic to imagine an author and his narrator as an essentially Siamese-twin phenomenon. Today, such a determined blurring may strike some readers as self-consciously therapeutic or, worse yet, self-serving. Vann’s narrator speaks of the “last beautiful, desperate, far-ranging circlings” of his father’s life, but he may as well be describing the overall method of these stories.

In “Ichthyology,” Roy watches two “slick and merciless” silver-dollar fish, recently introduced to his aquarium, attack a “lazy, boggle-eyed” tankmate, sucking out both its eyes. The story returns, stunningly, to this image in its final lines. Much of Vann’s book works this way. The smallest moments of unease are placed on the narrative scale as if they were lead bars. Suicide gives everything it has not destroyed a dreadful, unfamiliar weight.

In the novella, “Sukkwan Island,” the powerful and supremely vexing centerpiece of the collection, Roy and his father make a final attempt at reconciliation. The father has bought a cabin in the Alaskan wilderness with the intent of spending a year there with his son, homesteading and living off the land. The first half of the novella is narrated from Roy’s close third-person perspective, the second half from the father’s. In the first few pages Vann shows the reader an unassuming set of rustic implements: some rope, a few screws, a battery. By the story’s end the rope has become a noose, the screws have been driven into the reader’s fingernails, and the battery is wired someplace unspeakable.

The father, a dentist who has quit his practice in Fairbanks, imagines himself as a high-north survivalist. He is, in fact, woefully unprepared. He does not know the name of the nearest inhabited island or how to build a cache for winter food or how to repair the cabin’s damaged roof or how to keep the bears away. (Not everyone who lives in places like Alaska is born knowing how to MacGyver a water filter out of bark.) The father does not even have the sense to prevent his increasingly terrified son from overhearing his hopeless nighttime sobs.

“Sukkwan Island” is about the love of a powerless boy for a weak father. While his father goes to pieces, Roy busies himself with fishing and chores, activities that showcase Vann’s grimly observant facility with natural-world detail. When Roy bashes in the head of a Dolly Varden trout, he hunches down “to look at it and watch its colors fade.” An early pink salmon lies “gasping and wild-eyed” after the boy scoops it up by the gills and heaves it onto the beach. (Warning: the fish-trauma-per-page ratio here makes “The Old Man and the Sea” seem like a paean to ichthyophilia.)

Every night, Roy goes to bed to the sound of his father’s weeping. “I’m sorry, Roy,” he eventually tells his son. “I’m really trying. I just don’t know if I can hold on.” Later, after he confesses that he once got crab lice from a prostitute and passed them along to the boy’s stepmother, he asks, “Do you think I’m a monster?” Soon enough, a bit of dialogue as innocent as “Maybe we should go for a hike” becomes a portent of doom.

And yet this man is never hateful. You'd have to go back to books like "The Mayor of Casterbridge" or "The Great Santini" to find a father capable of such loathsome deeds brought to life with such empathy. After one bit of appalling fatherly negligence, Vann writes, "There were no good times after this." And there are 50 pages to go.

The central event of "Sukkwan Island," shocking for several reasons, appears to take place in a parallel universe. The Roy and the father of the other stories cannot be the Roy and the father of this story. Vann does not choose to explain this, and he should not have to. But it is strange, like encountering Borges, in waders, within "A River Runs Through It."

The reportorial relentlessness of Vann's imagination often makes his fiction seem less written than chiseled. One cannot say that Vann does not do humor well because — here, at least — he does not do humor at all. What he does do well is despair and desperation. In spite (or maybe because) of this, he leads the reader to vital places. A small, lovely book has been written out of his large and evident pain. "A father, after all," Vann writes, "is a lot for a thing to be." A son is also a lot for a thing to be; so is an artist. With "Legend of a Suicide," David Vann proves himself a fine example of both.

Tom Bissell's most recent book is "The Father of All Things."

http://www.nytimes.com/2008/11/30/books/review/Bissell-t.html?8bu&emc=bua2

A Passage From India

By GAIUTRA BAHADUR

SEA OF POPPIES

By Amitav Ghosh

515 pp. Farrar, Straus & Giroux. $26

In 1883, the British government sent the accomplished linguist Sir George Grierson to look into alleged abuses in the recruitment of indentured servants from India (known as “coolies”) who ended up on ships bound for British plantations throughout the world. In his diary, Grierson wrote about an encounter with the father of one female coolie in a village along the Ganges, noting that the man “denied having any such relative, and probably she had gone wrong and been disowned by him.” The historical record provides only a trace of this woman: a name, a processing number, a year of emigration.

In his ambitious new novel, “Sea of Poppies,” a finalist for this year’s Man Booker Prize, Amitav Ghosh attempts to fill in the blanks left by the archives. Set partly in Bengal, the scene of Grierson’s inquiry, and drawing on accounts the Englishman left, it opens in 1838 on the eve of the Opium Wars. A former slave ship called the Ibis has been refitted to transport coolies from Calcutta to the sugar estates of Mauritius, and for hundreds of pages we watch as its crew and passengers are slowly assembled until it finally gets on its way.

The first in a projected trilogy, “Sea of Poppies” is big and baggy, a self-styled epic with colossal themes and almost a dozen major characters, including the son of an American slave (who is passing as white), the orphaned daughter of a French botanist (who is passing as a coolie) and an Anglophile raja (who has been wrongly sentenced to a penal colony on Mauritius). But a majority onboard are Indian peasants from the opium-producing countryside, forced by famine or scandal to seek a new life elsewhere. Devoted to reinvention, Ghosh’s plot focuses on one of these villagers: Deeti, a widow who assumes another name and the (lower) caste of a new love as they escape together on the Ibis.

Figures like Deeti, merely hinted at in the official record, have long preoccupied Ghosh — as in his elegant travelogue "In an Antique Land," which shifted between Egypt and India, the 12th century and the 1980s, as he hunted for the story of a slave mentioned in letters between an Arab-Jewish merchant in Mangalore and his associates in Cairo. The reference astonished Ghosh because of its medieval date, "when the only people for whom we can even begin to imagine properly human, individual existences are the literate and the consequential . . . the people who had the power to inscribe themselves physically upon time."

The coolies who inspired "Sea of Poppies" didn't have that power. Unlike Grierson, they didn't leave diaries behind; after all, they couldn't even write. So where does that leave those who would tell their stories? Ghosh is forced to imagine them, based on the limited sources available, but he does so with the instincts of an anthropologist more than a novelist. (He is, in fact, an anthropologist by training.) With the aid of out-of-print dictionaries, he recreates esoteric dialects (Hobson-Jobson, Hinglish, Chinglish and the salty argot of sailors, to name a few). His characters are often incomprehensible to one another, which makes for occasional comedy, but too often they're also incomprehensible to his readers. And his penchant for meticulous detail — the innards of an opium factory, the organization of a coolie ship — impedes the progress of his various plots and subplots. Ghosh obviously wants to make the novel a literary excavation, digging up the stories of people lost to history, but in the process his characters themselves often seem like artifacts.

Deeti, for one, is hard to believe in. And not just because Ghosh gives her a back story as overwrought as the script for a Bollywood movie: wedded to an opium addict too enervated to consummate their marriage, impregnated in lieu by his brother and resigned to die on her husband's funeral pyre until rescued by a hunky untouchable, with whom she elopes. Many of the women who fled India as coolies were indeed upper-caste widows, but there were no brawny heroes to snatch them from their fates. They simply left, alone — an act dramatic enough for that time and place that it shouldn't need the enhancements of pulp plotting.

Deeti's weakness as a character may stem from Ghosh's desire to be an archaeologist of the powerless. That's a noble ambition, but it turns Deeti into little more than a skeleton on which to hang a history. And she has a mystical quality that nags. Wading in the Ganges at the novel's start, she envisions a ship "like a great bird, with sails like wings and a long beak." Though she has never before laid eyes on a schooner like the Ibis, she somehow knows that it is coming for her. At the novel's close, lying one night on the deck of this same vessel, she holds a poppy seed between her fingers. "Here," she tells her lover. "Taste it. It is the star that took us from our homes and put us on this ship. It is the planet that rules our destiny." These are pretty lines, but they don't ring true. Ghosh still seems to be chasing Deeti's ghost in the archives.

Gaiutra Bahadur is working on a book inspired by her great-grandmother, who left Calcutta on a "coolie" ship.

http://www.nytimes.com/2008/11/30/books/review/Bahadur-t.html?8bu&emc=bua2

Gunsmoke

By BEN MACINTYRE

LUCKY BILLY

By John Vernon

294 pp. Houghton Mifflin Company. $24

Billy the Kid still rides through the Old West of the American imagination: part reality, part myth; part outlaw and part instrument of justice; part hero and part homicidal maniac. John Vernon's fictionalized account of Billy the Kid's life starts with the only known photograph of the man, probably taken around 1880, when Henry McCarty (his birth name) would have been around 20, and a year before he was killed by Sheriff Pat Garrett. Vernon describes the man in the picture as "draggle-tailed." With his buck teeth and heavy-lidded eyes he looks, to me, undernourished, detached and slightly deranged, as if only dimly aware of where he is and what he's doing.

But then, people have always seen what they wanted to see in Billy the Kid. His life must be assembled from fragments, from slivers of legend and exaggerated contemporary journalism. Even his name and soubriquet are matters of choice: Henry McCarty, William H. Bonney, Kid Antrim. He was El Chivato to the Mexicans and Billy the Kid to posterity.

Vernon has taken what is known and filled the wide gaps with fiction. The result is a little like an early black-and-white western film: the plot jerks about, the picture wobbles, unfocused characters come and go, often without explanation, and the slow-motion gunplay seems amateurish. But all of this adds to the novel's credibility. There was nothing Hollywood slick about Billy the Kid's short life and squalid death.

The legend of Billy the Kid emerged from the debris of the Lincoln County War, the complex and extremely nasty feud that erupted in New Mexico in 1878, pitting the area's wealthy ranchers against the town merchants, led by James Dolan. McCarty was hired by John Tunstall, an English cattle baron, who appears to have shown him some kindness. In Vernon's story, Billy's loyalty is cheaply bought:

Tunstall's gift of a horse, a saddle and a gun is enough to ensure the young cowboy's lifelong devotion. "He had polish. He was different," Billy declares of the fastidious Englishman, who trims his toenails with silver-and-ivory-handled scissors before climbing into the saddle.

When Tunstall is murdered by the so-called Dolanites, their opponents, the self-styled Regulators, with McCarty among them, set out to avenge his death, sparking a gruesome conflict, fanned by sensational reporting and cynical manipulation. Billy the Kid would eventually be credited with killing one man for each of the 21 years he lived. In truth, he may have killed as few as four people, at least one in self-defense.

Vernon relates the bloody chaos of the Lincoln County War, and McCarty's central role in it, in tangy, blunt prose, larded with home-grown Westernisms. To his credit, he doesn't invest Billy the Kid with any moral weight, or even psychological depth. At the end of the novel, Billy — swaggering, immature and uncertain — seems just as baffled and blown around by events as he is at the start. "There's good in the world and bad in the world and they're wound up together," one character declares. It's a simple, shallow moral, appropriate to this raw moment in American history.

The novel's strange chronology — hopping back and forth in time — further confuses the miasma of murder and retaliation, capture and jailbreak. It's frequently hard to work out which gunman is which, which posse is hunting which, and whose side they're on — probably just what the participants themselves were wondering. The narrative reads in part like an account of a modern gang war among the cactus and sagebrush, a battle for position and prestige, overlaid with a skewed sense of honor but underpinned by animal brutality and a careless approach to the value of a life. "Alls I ever did was shoot a few people," Billy complains.

There's an attractive anger running through the book — at the pointlessness of the killing and the feebleness of justice, at the pistoleros who murder to make cleverer men richer. The Englishman Tunstall is the most appealing character, with his charming, stilted letters written home demanding ever more money from his father to finance an impossible dream. But Tunstall is also flawed, naïve and doomed. "He wasn't that different to you and me," a friend tells the Kid. "He was after the same things. So was James Dolan. Stick it to the Mexes. Make yourself all the dinero you can. Get rich and get out."

When Billy finally gets the bullet that's been following him from the first page, it's framed as anti-climax. Pat Garrett shoots him in a bedroom, in the dark, and then writes a sensational, partly fictional book about his quarry. "I didn't feel much at all," Garrett says. Nor does the reader.

Vernon cleverly ends with a real newspaper clipping from the Santa Fe Weekly Democrat, the sort of overheated nonsense that helped propel McCarty into myth: "Billy the Kid . . . will no more take aim at his fellow man and kill him, just to keep himself in practice."

Billy the Kid was never his own man. Vernon's Billy reflects that "there's plenty of Billies," then adds, "I'm the made-up one." The real Billy the Kid exists only in snapshot. He was invented and reinvented, by himself and others, during his lifetime and after. No one ever caught him, but this novel comes close.

Ben Macintyre's books include "Agent Zigzag: A True Story of Nazi Espionage, Love, and Betrayal" and "The Napoleon of Crime: The Life and Times of Adam Worth, Master Thief."

http://www.nytimes.com/2008/11/30/books/review/Macintyre-t.html?8bu&emc=bua2

A World of a Different Color

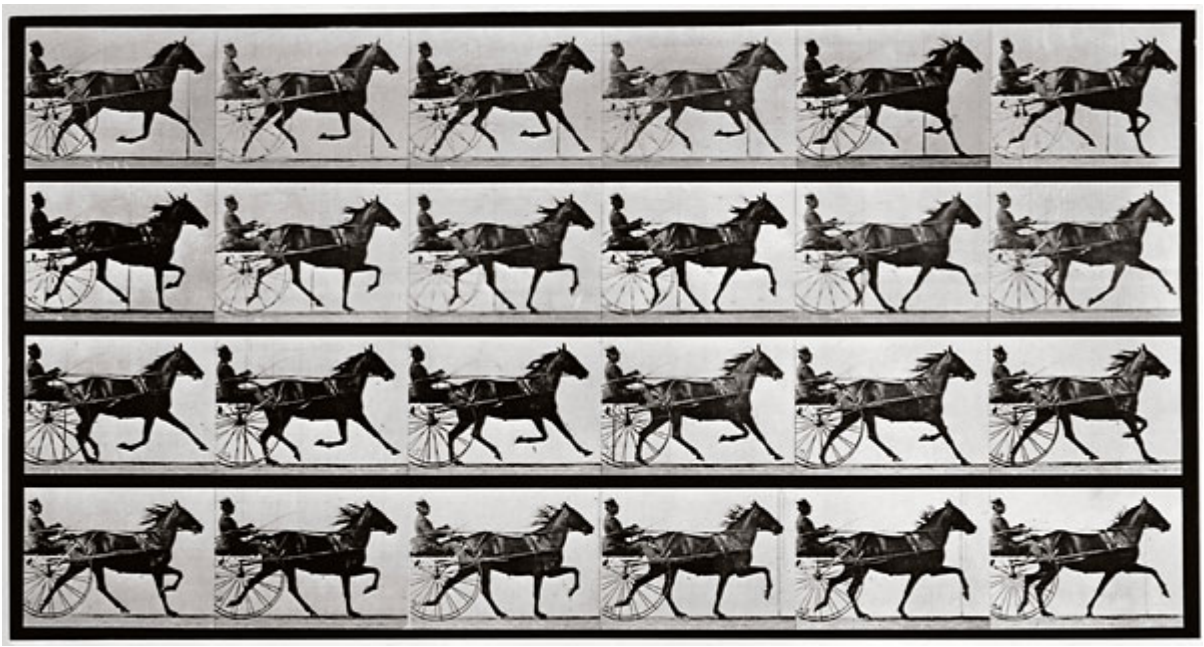
By CALEB CRAIN

HORSES AT WORK

Harnessing Power in Industrial America

By Ann Norton Greene

Illustrated. 322 pp. Harvard University Press. $29.95



Once upon a time, America derived most of its power from a natural, renewable resource that was roughly as efficient as an automobile engine but did not pollute the air with nitrogen dioxide or suspended particulate matter or carcinogenic hydrocarbons. This power source was versatile. Hooked up to the right devices, it could thresh wheat or saw wood. It was also highly portable — in fact, it propelled itself — and could move either along railroad tracks or independently of them. Each unit came with a useful, nonthreatening amount of programmable memory preinstalled, including software that prompted forgetful users once it had learned a routine, and each possessed a character so distinctive that most users gave theirs a name. As a bonus feature, the power source neighed.

But in the fall of 1872, almost all these power units, better known as horses, came down with the flu, and America faced an energy crisis. In what became known as the Great Epizootic, horse influenza spread from Ontario down the East Coast of the United States, across the South and into the West, eventually reaching as far as California and Nicaragua. Forty-eight hours after it hit Boston, seven out of every eight of the city's horses were feverish and coughing. In "Horses at Work," Ann Norton Greene describes Philadelphia at a standstill: "Streetcar companies suspended service; undelivered freight accumulated at

wharves and railroad depots; consumers lacked milk, ice and groceries; saloons lacked beer; work halted at construction sites, brickyards and factories; and city governments curtailed fire protection and garbage collection." The disaster prompted an appreciation of the work done by horses, which had been somewhat overshadowed by the more voguish pursuit of steam power, and The Nation went so far as to publish an essay with the Matthew Arnoldian title "The Position of the Horse in Modern Society." Then as now, many had the idea that over the course of the 19th century the steam engine was fated to replace the horse. To the contrary, the Nation essayist asserted, "our dependence on the horse has grown almost pari passu with our dependence on steam."

To bolster that claim with facts is more or less the burden of Greene's book. It isn't an entirely novel thesis. Last year, in "The Horse in the City," Clay McShane and Joel A. Tarr also noted that "the steam engine actually expanded the role of the horse." Nonetheless it runs counter to the intuitions most of us have about the period, and Greene explains the paradoxical thriving of the 19th-century horse with a pleasing balance of narrative analysis and colorful detail. (McShane and Tarr's book, by comparison, offered not so much a history as a congeries of details, though some of the details were splendid, as for example the story of Louis Napoleon, the first Percheron stallion imported to America, who serviced hundreds of mares with what was said to be "perfect gentleness.")

Greene has an easy time proving her point. Between 1840 and 1910, as America was industrializing and burning more and more fossil fuels, the horse and mule population grew twice as fast as the human population. Furthermore, Greene notes, "the states with the most railroad miles also had the greatest increases in the horse population."

So why didn't steam power replace horsepower? The answer is that it did, but not in all circumstances. To cross long distances in early America, one bought a stagecoach ticket and was dragged at a speed of 10 to 12 miles an hour over rutted and uneven roads by teams of horses, one team relaying another along the route, in an experience that Frances Trollope once described as being "tossed about like a few potatoes in a wheelbarrow." Railroads improved on this, because rails were smooth and because steam-powered locomotives were more efficient than horses over distances longer than 15 miles. But horses were more efficient at start-and-stop traveling, and locomotives weren't welcome in cities, because they threw off sparks that set fires and because with some regularity they exploded. Horses therefore often pulled trains once they reached city lines. Because railroads were built by competing private companies, a passenger who wanted to change trains sometimes had to get to a depot on the other side of town. Only a horse or shank's pony could take him there. Most important, while railroads put a large number of goods and people into motion, they delivered to the depot and no further. For the last mile, animal power was the only option in the 19th century.

A slightly different synergy obtained on farms. Before industrialization, Greene writes, most farm work was done by humans, assisted by oxen. But when mass production introduced cast-iron and steel plows that cut through soil more smoothly, farmers began hitching them to horses instead of oxen, and when Obed Hussey and Cyrus McCormick invented reaping machines in the 1830s, human farmers hung up their scythes and let horsepower take care of harvesting. Soon machines were also tapping horsepower to thresh wheat and bale hay. In a similar way, once rail was laid in city streets, horses found new work drawing streetcars. "Horses urbanized 50 percent faster than humans," Greene reports. "At any time between 1860 and 1920, a Boston banker was likely to encounter more horses than would a cowboy or rancher in Colorado or Texas." By 1890, there were 12,000 railway horses in New York City. At the end of the century, they and the city's other horses were daily leaving in the city streets up to 3,300 tons of what one 19th-century scholar of horsepower politely referred to as "the rejected potential energy of incomplete chemical action." Horse-drawn streetcars stretched the potential commuting distance beyond the two miles a person could reasonably walk, enabling the wealthy to withdraw to suburbs, and they began to change streets from social spaces into conduits of travel — two ruptures in the urban fabric for which cars are usually blamed today.

In the century's last decade, the horse began to lose ground. Once Frank Sprague figured out how to electrify streetcars in 1888, streetcar companies abandoned horsepower abruptly. For a while the country's horse population continued to grow anyway, perhaps because the demand for horse-drawn freight continued to be strong. (Electric streetcars were not any better at delivering milk door-to-door than steam-powered locomotives had been.) But then horse prices dropped, discouraging breeders. Economics also seem to have brought about a qualitative decline in the work life of city horses. Formerly, teamsters had owned their horses and felt close to them. But the freighting business consolidated. By century's end, the people driving the horses were in most cases mere employees, who thought of horses as company property. As managers demanded the hauling of larger and larger loads, the employees sometimes abused the horses to satisfy them.

Humane societies had tried to protect horses for decades, and had succeeded at least in regularizing the killing of the ill and injured. (In the 1890s, New York's humane society shot as many as 7,000 a year, according to McShane and Tarr.) But as horses lost their function in the city, sentimentality took hold, and the horse's image in the popular mind split. The horse became on the one hand a sweet emissary of nature, who ought to have been frolicking in pastures rather than laboring, and on the other hand a raw beast, whose manure attracted flies and rats, and the strain of whose muscles was unsightly. In 1899, propagandists of the new horseless carriage warned that the horse was "an untamable brute which man has cowed and beaten into partial subjection, but which in revenge bursts his bonds occasionally, carrying ruin and death through our streets." They promised that the automobile, completely and mechanically subject to human control, would be cheaper and quieter, would save time, would bring about the end of traffic jams and would cause very few accidents. Of course, it didn't neigh, but you can't have everything.

Caleb Crain has written for n+1, The New Yorker and The London Review of Books.

http://www.nytimes.com/2008/11/30/books/review/Crain-t.html?8bu&emc=bua2

Cycles of Doom

By NOAM SCHEIBER

THE GREAT INFLATION AND ITS AFTERMATH

The Past and Future of American Affluence

By Robert J. Samuelson

309 pp. Random House. $26

Robert J. Samuelson is a conservative from a time when conservatism was more a sensibility than an ideology. His business columns in The Washington Post and Newsweek preach old-fashioned virtue on a macroeconomic scale: don't promise more than you can deliver; weigh the unintended consequences of your actions; beware hucksters bearing easy fixes. Samuelson often directs this advice to government officials — his nominal subjects are budget shortfalls, interest rates and energy prices. But his rules are every bit as relevant to daily life as they are to public policy.

It is therefore no surprise that Samuelson would write a book-length meditation on inflation — that ultimate symbol of cultural rot masquerading as an economic problem. Inflation-racked countries scorn all the self-abnegating rituals that make capitalism work. They want their guns and their butter and they want them now. So they print money to pay for them. By contrast, low-inflation countries are committed to an ethos of scrimping and toiling that yields long-term rewards. In "The Great Inflation and Its Aftermath," Samuelson studies the transformation of the United States from the first kind of country to the second.

The villain in Samuelson's morality tale is a group of intellectuals who came into fashion during World War II, then came into power with the Kennedy administration. John F. Kennedy himself had sound economic instincts. But he was seduced by his chief economic adviser, a University of Minnesota professor named Walter Heller, who argued that more rational management of the economy would produce permanently higher growth. "Heller was an aggressive salesman for what ultimately became known as the 'new economics,' " Samuelson writes, but he was "hardly a one-man band." Many of the day's leading economic lights — James Tobin of Yale and Robert Solow and Paul Samuelson (no relation to Robert), both of M.I.T. — held similar views.

At the heart of the "new economics" was a concept called the Phillips Curve, which summarized the trade-off between unemployment and inflation. The idea was that an economy could experience very low unemployment and high inflation, or very high unemployment and low inflation, or any combination therein. Heller persuaded Kennedy to move leftward along this spectrum by stimulating the economy — effectively accepting higher inflation in exchange for more jobs.

It worked for a time. The economy flourished; inflation inched up only marginally. But as the Kennedy administration became the Johnson administration became Nixon became Carter, growth stagnated and inflation skyrocketed. It was clear that, over the long term, the government could no more trade "a little inflation" for sustained growth than a drug addict could use "a little heroin" for a sustained high. Achieving the same economic payoff required ever more stimulus. Some presidents struggled to control their addictions, while others didn't even try. "Nixon frequently reminded Burns," Samuelson writes, referring to Arthur Burns, then the chairman of the Federal Reserve Board, "that the president's political fortunes depended heavily on the Fed's ability to increase economic growth."

What the new economists didn't realize was that inflation accelerates: workers demand raises to keep up with higher prices; companies raise prices to keep up with rising wages; the process spirals upward. The

only way to break the cycle is with a deep recession, which creates vast surpluses of goods and labor. Companies with scads of inventory eventually lower prices. High unemployment makes workers less pushy.

Which is essentially what happened in the early 1980s. Between 1980 and 1982, Paul Volcker, the Brobdingnagian Federal Reserve chairman, raised interest rates so abruptly he knocked the economy out cold. But when the nation emerged from the long, dark night, its inflation habit had been kicked. The upshot, according to Samuelson, was a quarter-century of nearly uninterrupted prosperity.

Samuelson is right to highlight inflation's central role in economic history. Beyond a certain threshold, inflation smothers growth, as people spend more time evading price increases than behaving productively. To take one example, inflation creates an impulse to spend today rather than save for tomorrow, when prices will surely be higher.

Still, Samuelson can overstate the benefits of low inflation. He claims, with little evidence, that it brought about everything from globalization to the leaner, meaner American economy of the 1990s. His causality is sometimes backward here. It's globalization that helped produce low inflation in recent decades (not, for the most part, vice versa), as cheap foreign labor undercut workers' bargaining power. Likewise, it was primarily globalization, not low inflation, that forced corporate America to shed its extra pounds. Beginning in the 1960s, American companies came under intense pressure from competitors in Europe and Japan, which eroded their profits and made their business models untenable.

But the bigger problem with Samuelson's story is that it's incomplete. Over the last decade, American policy makers — Alan Greenspan chief among them — came under the sway of the same old siren song: the belief that rational economic management could avert the pain of unemployment. And yet, the same pathologies Samuelson so shrewdly diagnoses in an earlier generation he almost completely ignores today.

In 1998, after a global financial crisis threatened the expansion he'd so carefully cultivated, Greenspan flooded the economy with cash (not crazy), then kept interest rates low for more than a year (highly questionable). The extra money led to the tech frenzy that ended so badly in 2000. Beginning in 2001, Greenspan aggressively lowered interest rates and kept them low into 2004. Once again, all the excess cash resulted in a bubble — this one in real estate — the bursting of which we're now struggling through.

Samuelson mentions these two developments in passing, but they're central to any account of inflation over the last quarter-century. The prices of stocks and homes are every bit as vulnerable to inflation as the prices of toothpaste and sandwich bread, even if government statistics properly account only for the latter pair. And as we're discovering, the consequences of that inflation are every bit as damaging.

Put simply, it makes no sense to scold Walter Heller without scolding Alan Greenspan. Why Samuelson fails to do so is unclear. Perhaps his definition of inflation is overly narrow, or he's loath to complicate his historical narrative. I favor the most charitable explanation — that he wrote most of his book before the housing bubble became evident. In which case I'll happily finish the job for him: Beware oracular Fed chairmen bearing easy fixes. h

Noam Scheiber is a senior editor at The New Republic.

http://www.nytimes.com/2008/11/30/books/review/Scheiber-t.html?8bu=&emc=bua2&pagewanted=print

Mayflower Power

By VIRGINIA HEFFERNAN

THE WORDY SHIPMATES

By Sarah Vowell

254 pp. Riverhead Books. $25.95

Sarah Vowell is a problem. She's a problem like Sarah Palin, Cyndi Lauper and Kathy Griffin. She's annoying. Or, really, she's double-annoying, because she styles herself as annoying — provocative-annoying — and if you become annoyed by her you seem to be conceding the point. She's gotten to you.

Take "The Wordy Shipmates," her fifth book. Vowell has integrated her sarcasm, flat indie-girl affect and kitsch worship — refined in print and on public radio — into a pop history of the Massachusetts Bay Colony. Known for her adenoid-helium voice, Vowell is a genial talker but an undisciplined writer. This new book mixes jiggers of various weak liquors — paraphrase, topical one-liners, blogger tics — and ends up tasting kind of festive but bad, like Long Island iced tea.

"The Wordy Shipmates" also includes a few stand-up comedy routines, plainly written to be performed. Vowell delivered one good-natured but uninspired spiel (about sitcoms that address American history) for a "This American Life" stage show. It includes a string of asides about Richie, Potsy and the gang on "Happy Days." It should not have been committed to print.

Vowell, who constantly emphasizes how nerdy (meaning impressive) she finds her own interest in the Puritans, introduces figures like John Winthrop and Roger Williams as if no one's ever heard of them. She delivers a farrago of free-floating pedantry — "the kind of smart-alecky diatribe for which I've gotten paid for 20 years" — having evidently made it her job to enlighten slacker Gen-Xers with a remedial history of our own nation.

It's not right. Vowell's whole alt-everything vibe is just dated enough to be cringey. And then there's her Great Plains accent: can something so wholesome-soundin' be real? And her politics. Perfectly early-millennium coastal (green, be good, Obama, etc.). Can she really take pleasure in plumping for an autofill ideology that's so widely shared?

Evidently she can. The book, which on one level is a chronological account of Winthrop's attempt to build an exemplary "city upon a hill," hums along with chipper personal details and relaxed talk-show-guest banter. Vowell breaks from her breezy rehash of (mostly) the work of the historian Perry Miller to supply "what's the deal with that" perceptions about Ron Paul, historical re-enactors and magazine subscription cards. She sounds as if she's enjoying herself.

But what's the deal with the rehash? These days, we have sterling academic American historians (who can hardly be said to have overlooked the Puritans, in whose intellectual tradition the study of American history — at Harvard, notably — was originally conceived). But we are also in a golden age of popular narrative history, produced not only by David McCullough and Ron Chernow and Doris Kearns Goodwin, but by PBS and the History Channel. With all these middlebrow historians making scholarly work perfectly accessible, do we really need still more accessibility — pierced-brow history, maybe, with TV and pop-music references?

The answer would seem to be no. And yet, if nothing else, "The Wordy Shipmates" finds a way to string together excerpts from Winthrop and Williams (and John Cotton and John Underhill) that keeps you reading. My experience of the book: I kept being annoyed, and I kept reading. Most of the time that she wasn't riffing or telling jokes, Vowell was merely quoting from a 17th-century sermon or pamphlet with the preface that what I was about to read was amazing or frightening. More often than not, she was right.

Throughout, Vowell can't decide what tense to use: the historical present, the past, and that weird Ken Burns "would" thing ("Cotton Mather would change America forever"). But by book's end she's got you cornered. Just as you're thinking, O.K., the history of the Massachusetts Bay Colony is worth retelling, but could you turn down the hipster stuff, Vowell manages to align herself squarely with the great American dissident and feminist Anne Hutchinson. Rats! Once again, Vowell gets to be the abrasive wild card. She's annoying and uppity, and the book has made the case for being annoying and uppity. She's won.

Vowell may not be Anne Hutchinson (hey, did you know that Hutchinson had 15 children?), but she's a legitimate upstart. After all, having grown up a part-Cherokee Pentecostalist, she has somehow managed to become the one and only Sarah Vowell: a respected social commentator, a public radio star, the voice of Violet in "The Incredibles" and the author of five untrivial books, all while befriending (the tour-de-force acknowledgments section suggests) J. J. Abrams, Dave Eggers, Jake Gyllenhaal, Spike Jonze, Greil Marcus, David Sedaris and Zadie Smith.

How impressive. How annoying.

Virginia Heffernan writes The Medium, a column about digital culture, for The New York Times Magazine.

http://www.nytimes.com/2008/11/30/books/review/Heffernan-t.html?8bu&emc=bua2

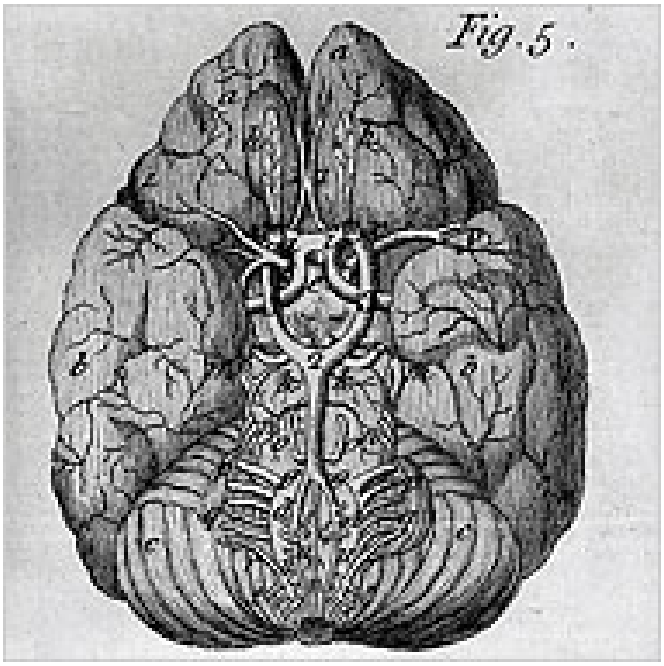
Annals of Malpractice

By FRANCESCA MARI

DOCTOR OLAF VAN SCHULER'S BRAIN

By Kirsten Menger-Anderson

290 pp. Algonquin Books of Chapel Hill. $22.95



Of all the service providers ever evaluated by Consumer Reports, doctors receive among the highest ratings. People, the magazine concluded, actually like going to the doctor: they like the bestowal of paper robes and the perfunctory poking! In a survey of more than 39,000 patients, an overwhelming majority said they were "highly satisfied . . . and got better." This overweening confidence, despite medicine's many missteps and harrowing history, pulses through Kirsten Menger-Anderson's first story collection. Beginning in 1662, shortly after the secular reconception of madness as a disease rather than a moral pock, "Doctor Olaf van Schuler's Brain" opens with said Olaf, fresh to New Amsterdam from Holland, and leapfrogs down a long lineage of doctors — almost a dozen generations speckled with mental instability.

In spite of their crazy convictions — that a drunk could spontaneously combust; that a garlic wrap might resurrect a corpse — the family's faith in medicine persists like a hibernating herpes virus. In the early 1800s, one doctor forbids his daughter from working to reform prisons, then attributes her ensuing depression to a self-polluting, wandering womb — one that only a fattening fetus could weight back down. As an adult she satiates herself with phrenology, willfully reading retribution into the curves of her father's cranium. Around the same time, her brother, a doctor cloaked in a rich man's coat of many colors, stands on the city docks invoking animal magnetism to whip crowds into a hypnotic frenzy. Replacing animal magnetism with the magneto, the doctor of the next generation electrocutes a patient. His son takes the liberty of lobotomizing his insane artist sister. Having lost her drive to paint, she drools for three months before dropping dead. And at this point, there's almost 100 years to go.

The book's sheer scope and enormous cast mean that characters frequently feel like whimsical apparitions. But despite their slightness, they aren't simply mercenaries in satire's war. Menger-Anderson does indulge in some lighthearted silicone spoofing — when one character decides to buy breast implants, "her uncle said they lasted forever. If a mother wanted to, she could will them to her children" — but her tone throughout is refreshingly entertained rather than embittered. Like a benevolent aunt, she takes joy in her subjects, poking them in the sides rather than slicing them down to size.

Science is an elixir that sweeps these characters under its spell. Yet the pace of Menger-Anderson's book is driven as much, if not more, by the reader's romantic appetite — by an itch to discover how each story is romantically resolved and connected to the long lineage. The bloodline isn't just structural reinforcement. Refracting the evolution of medicine through the filter of a family's conflicts reminds us of the human holding the stethoscope. Doctors aren't always right. Historically, most have been wrong. And yet an inspiring final story featuring a rankled, ailing father and his distant, studious daughter — the most fraught and realistically rendered of the collection — emotionally endorses their imperfect endeavor.

Fortunately the most time-honored treatment happens to be the best. Time and again, Menger-Anderson's doctors heal, or at least alleviate, through their charisma and confidence, a placebo's active ingredients. Their faith in science drives them to take control of a situation, to treat it, by turning it into a story — a little dry, maybe, and insistent on foreshadowing and clear causality. But improbable as the doctors' plots may sometimes be, their patients appreciate these narrative attempts at order — and often feel better because of them.

Francesca Mari has written for The New Republic, The San Francisco Chronicle and other publications.

http://www.nytimes.com/2008/11/30/books/review/Mari-t.html?8bu&emc=bua2

The Well-Tended Bookshelf

By LAURA MILLER

In order to have the walls of my diminutive apartment scraped and repainted, I recently had to heap all of my possessions in the center of the room. The biggest obstacle was my library. Despite what I like to think of as a rigorous "one book in, one book out" policy, it had begun to metastasize quietly in corners, with volumes squeezed on top of the taller cabinets and in the horizontal crannies left above the spines of books that had been properly shelved. It was time to cull.

I am not a collector or a pack rat, unlike a colleague of mine who once expressed the fear that he might perish someday under a toppled pile of books and papers, like a woman whose obituary he once read. I was baffled the first time a friend explained to me that the book in my hand was his "reading copy," while the "collection copy" resided upstairs, in some impenetrable sanctum. Having reviewed hundreds of books over the past 20-some years, I no longer subscribe to the notion that I have a vague journalistic responsibility to keep a copy of every title I have ever written about. I am not sentimental.

Nevertheless, things had gotten out of hand. The renovations forced me to pull every copy off every shelf and ask: Do I really want this? I filled four or five cartons with volumes destined for libraries, used-book stores and the recycling bin, and as I did so, certain criteria emerged.

There are two general schools of thought on which books to keep, as I learned once I began swapping stories with friends and acquaintances. The first views the bookshelf as a self-portrait, a reflection of the owner's intellect, imagination, taste and accomplishments. "I've read 'The Magic Mountain,' " it says, and "I love Alice Munro." For others, especially those with literary careers, a personal library can be "emotional and totemic," in the words of the agent Ira Silverberg. Books become stand-ins for friends and clients. Silverberg cherishes the copy of Céline given to him when he was 19 by William Burroughs, while "people I've stopped talking to go out immediately. There are people whose books I refuse to live with."

The other approach views a book collection less as a testimony to the past than as a repository for the future; it's where you put the books you intend to read. "I like to keep something on my shelf for every mood that might strike," said Marisa Bowe, a nonprofit consultant and an editor of "Gig: Americans Talk About Their Jobs." At its most pragmatic, and with the aid of technology, this attitude can be breathtakingly ruthless. Lisa Palac, a freelance writer, and Andrew Rice, a public relations executive, ultimately chose their beloved but snug house in Venice, Calif., over their library. "We'd been lugging these books around for years, and why?" Palac wrote in an e-mail message. Her husband said, "Do we really need to keep that copy of 'The Scarlet Letter' from college on hand? I can order up another copy online and have it tomorrow if I need it." They kept only one carton of books apiece, donating the rest to a fund-raising bazaar for their son's school.

Older people, curiously enough, seem to favor the less nostalgic approach. When you're young and still constructing an identity, the physical emblems of your inner life appear more essential, and if you're

single, your bookshelves provide a way of advertising your discernment to potential mates. I've met readers who have jettisoned whole categories of titles — theology, say, or poststructuralist theory — that they once considered desperately important. Most of them express no regrets, although Nicholson Baker, who wrote an entire book protesting the "weeding" of books and periodicals from American libraries, still mourns the collection of science fiction paperbacks he discarded in his youth. "I'm not good at it," Baker wrote in an e-mail message when asked about his own culling. "When I'm doing research, I buy lots of used, out-of-print books, preferably with underlining and torn covers. I like watching them pile up on the stairs."

For the most part, I've been pragmatic in my purging, and for years reference books were the most likely survivors. I needed them for work, for those occasions when I suddenly had to know at what age Faulkner published "Absalom, Absalom" (39) or the name of the Greek muse of lyric poetry (Euterpe). Now the Internet can tell me all that. Apart from the rare reference that's worth reading in its own right, like David Thomson's Biographical Dictionary of Film, these titles have been drifting away as the trust I'm willing to put in Wikipedia gradually equalizes with the faith I've invested in, say, Benet's Reader's Encyclopedia. (It doesn't help that reference books tend to be shelf hogs.)

Nevertheless, most of the nonfiction I've kept consists of books I've already read and know I'm likely to refer to in my own writing. Richard Holmes's biography of Coleridge has come in handy for more than one project, as has Carol J. Clover's study of slasher films, "Men, Women, and Chainsaws." In fiction, on the other hand, apart from a few choice favorites, the list is weighted toward classics I optimistically plan to get around to someday. Like John Irving, I hold one substantial unread Dickens novel ("Barnaby Rudge") in reserve, for emergencies. This method has its pitfalls. The novelist Jonathan Franzen used to limit the unread books on his shelves to no more than 50 percent of the total. "The weight of those books seemed to represent a standing reproach to me of how little I was reading," he said in a phone interview. "I want to be surrounded by books I love, although now sometimes I worry that it's too familiar, what I see when I look around me, that it's become a sort of narcissistic mirror."

When it comes to novels, I'm probably too sanguine about what my future can accommodate. "Eventually the truth hits home," Brian Drolet, a television producer in New York, told me. "As the actuarial tables advance, the number of books you've got time to read diminishes." Dr. Johnson once said of second marriages that they represent the triumph of hope over experience. So, too, do my bookshelves. I have turned out to be less rational about this than I thought, and have made my library into a charm against mortality. As long as I have a few unread books beckoning to me from across the room, I tell myself I can always find a little more time.

Laura Miller is a staff writer for Salon and the author of "The Magician's Book: A Skeptic's Adventures in Narnia," which has just been published.

http://www.nytimes.com/2008/11/30/books/review/Miller-t.html?8bu&emc=bub1

Virtual Ears And The Cocktail Party Effect

The 'cocktail party effect' describes how our brains develop the ability to focus on particular sounds among a background of noise. (Credit: iStockphoto/Cat London)

ScienceDaily (Nov. 29, 2008) — Oxford University research has helped understanding of the so-called 'cocktail party effect' – how our brains develop the ability to pinpoint and focus on particular sounds among a background of noise.

The study, published in the Journal of Neuroscience, has implications for the emergence of hearing abilities in children and for restoring hearing after fitting hearing aids and cochlear implants.

Humans begin to develop their hearing at a very early stage. Even a 28 week old foetus will respond to sound, and newborn infants can distinguish different types of speech sound. Our hearing continues to develop throughout childhood, including the ability to distinguish between sounds coming from different directions and to understand speech in difficult acoustic environments, such as a busy room with many echoes.

Nerve cells in the superior colliculus, one of the brain regions responsible for processing sound, mature during infancy, gradually developing a preference for specific sound directions. Which of these nerve cells are active therefore signals where sounds are located, forming an auditory map of the environment.

Researchers led by Professor Andrew King, a Wellcome Trust Principal Research Fellow at the University of Oxford, have developed a method that enables the changes in the selectivity of the nerve cells for different directions of space to be to separated out from the development of the auditory map.

The technique, used on ferrets, involves using 'virtual ears' which can enable an infant ferret to hear sounds as if it were an adult.

The researchers in the Department of Physiology, Anatomy and Genetics placed tiny microphones inside the opening of the ears of adult ferrets to capture the sound as modulated by an adult head. This sound, when played back over headphones to an infant ferret, appears to be coming from outside the ferret's head, but mimics what an adult would hear.

By measuring the responses of nerve cells in the brain, the researchers were able to see how the infant brain differs from the adult and to show that the development of the selectivity of the nerve cells for sound location and their assembly into the auditory map are influenced by independent factors.

"Our research showed that the region of space to which the nerve cells respond is determined by the shape of the ferret's ears and their distance apart, both of which change with age," says Professor King. "On the other hand, the gradual development of the auditory map is influenced by the experience of the sounds that are heard."

Professor King believes that this has implications for a child's ability to learn how to hear after a hearing aid or cochlear implant has been fitted. Other work from this group has shown that even the adult brain is remarkably able to adapt.

"We have shown that the neural circuits of our hearing apparatus can adjust to a loss of hearing in one ear," says Professor King. "Clearly, the adult brain is still plastic and able to adapt, so fitting hearing aids and cochlear implants in adults is worthwhile."

The research was funded by the Wellcome Trust, the Lister Institute for Preventive Medicine and the Biotechnology and Biological Sciences Research Council.

Adapted from materials provided by University of Oxford.

http://www.sciencedaily.com/releases/2008/11/081119175851.htm

Bad Cholesterol Inhibits The Breakdown Of Peripheral Fat

ScienceDaily (Nov. 29, 2008) — The so called bad cholesterol (LDL) inhibits the breakdown of fat in cells of peripheral deposits, according to a study from the Swedish medical university Karolinska Institutet. The discovery reveals a novel function of LDL as a regulator of fat turnover besides its well-established detrimental effects in promoting atherosclerosis.

The study is a collaboration of two research groups at Karolinska Institutet. It shows that LDL cholesterol slows the rate of fat breakdown (i.e. lipolysis) in adipocytes, the peripheral cells responsible for fat storage. Previously, it has been known that release of free fatty acid from the peripheral fat to the blood stream increases the synthesis of LDL precursors in the liver.

“The results of our study provide evidence of a reciprocal link between the liver and peripheral fat regulating fat turnover”, says study-initiator Dr Johan Björkegren.

The discovery also opens up for new theories for the well-established association between blood lipids and the metabolic syndrome.

“If proven of general physiological importance, therapies lowering LDL, as for instances Statins, may also affect the turnover of peripheral fat,” continues Dr Björkegren.

The study and has been performed on cell cultures and tissues from humans as well as mouse models with different levels of LDL. The inhibitory effect was also shown to be dependent on LDL receptors on the surface of the fat cells.

“The exact intracellular mechanism for how the binding of LDL to the surface of the fat cells inhibits the breakdown of intracellular fat remains to be revealed”, say project leader Dr Josefin Skogsberg.

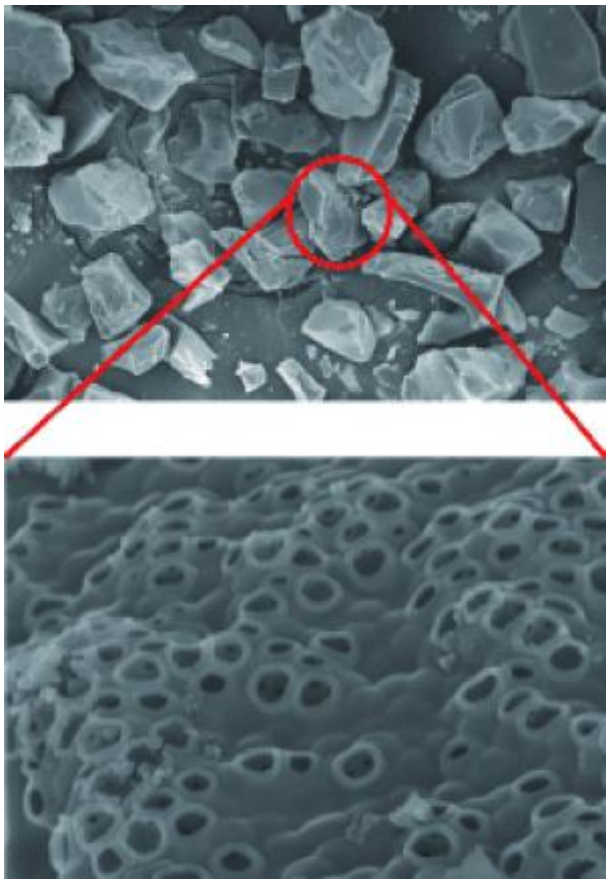
Journal reference:

1. Skogsberg et al. **ApoB100-LDL Acts as a Metabolic Signal from Liver to Peripheral Fat Causing Inhibition of Lipolysis in Adipocytes**. *PLoS ONE*, 2008; 3 (11): e3771 DOI: 10.1371/journal.pone.0003771

Adapted from materials provided by Karolinska Institutet.

http://www.sciencedaily.com/releases/2008/11/081120073117.htm

Highly Efficient Lithium Batteries Could Greatly Extend Battery Life Of Laptop Computers



Anodes made of highly porous silicon have a high charge capacity for lithium ions. (Credit: Copyright Wiley-VCH)

ScienceDaily (Nov. 29, 2008) — Rechargeable lithium ion batteries provide portable devices that require a lot of energy, such as mobile telephones, digital cameras, and notebook computers, with power. However, their capacity, and thus the running time of the devices, remain somewhat limited. A notebook computer thus usually runs only about two hours.

The reason for this is the relatively small capacity of the graphite anode in these batteries to absorb lithium ions. A team led by Jaephil Cho at Hanyang University in Korea has now developed a new material for anodes, which could clear a path for a new generation of rechargeable batteries. As reported in the journal Angewandte Chemie, their new material involves three-dimensional, highly porous silicon structures.

Lithium ion accumulator batteries produce current by moving lithium ions. The battery usually contains a cathode (positive electrode) made of a mixed metal oxide, such as lithium cobalt oxide, and an anode (negative electrode) made of graphite. While the battery is being charged, lithium ions migrate into the anode, where they are stored between the graphite layers. When the battery is being discharged, these ions migrate back to the cathode.

It would be nice to have an anodic material that could store more lithium ions than graphite. Silicon presents an interesting alternative. The problem: silicon expands a great deal while absorbing lithium ions (charging) and shrinks when giving them up (discharging). After several cycles the required thin silicon layers are pulverized and can no longer be charged.

Cho's team has now developed a new method for the production of a porous silicon anode that can withstand this strain. They annealed silicon dioxide nanoparticles with silicon particles whose outermost silicon atoms have short hydrocarbon chains attached to them at 900 °C under an argon atmosphere. The silicon dioxide particles were removed from the resulting mass by etching. What remained were carbon-coated silicon crystals in a continuous, three-dimensional, highly porous structure.

Anodes made of this highly porous silicon have a high charge capacity for lithium ions. In addition, the lithium ions are rapidly transported and stored, making rapid charging and discharging possible. A high specific capacity is also attained with high current. The changes in volume that occur upon charging and discharging cause only a small degree of swelling and shrinking of the pore walls, which have a thickness of less than 70 nm.

In addition, the first charging cycle results in an amorphous (noncrystalline) silicon mass around residual nanocrystals in the pore walls. Consequently, even after 100 cycles, the stress in the pore wall is not noticeable in the material.

Journal reference:

1. . **Three-Dimensional Porous Silicon Particles for Use in High-Performance Lithium Secondary Batteries**. *Angewandte Chemie International Edition*, DOI: 10.1002/anie.200804355

Adapted from materials provided by Wiley-Blackwell.

http://www.sciencedaily.com/releases/2008/11/081120103802.htm

Ban On Fast Food TV Advertising Would Reverse Childhood Obesity Trends, Study Shows

A ban on fast food advertisements in the United States could reduce the number of overweight children by as much as 18 percent, according to a new study. (Credit: iStockphoto/Carmen Martínez Banús)

ScienceDaily (Nov. 29, 2008) — A ban on fast food advertisements in the United States could reduce the number of overweight children by as much as 18 percent, according to a new study being published this month in the Journal of Law and Economics. The study also reports that eliminating the tax deductibility associated with television advertising would result in a reduction of childhood obesity, though in smaller numbers.

The study was conducted by researchers from the National Bureau of Economic Research (NBER) with funding from the National Institutes of Health. NBER economists Shin-Yi Chou of Lehigh University, Inas Rashad of Georgia State University, and Michael Grossman of City University of New York Graduate Center co-authored the paper, which measures the number of hours of fast food television advertising messages viewed by children on a weekly basis.

The authors found that a ban on fast food television advertisements during children's programming would reduce the number of overweight children ages 3-11 by 18 percent, while also lowering the number of overweight adolescents ages 12-18 by 14 percent. The effect is more pronounced for males than females.

Though a ban would be effective, the authors also question whether such a high degree of government involvement—and the costs of implementing such policies—is a practical option. Should the U.S. pursue that path, they would follow Sweden, Norway and Finland as the only countries to have banned commercial sponsorship of children's programs.

"We have known for some time that childhood obesity has gripped our culture, but little empirical research has been done that identifies television advertising as a possible cause," says Chou, the Frank L. Magee Distinguished Professor at Lehigh's College of Business and Economics. "Hopefully, this line of research can lead to a serious discussion about the type of policies that can curb America's obesity epidemic."

The study also found that the elimination of tax deductibility tied to advertising would similarly produce declines in childhood obesity, albeit at a smaller rate of 5-7 percent. Advertising is considered a business expense and, as such, it can be used to reduce a company's taxable income. The authors deduce that, since the corporate income tax rate is 35 percent, the elimination of the tax deductibility of food advertising costs would be equivalent to increasing the price of advertising by 54 percent.

Such an action would consequently result in the reduction of fast food advertising messages by 40 percent for children, and 33 percent for adolescents.

The study—the largest of its kind to directly tie childhood obesity to fast food advertising on American television—is based on the viewing habits of nearly 13,000 children using data from the 1979 Child-Young Adult National Longitudinal Survey of Youth and the 1997 National Longitudinal Survey of Youth, both issued by the U.S. Department of Labor.

A 2006 report issued by the Institute of Medicine indicated there is compelling evidence linking food advertising on television and increased childhood obesity. "Some members of the committee that wrote the report recommended congressional regulation of television food advertisements aimed at children, but the report also said that the final link that would definitively prove that children had become fatter by watching food commercials aimed at them cannot be made," says Grossman.

"Our study provides evidence of that link," he says.

The Centers for Disease Control estimate that, between 1970 and 1999, the percentage of overweight children ages 6-11 more than tripled to 13 percent. Adolescents between the ages of 12 and 19 also saw a significant increase, reaching 14 percent.

Research indicates that there is an 80 percent chance an overweight adolescent will be an obese adult and that over 300,000 deaths can be attributed to obesity and weight in the United States every year.

Adapted from materials provided by Lehigh University.

http://www.sciencedaily.com/releases/2008/11/081119120149.htm

New Screening Halves Number Of Children Born With Down Syndrome

ScienceDaily (Nov. 29, 2008) — A new national screening strategy in Denmark has halved the number of infants born with Down's syndrome and increased the number of infants diagnosed before birth by 30%, according to a study published on the British Medical Journal.

Many countries, including England, Australia and New Zealand, are trying to introduce national screening strategies for Down's syndrome, but are facing a variety of problems because of a lack of consensus about the screening policy and logistical challenges.

In 2004, the Danish National Board of Health issued new guidelines for prenatal screening and diagnosis. These included the offer of a combined test for Down's syndrome (based on combination of maternal age, plus serum and nuchal screening) in the first trimester. This test gave women a risk assessment for Down's syndrome at an early stage in the pregnancy. Women whose risk was higher than a defined cut off were referred for invasive diagnostic tests (chorionic villus sampling or amniocentesis).

In the previous guidelines screening for Down's syndrome was based on maternal age and a diagnostic test was mainly offered to women above 35 years.

Professor Ann Tabor and colleagues from Denmark, evaluated the impact of the new national screening strategy on the number of infants born with Down's syndrome and the number of referrals for invasive procedures. They analysed data from the 19 Danish departments of gynaecology and obstetrics and the national cytogenetic registry, for an average of 65,000 births each year, between 2000 and 2007.

Uptake was good, by June 2006 all 15 Danish counties followed the guidelines from 2004 and offered the new screening strategy. In 2006 approximately 84% of pregnant women had a risk assessment for Down's syndrome.

The researchers found that the new strategy was associated with improved earlier detection of Down's syndrome, low false positive rates, and more than a 50% decrease in the number of invasive tests carried out each year.

They report that the number of infants born with Down's syndrome decreased from 55󈞭 per year during 2000 , to 31 in 2005 and 32 in 2006. The total number of invasive tests fell sharply from 7524 in 2000 to 3510 in 2006.

The detection rate in the screened population was 86% in 2005 and 93% in 2006. With 3.9% (17) of women receiving a false positive result in 2005 and 3.3% (7) in 2006.

The authors point out that the value of this new screening strategy is that all women can be assessed early in pregnancy (in the first trimester). The national guidelines emphasise that risk assessment should only be done if women choose the test on the basis of informed choice, therefore despite the programme being available to all pregnant in women in Denmark, some will still choose not to be screened.

The authors conclude by emphasising Denmark's success at building a strong national organisation for fetal medicine and a national quality database that allows follow-up of all screened women at a national level and quality control of the new national screening programme.

Adapted from materials provided by BMJ-British Medical Journal, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081127204346.htm

Spinning Into The Future Of Data Storage

From left to right: Dr. Alan Drew, Dr. Andreas Suter and Dr. Elvezio Morenzoni using the Low Energy Muon equipment. (Credit: Copyright 2008 Dr Alan Drew)

ScienceDaily (Nov. 29, 2008) — Scientists from Queen Mary, University of London have improved their understanding of the inner workings of our computers and MP3 players, thanks to an exciting new field of research called 'organic spintronics'.

Dr Alan Drew from Queen Mary's Department of Physics and the University of Freiburg, Switzerland, along with colleagues from the Paul Scherrer Institute (PSI), Switzerland, has become the first to measure how the magnetic polarisation is lost in a device similar to a hard drive 'read-head' found in every computer produced in the last ten years.

Computers and MP3 players have become increasingly efficient at information storage thanks to an effect that physicists call 'giant magnetoresistance'; this allows scientists to produce electronic components which are very sensitive to external magnetic fields, known as magnetic read-heads. These read-heads allow magnetically-encoded data to be very densely packed, resulting in very small hard drives which can store more than 100 CDs worth of data in a device the size of half a cigarette box.

Unlike most electronic components, where the electron's intrinsic electric field or charge is used to carry a signal, magnetic read-heads use the electron's intrinsic magnetic field - known as their 'spin' - to carry information. Spinvalves are made up of at least three layers, two magnetic layers separated by a non-magnetic layer. Dr Drew and his team wanted to investigate how spins travel across the middle of these three layers, in the hope of improving future generations of data storage.

His findings contribute significantly to the fundamental understanding of spintronic devices, and will allow new concepts to develop and aid in the discovery of novel devices and applications, as Dr Drew explains: "Spintronics promise low-power circuits, possibly at the quantum level, and the possibility of combining communication, memory and logic on the same chip. The efficient transfer of spin in these devices remains one of the most difficult challenges facing physicists. One way of improving the

efficiency of these devices could be to change the materials they are made from, but currently we are unable to predict what effects the different materials will have. Dr Drew's measurements hope to address this.

One particularly exciting part of this research is that a new combination of materials was used to make the device. Dr Drew continues "When devices are made from organic materials, which have low manufacturing costs and are very flexible, the magnetic information can be preserved for extremely long times – over a million times longer than many materials used in today's technology. These new materials have the potential to create an entirely new generation of spin-enabled devices."

Writing in the journal Nature Materials, Dr Drew explains how the researchers used muons, elementary particles that act like tiny magnets, to measure the magnetic field within the device. As Dr Morenzoni from PSI explains, "The muons have a high energy and must be slowed down before they can be used in the experiment and the equipment we used to do this is unique – PSI is the only source of 'slow' muons in the world, and the only equipment that can measure depth resolved magnetism."

In the long-run, experiments such as this will help understand the fundamental operation of spintronics and hard drive read-heads, and will help to show engineers how they can optimise the heads, and improve computer storage, vital to the next generation of technology.

The project was a Swiss-British collaboration, including Queen Mary, University of London; University of Fribourg; ISIS Facility Rutherford Appleton Laboratory; University of Sheffield and the Paul Scherrer Institute, Switzerland.

Journal reference:

1. Drew et al. **Direct measurement of the electronic spin diffusion length in a fully functional organic spin valve by low-energy muon spin rotation**. *Nature Materials*, 2008; DOI: 10.1038/nmat2333

Adapted from materials provided by Queen Mary, University of London.

http://www.sciencedaily.com/releases/2008/11/081124102710.htm

Making Gases More Transportable: Methane Gas Converted To Powder Form

ScienceDaily (Nov. 29, 2008) — Chemists at the University of Liverpool have developed a way of converting methane gas into a powder form in order to make it more transportable.

Scientists have developed a material made out of a mixture of silica and water which can soak up large quantities of methane molecules. The material looks and acts like a fine white powder which, if developed for industrial use, might be easily transported or used as a vehicle fuel.

Methane is the principal component of natural gas and can be burnt in oxygen to produce carbon dioxide and water. The abundance of the gas and its relatively clean burning process makes it a good source of fuel, but due to its gaseous state at room temperature, methane is difficult to transport from its source.

Professor Andy Cooper, Director of the Centre for Materials Discovery at the University's Department of Chemistry, explains: "Many natural gas reserves are geographically remote and can only be extracted via pipelines, so there is a need to look for other ways to transport the gas. It has been suggested that methane gas hydrate could be used as a way of containing methane gas for transportation. The disadvantage of methane gas hydrate for industry use is that it is formed at a very slow rate when methane reacts with water under pressure.

"To counteract these difficulties we used a method to break water up into tiny droplets to increase the surface area in contact with the gas. We did this by mixing water with a special form of silica – a similar material to sand – which stops the water droplets from coalescing. This 'dry water' powder soaks up large quantities of methane quite rapidly at around water's normal freezing point."

The team also found that 'dry water' could be more economical than other potential products because it is made from cheap raw materials. The material may also have industrial applications if methane could be stored more conveniently and used to power clean vehicles.

Chemists at Liverpool are now investigating ways to store larger quantities of methane gas at higher temperatures and lower pressures as part of a project funded by the UK Engineering and Physical Sciences Research Council (EPSRC).

Adapted from materials provided by University of Liverpool, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081120073126.htm

Global Warming Is Changing Organic Matter In Soil: Atmosphere Could Change As A Result

Global warming actually changes the molecular structure of organic matter in soil, new research suggests. (Credit: iStockphoto/René Mansi)

ScienceDaily (Nov. 28, 2008) — New research shows that we should be looking to the ground, not the sky, to see where climate change could have its most perilous impact on life on Earth.

Scientists at the University of Toronto Scarborough have published research findings in the journal Nature Geoscience that show global warming actually changes the molecular structure of organic matter in soil.

"Soil contains more than twice the amount of carbon than does the atmosphere, yet, until now, scientists haven't examined this significant carbon pool closely," says Myrna J. Simpson, principal investigator and Associate Professor of Environmental Chemistry at UTSC. "Through our research, we've sought to determine what soils are made up of at the molecular level and whether this composition will change in a warmer world."

Soil organic matter is what makes dirt fertile and able to support plant life – both of which are especially important for agriculture. Organic matter retains water in the soil and prevents erosion. Natural processes of decomposition of soil organic matter provide plants and microbes with the energy source and water they need to grow, and carbon is released into the atmosphere as a by-product of this process. Warming temperatures are expected to speed up this process which will increase the amount of CO2 that is transferred to the atmosphere.

"From the perspective of agriculture, we can't afford to lose carbon from the soil because it will change soil fertility and enhance erosion" says Simpson. "Alternatively, consider all the carbon locked up in permafrost in the Arctic. We also need to understand what will happen to the stored carbon when microbes become more active under warmer temperatures."

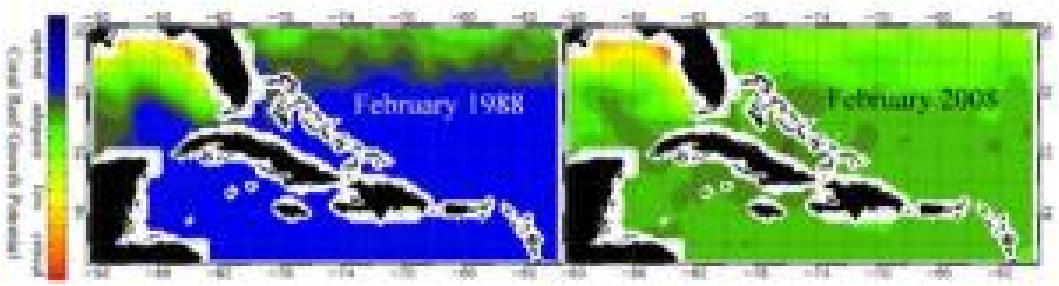
Until Simpson's research, scientists didn't know much about soil's molecular composition. Part of the reason is that, from a chemical perspective, soil is difficult to analyze due to its many components, including bacteria, fungi and an array of fresh, partially degraded, or old plant material. Simpson's team, which includes research collaborators Professors Dudley Williams and Andre Simpson, is uniquely positioned to address this new frontier. The team uses a NMR (Nuclear Magnetic Resonance) facility - the only NMR facility in Canada specifically dedicated to environmental research – to gain a detailed view of soil's molecular structure and reactivity.

In their current study, Simpson's team used an outdoor field experiment in the valley behind the UTSC campus to ensure natural ecosystem processes were preserved. Electrodes warmed the test soil between three and six degrees through winter and summer seasons, over a 14-month period. Throughout the test period, the team analyzed the molecular composition of soil samples.

Adapted from materials provided by University of Toronto.

http://www.sciencedaily.com/releases/2008/11/081124130948.htm

Ocean Acidification In The Caribbean Significant, Yet Variable



The potential for coral growth in the Caribbean region is dramatically changing due to ocean acidification. (Credit: NOAA)

ScienceDaily (Nov. 28, 2008) — A new study, which confirms significant ocean acidification across much of the Caribbean and Gulf of Mexico, reports strong natural variations in ocean chemistry in some parts of the Caribbean that could affect the way reefs respond to future ocean acidification.Such short-term variability has often been underappreciated and may prove an important consideration when predicting the long-term impacts of ocean acidification to coral reefs. Conducted by scientists from NOAA and the University of Miami's Rosenstiel School of Marine and Atmospheric Science, the study was published in the Oct. 31, 2008 issue of the Journal of Geophysical Research – Oceans.

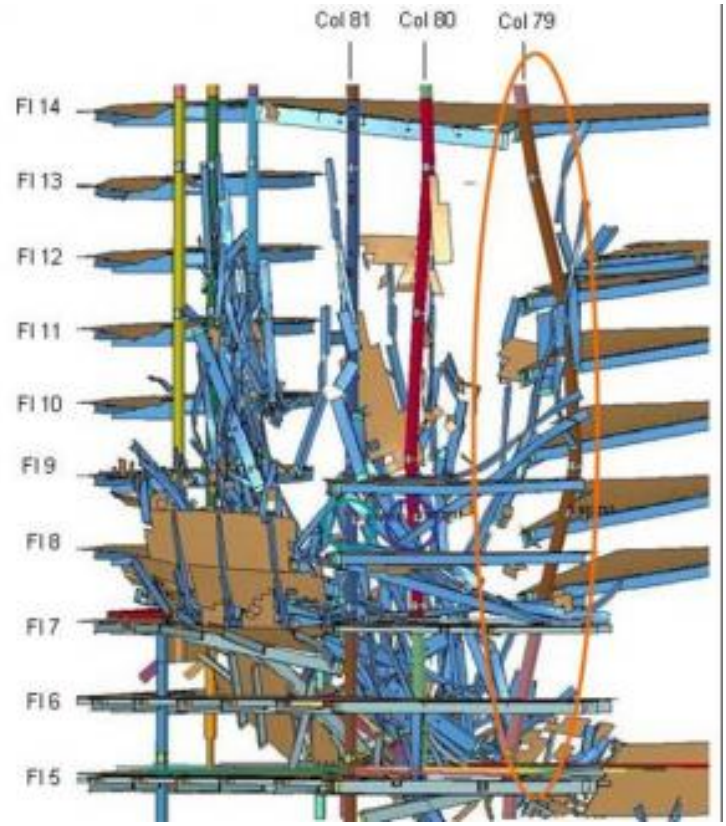
Previous NOAA studies have shown that a quarter of the carbon dioxide that humans place in the atmosphere each year ends up being dissolved into the ocean. The result is the ocean becomes more acidic, making it harder for corals, clams, oysters, and other marine life to build their skeletons or shells. A number of recent studies demonstrate that ocean acidification is likely to harm coral reefs by slowing coral growth and making reefs more vulnerable to erosion and storms.In the new study, NOAA scientists used four years of ocean chemistry measurements taken aboard the Royal Caribbean Cruise Line ship Explorer of the Seas together with daily satellite observations to estimate changes in ocean chemistry over the past two decades in the Caribbean region. The resulting new ocean acidification tracking products are available online along with animations of the changes since 1988."Ocean acidification has become an important issue to coral reef managers and researchers," said Tim Keeney, deputy assistant secretary for oceans and atmosphere and co-chair of the United States Coral Reef Task Force. "These new tools provide these communities with better information to guide future research. This is the first time that anyone has been able to track ocean acidification on a monthly basis."

The study supports other findings that ocean acidification is likely to reduce coral reef growth to critical levels before the end of this century unless humans significantly reduce carbon dioxide emissions. While ocean chemistry across the region is currently deemed adequate to support coral reefs, it is rapidly changing as atmospheric carbon dioxide levels rise."The study demonstrates a strong natural seasonal variability in ocean chemistry in waters around the Florida Keys that could have important consequences for how these reefs respond to future ocean acidification," says NOAA's Dwight Gledhill, Ph.D., lead author of the study.C. Mark Eakin, Ph.D., coordinator of NOAA's Coral Reef Watch, said "Organisms from highly variable environments are often better adapted to changes like we have seen in the last 20 years. The real question is how far corals can adapt and if this natural variability will be enough to protect them."Co-authors of the paper are Rik Wanninkhof, Ph. D., NOAA Research's Atlantic Oceanographic and Meteorological Laboratory, Frank J. Millero, Ph. D, University of Miami's Rosensteil School of Marine and Atmospheric Science, and Eakin, NOAA National Satellite and Information Service's Coral Reef Watch.

Adapted from materials provided by National Oceanic And Atmospheric Administration.

http://www.sciencedaily.com/releases/2008/11/081121163353.htm

Final World Trade Center 7 Investigation Report On September 11, 2001 Collapse Released



Graphic showing the buckling of WTC 7 Column 79 (circled area), the local failure identified as the initiating event in the building's progressive collapse. (Credit: NIST Building and Fire Research Laboratory)

ScienceDaily (Nov. 28, 2008) — The National Institute of Standards and Technology (NIST) today released its final report on the Sept. 11, 2001, collapse of the 47-story World Trade Center building 7 (WTC 7) in New York City. The final report is strengthened by clarifications and supplemental text suggested by organizations and individuals worldwide in response to the draft WTC 7 report, released for public comment on Aug. 21, but the revisions did not alter the investigation team's major findings and recommendations, which include identification of fire as the primary cause for the building's failure.

The extensive three-year scientific and technical building and fire safety investigation found that the fires on multiple floors in WTC 7, which were uncontrolled but otherwise similar to fires experienced in other tall buildings, caused an extraordinary event. Heating of floor beams and girders caused a critical support column to fail, initiating a fire-induced progressive collapse that brought the building down.

In response to comments from the building community, NIST conducted an additional computer analysis. The goal was to see if the loss of WTC 7's Column 79—the structural component identified as the one whose failure on 9/11 started the progressive collapse—would still have led to a complete loss of the building if fire or damage from the falling debris of the nearby WTC 1 tower were not factors. The investigation team concluded that the column's failure under any circumstance would have initiated the destructive sequence of events.

Other revisions to the final WTC 7 report included:

- Expanding the discussion of firestopping, the material placed between floors to prevent floor-to-floor fire spread;
- Clarifying the description of thermal expansion as it related to WTC 7's shear studs and floor beams; and
- Explaining in greater detail the computer modeling approach used to define where and when the fire in WTC 7 started and the extent of window breakage as a result of fire.

With the release of the final WTC 7 report, NIST has completed its federal building and fire safety investigation of the WTC disaster that began in August 2002. A three-year study of the collapses of the WTC towers (WTC 1 and 2) was completed in October 2005. More than 20 changes in the U.S. model building and fire codes have already been adopted based on the findings and recommendations from the investigation.

NIST will now work with various public and private groups toward implementing additional changes to the U.S. model building and fire codes including those based on the 13 recommendations from the WTC 7 report (one new and 12 reiterated from the towers investigation).

The complete text of the final WTC 7 report, and a video describing the WTC 7 investigation findings are available on the NIST website.

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

http://www.sciencedaily.com/releases/2008/11/081120144246.htm

Secret To Workplace Happiness? Remember What You Love About The Job, Study Urges

ScienceDaily (Nov. 28, 2008) — Urging employees to simply rethink their jobs was enough to drop absenteeism by 60 per cent and turnover by 75 per cent, a new University of Alberta study shows.

A 'Spirit at Work' intervention program, designed to engage employees and give a sense of purpose, significantly boosted morale and job retention for a group of long-term health-care workers at the center of the study.

"We discovered that people who are able to find meaning and purpose in their work, and can see how they make a difference through that work, are healthier, happier and more productive employees," said Val Kinjerski, a University of Alberta PhD graduate who co-authored the study and now works with organizations to cultivate productive workplaces.

The study focused on two groups of long-term health-care workers from two different care facilities in Canada. One group of 24 employees attended a Spirit at Work one-day workshop, followed by eight weekly booster sessions offered at shift changes. The workers were led through a variety of exercises designed to help staff create personal action plans to enhance spirit at work. They were asked to consider concepts like the deeper purpose of their work, being of service, appreciation of themselves and others, sense of community and self-care.

The second group of 34 workers was offered no support program.

The result for the intervention group was a 23 per cent increase in teamwork, a 10 per cent hike in job satisfaction and a 17 per cent jump in workplace morale. In addition, employer costs related to absenteeism were almost $12,000 less for the five months following the workshop than for the same period in the previous year. The employees also showed an increased interest in and focus on their patients, Kinjerski said.

"They really had a sense of what they were there to do, to be of service to their clients. This notion of being of service is important in all work, but in the field of long-term health care, it is of utmost importance."

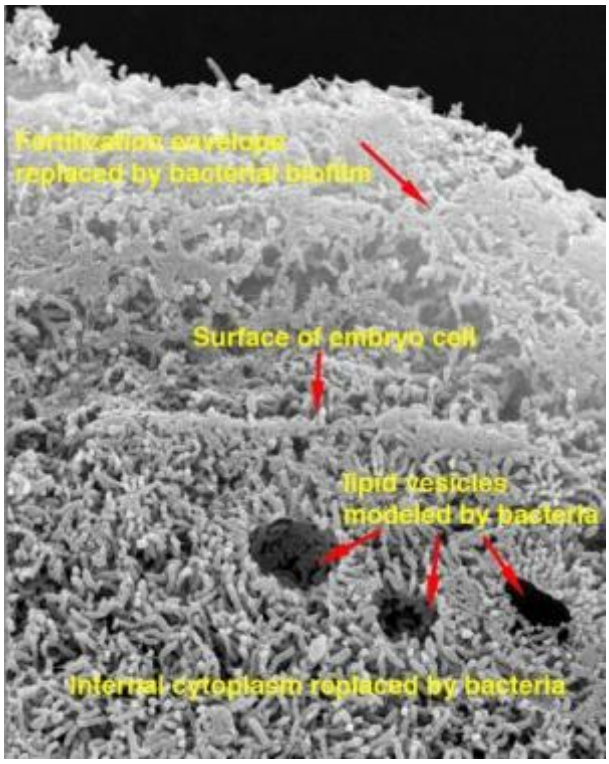
Ultimately, the findings will aid employers in retaining and fostering a happier, more motivated workforce, said Berna Skrypnek, a human ecology professor at the U of A and co-author of the study. "This has become a leading concern in the long-term health-care field and for that matter, in any field, as labour markets become tighter and employees are demanding meaning and fulfillment from their work."

The results were published recently in the Journal of Gerontological Nursing. This study was supported by a grant from the Capital Care Foundation in Edmonton, Canada.

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

http://www.sciencedaily.com/releases/2008/11/081126122317.htm

Bacterial Biofilms As Fossil Makers



*The invasion of dying Heliocidaris erythrogramma cells by bacteria can create a faithful replica. Scientists believe embryo fossils are actually a bacterial "sculpture" -- a vestige of the embryos' destruction (Credit: F.R. Turner, E.C. Raff, and R.A. Raff)*ScienceDaily (Nov. 28, 2008) — Bacterial decay was once viewed as fossilization's mortal enemy, but new research suggests bacterial biofilms may have actually helped preserve the fossil record's most vulnerable stuff -- animal embryos and soft tissues.

A team of 13 scientists led by Indiana University Bloomington biologists Rudolf and Elizabeth Raff found that the invasion of dying embryo cells by bacteria -- and the subsequent formation of densely packed bacterial biofilms inside the embryo cells -- can completely replace embryo cell structure, generating a faithful replica of the embryo. The scientists call this formation a "pseudomorph," a model of the embryo made of bacteria. Their report will appear online via the Proceedings of the National Academy of Sciences "Early Edition" as early as Nov. 24."The bacteria consume and replace all the cytoplasm in the cells, generating a little sculpture of the embryo," said Elizabeth Raff, the report's lead author. "We did find, however, that certain conditions must be met if the bacteria are going to aid the preservation process."

Among those conditions, Raff said that at the time of its death, the embryo must exist in a low-oxygen or reducing environment, such as the bottom of a deep ocean or buried in anoxic lakeside mud. If significant oxygen is available, the embryo will undergo "autolysis," or self-destruction, as digestive enzymes get free and wreak havoc. Without oxygen, autolytic enzymes remain stuck inside their organelle prisons.

"The next step, we believe, is that bacteria able to survive in low-oxygen conditions must then infest the cells of the dying embryo," Raff said.

The bacteria form biofilms, crowded assemblies of bacterial cells held together by sticky fibers made of proteins and sugars. As the biofilms fill the embryo cells, the tiny bacteria insinuate themselves between and among the organelles, forming a faithful representation of the cell's innards.

Lastly, the bacteria must leave a permanent record. In the case of finely preserved fossil embryos, the bacteria likely excrete tiny crystals of calcium phosphate (CaPO4), which eventually replace the bacterial sculptures. It is these crystals, Raff says, that provide the support for embryo and soft tissue fossilization."That's a crucial step," said Rudolf Raff. "Calcium deposits can show us even minute details of structure and shape, not only of the bacteria laying down the minerals, but also of the embryo cell structures all around them. In our experiments, we observed bacteria depositing calcium carbonate (CaCO3), but not calcium phosphate. We'll need to simulate different conditions to fully replicate this step."

High resolution imaging of a trove of half-a-billion-year-old animal embryo fossils from Doushantuo, China, provided scientists with tantalizing evidence that bacteria may have been involved in the preservation of the delicate cells. Scanning electron microscopy shows oblong concavities on the surface of the embryo fossils, suggesting the cells had been infested with bacteria or bacterial biofilms.

The research presented in the PNAS paper reveals how bacteria-aided fossilization could happen.The Raffs studied early-stage embryos of two Australian sea urchin species, Heliocidaris erythrogramma and Heliocidaris tuberculata. The experimental results with modern embryos were compared to the high resolution images of fossil embryos prepared by colleagues from China, England, Sweden, and Switzerland.

The scientists examined embryos in the presence of high and low oxygen, with or without inoculums of oxygen-poor marine mud, and in the presence or absence of bacteria-killing antibiotics. In the experiments that produced embryo-infesting biofilms, the scientists used DNA sequence comparisons to identify the bacterial species present.The researchers learned low-oxygen conditions block autolysis, and that embryos prevented from autolyzing are quickly colonized by marine bacteria. Once inside, the bacteria form biofilms that fill the embryo cells. Sturdy cell membranes and the embryo's fertilization envelope provide the exterior cast. These biofilms formed detailed replicas of the embryos they had replaced.

Species of the common marine bacterium Pseudoalteromonas provided the majority of the bacterial flora present inside the embryo cells under aerobic conditions. Under oxygen-poor conditions, a much greater diversity of bacterial species was present, not detectable under aerobic conditions.

The scientists also examined oxygen-starved embryos exposed to inoculums of oxygen-poor marine mud, and again found a high diversity of bacterial flora present in embryo replica biofilms, with species of the Bacteroidetes phylum being most common.Although it is impossible to know whether bacteria aided the preservation of 550-million-year-old embryo fossils from Doushantuo and elsewhere, the Raffs argue the evidence they gathered strongly favors the view that bacteria are a fundamental force in fossil formation, as rapid biological processes must be available to convert highly delicate cells into a stable form and catalyse mineralization."This work is important because it helps us understand fossilization as a biological as well as geological process," Elizabeth Raff said. "It gives us a window onto the evolution of the embryos of the earth's first animals."

Kaila Schollaert, David Nelson, F. Rudolf Turner, Barry Stein (Indiana University Bloomington), Philip Donoghue, Ceri-Wyn Thomas (University of Bristol), Xiping Dong (Peking University), Stefan Bengtson (Swedish Museum of Natural History), Therese Huldtgren (Swedish Museum of Natural History and Stockholm University), Marco Stampanoni (Paul Scherrer Institute and Institute for Biomedical Engineering), and Yin Chongyu (Chinese Academy of Geological Scientists) also contributed to this report. The Raffs' research was supported largely by Indiana University.

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

http://www.sciencedaily.com/releases/2008/11/081124174859.htm

Urban Trees Enhance Water Infiltration

Urban tree roots have the potential to penetrate compacted subsoils and increase infiltration rates in reservoirs being used to store stormwater. (Credit: iStockphoto/Dan Moore)

ScienceDaily (Nov. 28, 2008) — Global land use patterns and increasing pressures on water resources demand creative urban stormwater management. Traditional stormwater management focuses on regulating the flow of runoff to waterways, but generally does little to restore the hydrologic cycle disrupted by extensive pavement and compacted urban soils with low permeability. The lack of infiltration opportunities affects groundwater recharge and has negative repercussions on water quality downstream.

Researchers know that urban forests, like rural forest land, can play a pivotal role in stormwater mitigation, but developing approaches that exploit the ability of trees to handle stormwater is difficult in highly built city cores or in urban sprawl where asphalt can be the dominant cover feature.

A group of researchers from Virginia Tech, Cornell, and University of California at Davis have been investigating innovative ways to maximize the potential of trees to address stormwater in a series of studies supported by the U.S. Forest Service's Urban and Community Forestry Grants Program.

Virginia Tech scientists used two container experiments to establish that urban tree roots have the potential to penetrate compacted subsoils and increase infiltration rates in reservoirs being used to store stormwater. In one study, roots of both black oak and red maple trees penetrated clay loam soil compacted to 1.6 g cm-3, increasing infiltration rates by an average of 153%.

In another experiment, researchers created a small-scale version of the stormwater best management practice (BMP) under study by the three universities. This BMP includes a below-pavement stormwater detention reservoir constructed of structural soil. Structural soils are engineered mixes designed to both support pavement loads and simultaneously provide rooting space for trees. In this study, green ash trees increased the average infiltration rate by 27 fold compared with unplanted controls. In the experiment, a structural soil reservoir (CUSoil, Amereq Corp., New York) was separated from compacted clay loam subsoil (1.6 g cm-3) by a woven geotextile in 102-liter containers. The roots of ash trees planted in the structural soil penetrated both the geotextile and the subsoil within two years.

"Although we observed many roots penetrating the geotextile, roots really proliferated where there was a slight tear in the fabric," said Susan Day, the project's lead investigator. "Manipulating root penetration through these separation geotextiles could potentially play a large role in bioretention system function and design, especially since the potentially saturated soils beneath detention reservoirs may have reduced soil strength, increasing opportunities for root growth by some species."

Structural soil reservoirs may thus provide new opportunities for meeting engineering, environmental, and greenspace management needs in urban areas. Further research is needed on the effects of tree roots and detention time on water quality in structural soils. Monitoring continues at four demonstration sites around the country and updated information is posted as it becomes available at http://www.cnr.vt.edu/urbanforestry/stormwater.

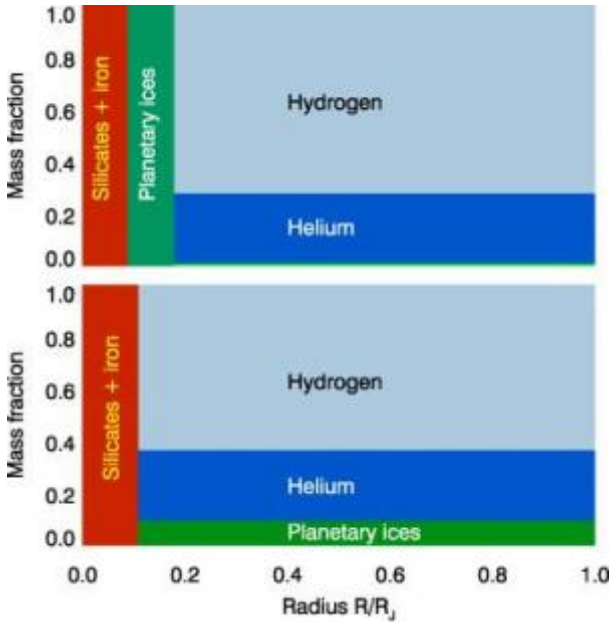
Journal reference:

1. Bartens et al. **Can Urban Tree Roots Improve Infiltration through Compacted Subsoils for Stormwater Management?** *Journal of Environmental Quality*, 2008; 37 (6): 2048 DOI: 10.2134/jeq2008.0117

Adapted from materials provided by American Society of Agronomy.

http://www.sciencedaily.com/releases/2008/11/081119120153.htm

Jupiter's Rocky Core Bigger And Icier, According To New Simulation



A new simulation of Jupiter's interior (top) predicts a large rocky core surrounded by methane, water and ammonia ices, with hardly any ice in the hydrogen and helium atmosphere that makes up 95 percent of the planet's mass. Previous models (bottom) predicted a core half the size and ices throughout the atmosphere. (Credit: Burkhard Militzer/UC Berkeley)

ScienceDaily (Nov. 27, 2008) — Jupiter has a rocky core that is more than twice as large as previously thought, according to computer calculations by a University of California, Berkeley, geophysicist who simulated conditions inside the planet on the scale of individual hydrogen and helium atoms.

The simulation predict the properties of hydrogen-helium mixtures at the extreme pressures and temperatures that occur in Jupiter's interior, which cannot yet be studied with laboratory experiments. Applying techniques originally developed to study semiconductors, UC Berkeley's Burkhard Militzer, an assistant professor of earth and planetary science and astronomy, calculated the properties of hydrogen and helium for temperature, density and pressure at the surface all the way to the planet's center.

Coauthor William B. Hubbard, professor of planetary sciences at the University of Arizona's Lunar and Planetary Laboratory in Tucson, used the theoretical data to build a new model for Jupiter's interior. The results were published Nov. 20 in Astrophysical Journal Letters.

A comparison of this model with the planet's known mass, radius, surface temperature, gravity and equatorial bulge implies that Jupiter's core is an Earth-like rock 14 to 18 times the mass of Earth, or about one-twentieth of Jupiter's total mass, Militzer said. Previous models predicted a much smaller core of only 7 Earth masses, or no core at all.

The simulation suggests that the core is made of layers of metals, rocks and ices of methane, ammonia and water, while above it is an atmosphere of mostly hydrogen and helium. At the center of the rocky core is probably a metallic ball of iron and nickel, just like Earth's core.

"Our simulations show there is a big rocky object in the center surrounded by an ice layer and hardly any ice elsewhere in the planet," Militzer said. "This is a very different result for the interior structure of Jupiter than other recent models, which predict a relatively small or hardly any core and a mixture of ices throughout the atmosphere."

"Basically, Jupiter's interior resembles that of Saturn, with a Neptune or Uranus at the center," he said. Neptune and Uranus have been called "ice giants" because they also appear to have a rocky core surrounded by icy hydrogen and helium, but without the gas envelope of Jupiter and Saturn.

"This new calculation by Burkhard removes a lot of the old uncertainties of the 19-year-old model we have had until now," Hubbard said. "The new thermodynamic model is a more precise physical description of what's going on inside Jupiter."

The large, rocky core implies that as Jupiter and other giant gas planets formed 4.5 billion years ago, they grew through the collision of small rocks that formed cores that captured a huge atmosphere of hydrogen and helium.

"According to the core accretion model, as the original planetary nebula cooled, planetesimals collided and stuck together in a runaway effect that formed planet cores," Militzer said. "If true, this implies that the planets have large cores, which is what the simulation predicts. It is more difficult to make a planet with a small core."

In order to match the observed gravity of Jupiter, Militzer's simulation also predicts that different parts of Jupiter's interior rotate at different rates. Jupiter can be thought of as a series of concentric cylinders rotating around the planet's spin axis, with the outer cylinders - the equatorial regions - rotating faster than the inner cylinders. This is identical to the sun's rotation, Militzer said.Militzer modeled Jupiter's interior as a collection of 110 hydrogen and nine helium atoms in a tiny cube that is replicated throughout the planet, a common approximation in "density functional theory." The ratio of hydrogen to helium atoms approximates the ratio measured on the surface of Jupiter. Each simulation took from one to seven days on parallel computing clusters.

Based on this simulation, under the high pressure and temperature deep within the planet, hydrogen changes from a molecular to a metallic state, which provides good electrical conductivity and gives rise to Jupiter's magnetic field. This transition happens gradually, contrary to earlier models that predict a sharp transition.The new model of Jupiter predicts that most of the ices are concentrated in the outer layer of the core, while only a small amount is mixed in the hydrogen-helium gas envelope that contains 95 percent of the planet's mass. The "planetary ices" in the envelope amount to about four Earth masses, or 1 percent of Jupiter's mass, Militzer said.

"Jupiter formed beyond the ice line and so accreted ice along with the rocky material," he said. "As a result, the ice is part of the core and is not in the envelope.""The simulation was in pretty good agreement with what the Galileo probe measured" when the NASA spacecraft descended through Jupiter's atmosphere in 1995, Hubbard said.

Militzer plans to use the new model to simulate other planets' interiors, and to investigate the implications for the formation of planets outside our solar system. Future data from NASA's Juno mission, to be launched in 2011 and orbit Jupiter by 2016 to measure the planet's magnetic field and gravity, will provide a check on Militzer's predictions. Hubbard is one of the mission's co-investigators.Coauthors with Militzer and Hubbard are post-doctoral researcher Jan Vorberger of the University of Warwick in the United Kingdom, and graduate student Isaac Tamblyn and Professor of Physics Stanimir A. Bonev of Dalhousie University in Halifax, Nova Scotia, Canada.The research was supported by the National Aeronautics and Space Administration and the National Science Foundation.

Adapted from materials provided by University of California - Berkeley.

http://www.sciencedaily.com/releases/2008/11/081125132520.htm

A Surgeon You Can Swallow

A model of a self-assembling stomach robot: a magnetic mechanism connects three modules together via intermediate linkages. (Credit: Image courtesy of ETH Zurich)

ScienceDaily (Dec. 1, 2008) — In the future, tablet-shaped robots could perform some surgical operations without injuring the body. A new publication by the Institute of Robotics and Intelligent Systems of ETH Zurich shows how such surgical bio-microrobots might function.

Paolo Dario, Professor of Biomedical Robotics at the Scuola Superiore Sant'Anna in Pisa, Italy, explained the dawn of a new medical era in the September edition of the American financial magazine "The Economist". Surgical operations with open wounds are increasingly being replaced by non-invasive techniques extending even to systems that enable operations without a single scar.

Bio-microrobotics has a decisive role in this development. Like the Scuola Superiore Sant'Anna, ETH Zurich is also a part of the EU's ARES research project (Assembling Reconfigurable Endoluminal Surgical System), a consortium of robotics experts from four European higher education institutions. Together, the researchers want to make micro-robots usable for medical applications. The plan is that, in the future, robots no bigger than a conventional capsule will perform a series of tasks in the gastro-intestinal tract, e.g. a gastroscopy or a tissue biopsy.

Although pill-shaped micro-cameras have existed for seven years now and are currently being used successfully in surgery to study the gastro-intestinal tract, these systems are passive. The camera takes thousands of pictures as it passes through the gastro-intestinal tract, but its position during this time cannot be controlled. This should soon change, because the ARES scientists are currently developing micro-robots with controllable insect-like legs with which the "robot pills" would be able to move around in the stomach. Other groups are working on special devices for tissue biopsy. In the future, such instruments could be used to make a precise examination of damaged regions in the gastro-intestinal tract while at the same time taking tissue samples for subsequent investigation.

Multi-segment, self-assembling stomach robots

One of the biggest challenges facing the robotics scientists relates to the enormous miniaturisation of the electronic systems. Room for the system's entire technology, including the power supply, must be found

within a few cubic millimetres. In the micro-cameras that are already established, the battery alone takes up 60 percent of the capsule's volume. Hence one key question: how can a series of surgical robot functions be brought into a form that the patient can swallow and which is at the same time compatible with the body?

In a recent publication, Zoltan Nagy, a doctoral student at the Institute of Robotics and Intelligent Systems of ETH Zurich (IRIS) since 2006, presents the following approach to a solution: the patient swallows not one but several "robot pills" fitted with individual functions, such as the controller or forceps for tissue sampling. The pills can be swallowed one after another and assemble themselves automatically to form a larger, more powerful system only when they reach the stomach. For this purpose, Nagy developed a magnetic mechanism that enables the parts of the robot to join together automatically in the stomach to form an entire system. The individual components are polarized at right angles to the surface, so they arrange themselves in a predictable sequence when they come together.

The system was tested in an artificial stomach with a 75 percent success rate. Because a rigid chain of several robot components moves only with difficulty through the stomach and intestine, Nagy has also developed intermediate links that make the system more mobile. This would enable the surgical system to move as a whole through the stomach and intestine, like a multi-link chain. A magnetic system has the added advantage that the magnetic field changes in a characteristic way when the individual members of the chain come together. This change is measurable and can be communicated to a computer and used as an indicator of the exact position and arrangement of the robot snake.

Probing the limits of feasibility

The use of such a system in the human body is still a long way off. Firstly, the energy supply within the precarious space conditions is still largely unsolved. However, according to Nagy, this problem could soon be eliminated by using a combination of a battery and induction. Secondly, biocompatibility presents the scientists with major challenges. If trials on humans take place one day, the scientists must be able to guarantee that the magnetic mechanism and the functions of the robots cannot cause any tissue injury. The entire system must also be capable of being dismantled into its individual parts at any time if complications occur.

This is why Nagy does not expect any in-vivo tests of his self-assembling system in the near future. In any case that is not his top priority aim. "ARES is concerned primarily with expanding the limits of feasibility in bio-microrobotics. I have presented one possible mechanism for the self-assembly of a robot that has potential for surgical application. At present, it is impossible to predict which system will gain acceptance in practice in the future."

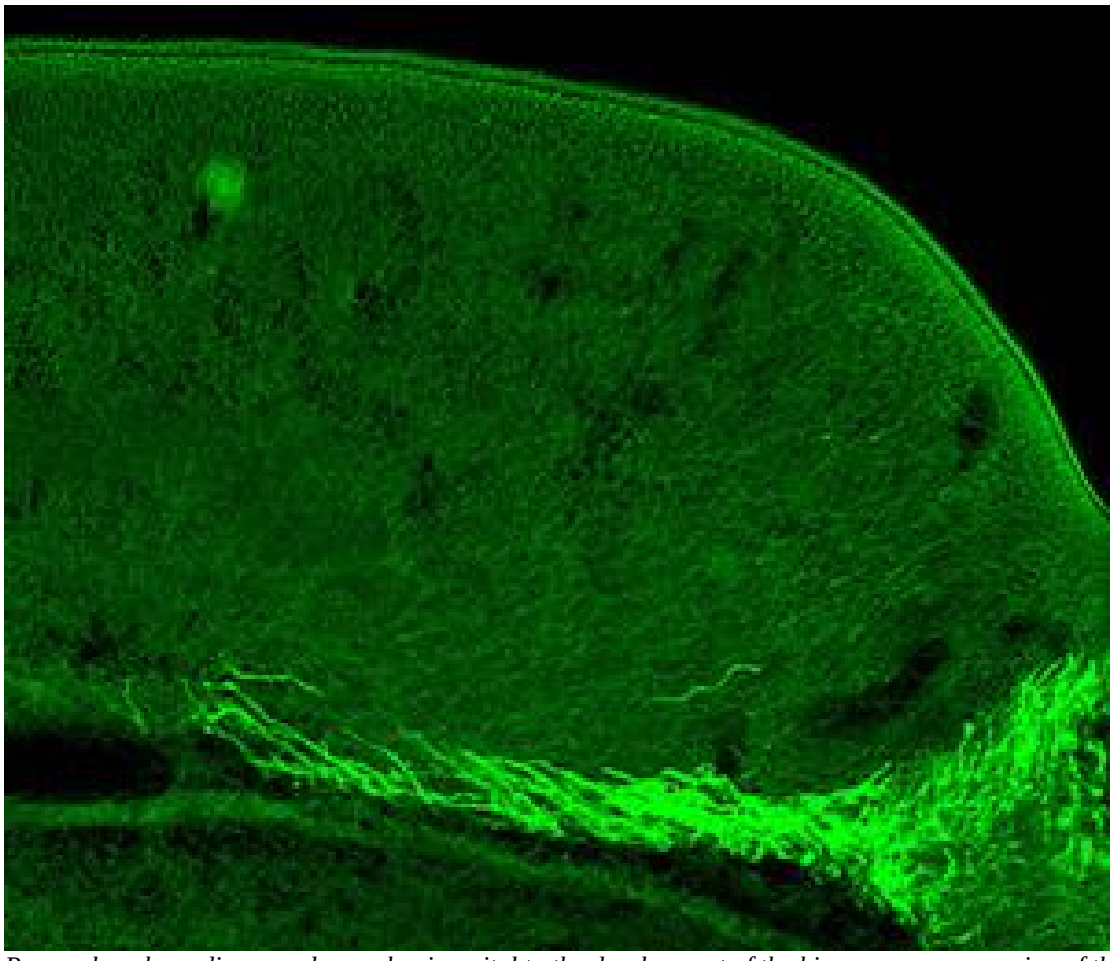
Journal reference:

1. Nagy Z, Oung R, Abbott JJ, Nelson BJ. **Experimental investigation of magnetic self-assembly for swallowable modular robots**. *Proc. IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)*, 2008; 1915-1920 DOI: 10.1109/IROS.2008.4650662

Adapted from materials provided by ETH Zurich. Original article written by Samuel Schlaefli.

http://www.sciencedaily.com/releases/2008/11/081129173859.htm

Memory Mission Explores New Territory In Neuroscience



Researchers have discovered a mechanism vital to the development of the hippocampus – a region of the brain crucial to the formation of memories, and the lifelong production and integration of new nerve cells. (Credit: Image courtesy of Queensland Brain Institute)

ScienceDaily (Dec. 1, 2008) — Astrophysicists peer into the far corners of deep space for dark matter, but for neuroscientists at the Queensland Brain Institute (QBI) exploring the unknown is much closer to home.

They have discovered a mechanism vital to the development of the hippocampus * – a region of the brain crucial to the formation of memories, and the lifelong production and integration of new nerve cells.

To say the hippocampus is important is a bit like saying breathing is optimal.

According to QBI's Associate Professor Linda Richards, despite the crucial role performed by the hippocampus throughout life, knowledge of this region's early development remains surprisingly scant. Her research team is looking at how the brain forms during embryonic and foetal development.

Dr Richards and her colleagues have identified a gene that regulates the development of glial cells in the hippocampus. Their research shows that the hippocampus contains different populations of glial cells that are essential for the structural integrity of the hippocampus.

"Glial cells are an important part of the building blocks of the brain," Dr Richards said.

"They provide an essential scaffold for the migration of neurons in the developing brain. It is vital we understand how glial cells provide this structural scaffold because if the hippocampus is not formed correctly it cannot perform all the functions required of it in the developing and adult brain," she said.

"The hippocampus plays an integral role in spatial navigation, learning and memory, and is a major site for adult neurogenesis."

Mice lacking the gene that regulates glial cell differentiation exhibit major developmental irregularities, including catastrophic structural deformities of the hippocampus.

Equipped with this knowledge, researchers studying the hippocampus now have a better understanding of the genes that help control the development of this vital brain region. Fundamental scientific knowledge of this kind is an essential step in understanding brain function and repair.

* The term hippocampus is derived from the Greek words "hippos" (horse) and "campus" (sea monster). The brain region known as the hippocampus has the characteristic shape of a sea-horse's tail.

Journal reference:

1. Barry et al. **Specific Glial Populations Regulate Hippocampal Morphogenesis**. *Journal of Neuroscience*, 2008; 28 (47): 12328 DOI: 10.1523/JNEUROSCI.4000-08.2008

Adapted from materials provided by Queensland Brain Institute.

http://www.sciencedaily.com/releases/2008/11/081121092456.htm

Potassium Loss From Blood Pressure Drugs May Explain Higher Risk Of Adult Diabetes

ScienceDaily (Dec. 1, 2008) — Johns Hopkins researchers have discovered that a drop in blood potassium levels caused by diuretics commonly prescribed for high blood pressure could be the reason why people on those drugs are at risk for developing type 2 diabetes. The drugs helpfully accelerate loss of fluids, but also deplete important chemicals, including potassium, so that those who take them are generally advised to eat bananas and other potassium-rich foods to counteract the effect.

"Previous studies have told us that when patients take diuretic thiazides, potassium levels drop and the risk of diabetes climbs to 50 percent," says lead researcher Tariq Shafi, M.D., M.H.S., of the Department of Nephrology at Johns Hopkins University School of Medicine. "Now, for the first time, we think we have concrete information connecting the dots."

Thiazides, such as chlorthalidone, are an inexpensive and highly effective way to treat high blood pressure and have been used widely for decades. However, their association with diabetes has forced many hypertension suffers to use other medications that can be several times as expensive, says Shafi.

"This study shows us that as long as physicians monitor and regulate potassium levels, thiazides could be used safely, saving patients thousands of dollars a year," says Shafi. "It could be as simple as increasing the consumption of potassium-rich foods like bananas and oranges and/or reducing salt intake, both of which will keep potassium from dropping."

Researchers examined data from 3,790 nondiabetic participants in the Systolic Hypertension in Elderly Program (SHEP). SHEP is a randomized clinical trial conducted between 1985 and 1991 designed to determine the risk versus benefit of giving a certain high blood pressure medication to people age 60 years or older.

Half of the subjects were treated with chlorthalidone and half with a fake drug. Of the 3,790 subjects, 1,603 were men and 724 were nonwhite. None had a history of diabetes. In the original study, potassium levels were monitored as a safety precaution to guard against irregular heartbeat, a condition that can result from low potassium.

The results, published online this month in the journal Hypertension, showed that for each 0.5 milliequivalent-per-liter (MEq/L) decrease in serum potassium, there was a 45 percent increased risk of diabetes. None of the people in the group receiving the fake drug developed low potassium levels. Shafi says these findings should encourage physicians to establish a potassium baseline by checking hypertensive patients' medical records to determine their potassium levels before prescribing thiazides.

"We would normally look at the number only after six weeks of treatment to make sure it was not low enough to cause heart problems. As a result, we might not be aware that it dropped significantly from where it was before treatment — putting the patient at risk for developing diabetes," says Shafi.

Additional Johns Hopkins researchers who contributed to this study are Lawrence J. Appel, M.D., M.P.H.; Edgar R. Miller III, M.D, Ph.D.; Michael J. Klag, M.D., M.P.H., and Rulan S. Parekh, M.D., M.S.

Adapted from materials provided by Johns Hopkins Medical Institutions, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081124165257.htm

Mercury Tarnishes Louisiana Fish

ScienceDaily (Dec. 1, 2008) — By day a mild-mannered micropaleontologist with an interest in sea levels and ancient sediment, in his free time Barry Kohl acts as a "catalyst" to bring nongovernmental organizations, industry and state agencies together in the fight to remove mercury from the environment.

Mercury-containing pressure gauges in the natural gas fields, coal-fired power plants and chlorine plants are among the sources of mercury that concern Kohl, an adjunct professor in the Department of Earth and Environmental Sciences in the Tulane School of Science and Engineering.

In 1994, Kohl became concerned about high levels of mercury in the sediment and fish of the Pearl River, a popular fishing spot in Louisiana where people had little knowledge of mercury contamination. He took his concerns to the legislature.

"We are supposed to be the 'Sportsman's Paradise.' With 43 fish advisories and with signs posted all over the state warning about the fish, it's not something that we can boast about," says Kohl, acknowledging the bittersweet success of his advocacy.

"Mercury is a significant health issue. The only way to control it is to stop it being discharged into the soil and the air and to clean up existing sources," he says.

Methyl mercury affects brain and nervous system development in unborn babies and young children, which is why advisories warn that pregnant women, breastfeeding women and young children should not eat locally caught fish.

Kohl played a role in securing ongoing funding of $200,000 a year for the Louisiana Mercury in Fish Project, the passage of the 2006 Mercury Reduction Act and the publication of the "Mercury Risk Reduction Plan," parts of which Kohl edited.

"It's the outside participation through professors and nongovernmental organizations that is getting the state agencies to address the issues," explains Kohl, who defines his role as a catalyst. "With any good government you have to have the public involved. I have the science background, and I can offer ideas about procedures to clean up contaminated sites in the state."

One of Kohl's priorities is developing a timely procedure for industry to use in cleaning up the estimated 20,000 mercury-containing pressure gauges throughout the state's natural gas fields. Kohl calculates that there are nearly 200,000 pounds of mercury in those gauges, many of which are abandoned and leak mercury into the state's wetlands.

People who are interested in helping to reduce mercury and mercury exposure can get involved by joining advocacy groups, says Kohl, who points out that mercury is not only a Louisiana issue but a national and global concern.

Adapted from materials provided by Tulane University, via Newswise.

http://www.sciencedaily.com/releases/2008/11/081122090900.htm

Life Is A Highway: Study Confirms Cars Have Personality

Many people see human facial features in the front end of automobiles and ascribe various personality traits to cars -- a modern experience driven by our prehistoric psyches. (Credit: iStockphoto/Brian Sullivan)

ScienceDaily (Dec. 1, 2008) — No one needs to tell Disney, which brought the likes of Herbie the Love Bug and Lightning McQueen to the big screen, that cars have personality.

Now a study co-authored by a Florida State University researcher has confirmed through a complex statistical analysis that many people see human facial features in the front end of automobiles and ascribe various personality traits to cars -- a modern experience driven by our prehistoric psyches. Researchers, product designers and, of course, filmmakers have long toyed with the idea that cars have faces, but this study is the first to investigate the phenomenon systematically.

"The study confirmed with some rigor what many people have already felt -- that cars seem to have consistent personality traits associated with them, and that this is similar to the way people perceive facial expressions," said Dennis Slice, an associate professor in Florida State's Department of Scientific Computing. "The most unique aspect of the study was that we were able to quantitatively link the perception of cars to aspects of their physical structure in a way that allows us to generate a car that would project, say, aggression, anger or masculinity or the opposite traits."

As a guest professor at the University of Vienna, Slice collaborated with doctoral student Sonja Windhager, the study's lead author, and several colleagues to explore the link between perception and the geometry of a car front and its parts. The researchers asked 40 people to view high-resolution, 3-D computer reconstructions and printed images of 38 actual 2004-06 car models, representing 26 manufacturers from Ford to Mercedes.

One-third (32.5 percent) of those participating in the experiment associated a human or an animal face with at least 90 percent of the cars. Generally, the headlights were marked as eyes; the nose tended to be the grill or emblem; the additional air intake slots, the mouth. Each participant in the experiment also was

asked to rate each model on 19 traits, including dominance, maturity, gender and friendliness, and if they liked the car.

"In our study, people generally agreed in their ratings," Slice said, noting that 96 percent agreed on whether a car was dominant or submissive. "Thus, there must be some kind of consistent message that is being perceived in car fronts."

For example, cars scoring high in the so-called power traits had horizontally elongated hoods, pronounced lower car bodies relative to the windshields and more angular headlights that seemed to suggest a frown. Conversely, cars on the other end of the power scale -- that is, those perceived as childlike, submissive, female and friendly -- had headlights with their upper edge relatively close to the midline and had an upward shift of the car's lateral-most points. ("In this way, the car gives us a big smile," Slice said.)

In a finding that suggests perhaps there is a hidden road warrior in all of us, study participants liked power vehicles best -- the most mature, masculine, arrogant and angry-looking ones. Although people do not necessarily buy the kind of car they say they like, Slice said the finding spurs some interesting questions for future studies about pedestrian and driver behavior. For example, do people extend the perception of the car to the person behind the wheel? And does that affect how drivers interact with other cars on the road?

In addition, the study provides a check into the rearview mirror of our prehistoric psyches, Slice said. The researchers theorized that, through biological evolution, our brains have been designed to infer a great deal of information about another person -- age, sex, attitudes, personality traits and emotions -- from just a glance at their face. The ability to "read" faces in order to identify people, detect possible kin relationships and assess potential danger has been so important to human development that people have adapted a hypersensitivity to detecting facial features even if they are presented in rather abstract ways. As a result, we are tempted to see faces everywhere, even in clouds, stones and, yes, cars.

"The fact that we can so easily see faces in inanimate objects may tell us something about the evolutionary environment in which this capacity arose," Slice said. "Seeing too many faces, even in mountains or toast, has little or no penalty, but missing or misinterpreting the face of a predator or attacker could be fatal."

Journal reference:

1. Windhager S, Slice DE, Schaefer K, Oberzaucher E, Thorstensen T, Grammer K. **Face to face: The Perception of Automotive Designs**. *Human Nature*, December 2008 DOI: 10.1007/s12110-008-9047-z

Adapted from materials provided by Florida State University.

http://www.sciencedaily.com/releases/2008/11/081125161542.htm

Want Sustainable Fishing? Keep Only Small Fish, And Let The Big Ones Go

Large mouth bass in a lake. A fish population will produce more young -- and therefore sustain more fishing -- if it is made up of big, old fish. (Credit: iStockphoto/Judy Ledbetter)

ScienceDaily (Dec. 1, 2008) — Scientists at the University of Toronto analysed Canadian fisheries data to determine the effect of the "keep the large ones" policy that is typical of fisheries. What they found is that the effect of this policy is an unsustainable fishery.

In fact, the opposite policy (keep the small young ones and throw back the large old ones) would result in a more sustainable fishery. In short -- a big fish in the water is worth two in the net.

Put simply, a fish population will produce more young -- and therefore sustain more fishing -- if it is made up of big, old fish.

The team of scientists, led by Paul Venturelli, a graduate student in the Department of Ecology and Evolutionary Biology, used a simple population model, as well as evaluating data from 25 marine fish species. They also tailored their methods to allow for other possible causes for the results, such as the effect of climate.

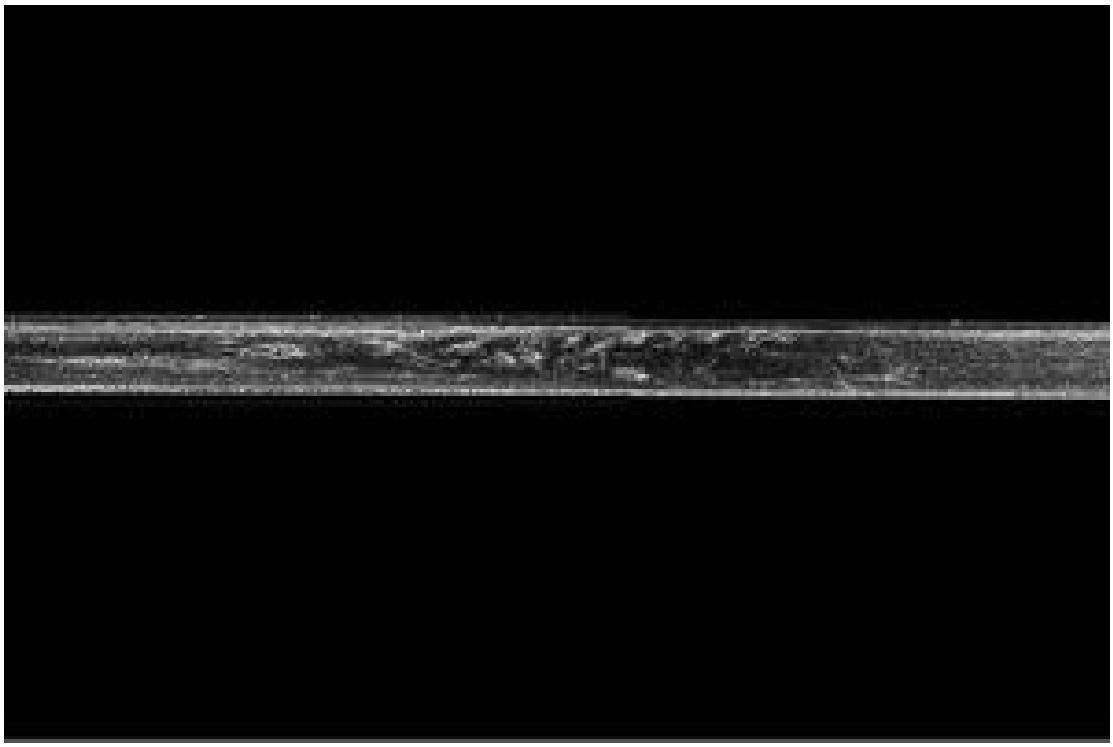
Finding ways to replenish fishery stocks and improve management provides both ecological and financial benefits.

The research is published in the Proceedings of the Royal Society B.

Adapted from materials provided by University of Toronto.

http://www.sciencedaily.com/releases/2008/11/081130210013.htm

Putting An End To Turbulence



A turbulent eddy flowing through a thin glass pipe. The flow is laminar in front of and behind the eddy. (Credit: MPIDS)

ScienceDaily (Dec. 1, 2008) — When a flow reaches a certain speed, things get turbulent: The fluid or the gas no longer flows in an orderly fashion but whirls around wildly. However, in contrast to what researchers assumed until now, this state is not permanent.

Scientists from the Max Planck Institute for Dynamics and Self-Organization in Göttingen, Germany, and the Technical University in Delft, Netherlands, have shown that in pipe flows, all turbulence will disappear with time. The new measurements are significantly more precise than all previous experiments and computer simulations concerned with this question.

Turbulent flows in pipes are of importance for many every-day applications. What they all have in common is their appearance: They travel down the pipe bubbling and gurgling like a mountain stream. The flow only calms down when its speed is reduced. Scientists call this calmer state laminar. Crucial for the difference between laminar and turbulent flow are the inner forces that link the water molecule to each other. Only if the influence of these inner forces is smaller than the influence of the forces that accelerate the flow can turbulence appear.

Until now, scientists assumed that a turbulent flow travelling with a constant speed will always remain turbulent. However, scientists from Göttingen and Delft have now found evidence that points to the contrary. "Our measurements show that every turbulent flow in a pipe will inevitably become laminar", says Dr. Björn Hof from the Max Planck Institute for Dynamics and Self-Organization. Depending on the exact geometry of the pipe this transition may take many years. But just like a ball inside a hollow, that always rolls back into the equilibrium position, only the laminar flow is stable.

For their measurements the scientists let water flow through glass pipes of up to 14 meters length and only a few millimetres in diameter. With the help of a short water pulse from the side they created a

turbulent eddy in the otherwise perfectly laminar flow. They then monitored closely, how this eddy changed as it travelled down the pipe. From the probability with which it reached the end of the pipe they could derive the basic principles that govern turbulence.

"In order to discern whether turbulence is stable or only has an extremely long lifetime, our measurements had to be very exact", says Hof. For example, it was crucial to keep the temperature of the water absolutely constant during the experiment. The measuring accuracy which the scientists achieved in this way exceeded all previous experiments. Even computer simulations cannot provide such precise data.

It is still unclear whether the new results also hold true for flows outside of pipes. But even now the results could help in ending turbulence in pipes in a controlled way. "Turbulent flow consumes more energy than do laminar ones. In many applications such as oil pipelines they are therefore bothersome", explains Hof. Since the flows aspire to turn laminar on their own, it could be possible to shorten the long lifetime of the turbulence with the help of a small perturbation. This could help save energy.

Journal reference:

1. Hof et al. **Repeller or Attractor? Selecting the Dynamical Model for the Onset of Turbulence in Pipe Flow**. *Physical Review Letters*, Nov 21, 2008; 101 (21): 214501 DOI: 10.1103/PhysRevLett.101.214501

Adapted from materials provided by Max-Planck-Gesellschaft.

http://www.sciencedaily.com/releases/2008/11/081121101003.htm

Diabetes Medications In Same Class Carry Different Risks Of Heart Failure, Death

ScienceDaily (Dec. 1, 2008) — Older adults who take the diabetes medication rosiglitazone appear to have a higher risk of death and heart failure than those taking the related medication pioglitazone, according to a report in the November 24 issue of Archives of Internal Medicine, one of the JAMA/Archives journals.

In 1997, a new class of oral medications known as thiazolidinediones expanded the available options for diabetes treatment, according to background information in the article. These drugs offered several clinical benefits, including decreased insulin resistance, better control of blood sugar and, for some patients, a delay in beginning insulin therapy. Two agents in this class, rosiglitazone maleate and pioglitazone hydrochloride, were approved and marketed beginning in 1999. Not long after, it became apparent that these drugs had important adverse effects, including heart failure and heart attack. A black box warning was recently added to both drugs cautioning against their use in patients with existing heart failure.

Recent meta-analyses have suggested that the risks associated with rosiglitazone may be higher than those associated with pioglitazone. To compare cardiovascular outcomes and death rates between the two therapies, Wolfgang C. Winkelmayer, M.D., Sc.D., and colleagues at Brigham and Women's Hospital and Harvard Medical School, Boston, used medical claims data to study 28,361 patients older than 65 years who began taking either rosiglitazone or pioglitazone between 2000 and 2005. Of these, 14,260 (50.3 percent) began treatment with pioglitazone and 14,101 (49.7 percent) with rosiglitazone.

After an average of 380 days taking pioglitazone or 369 taking rosiglitazone, 1,869 patients died. After adjusting for other factors, individuals taking rosiglitazone had a 15 percent higher rate of death and a 13 percent greater risk of heart failure compared with those taking pioglitazone. However, there were no differences in heart attack or stroke risk between the two groups.

"This study confirms the safety concerns that have been raised for rosiglitazone compared with pioglitazone, which, in turn, also cannot be considered a very safe drug given its well-documented effect on the risk of congestive heart failure," the authors write. "Although previous studies have indicated that the increased risk with rosiglitazone use resides predominantly in cardiovascular outcomes, the present study suggests that differences in all-cause mortality [death] risk may be even more important to consider in elderly patients."

This study was supported by a Scientist Development Grant from the American Heart Association; a Norman S. Coplon Extramural Research Program Award from Satellite Healthcare Inc.; and investigator-initiated grants from Amgen, Fresenius Medical Care and GlaxoSmithKline.

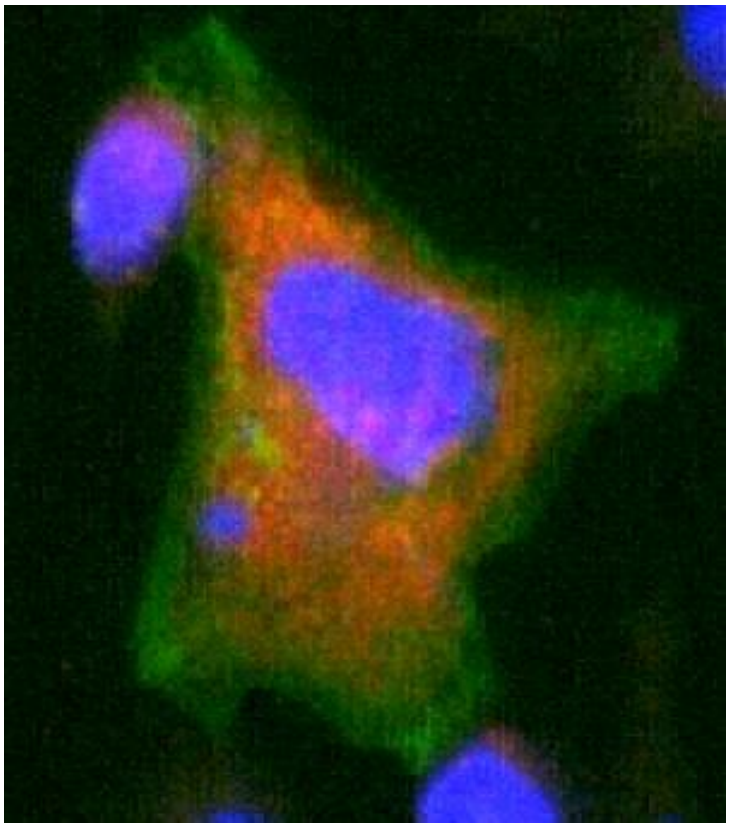
Journal reference:

1. Wolfgang C. Winkelmayer; Soko Setoguchi; Raisa Levin; Daniel H. Solomon. **Comparison of Cardiovascular Outcomes in Elderly Patients With Diabetes Who Initiated Rosiglitazone vs Pioglitazone Therapy**. *Archives of Internal Medicine*, 2008; 168 (21): 2368 DOI: 10.1001/archinte.168.21.2368

Adapted from materials provided by JAMA and Archives Journals, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081124165121.htm

Does Hormone Treatment Predispose Patients To Breast Cancer?



In the presence of AKT1 (green), BRCA1 (orange) is kept out of the nucleus (blue) (Credit: Copyright Laboratoire "Radiobiologie moléculaire et cellulaire")

ScienceDaily (Nov. 30, 2008) — Breast cancer, the leading cause of death among women in France, is the most commonly occurring cancer in women. Sporadic breast cancer, which is non-hereditary, turns out to be the most widespread, representing 85 to 90% of all cases, but remains the least well-known. Researchers at CNRS and CEA (1), working with a team from Hôpital Saint-Louis (2), have just discovered the cause of 50% of sporadic breast cancers.

The results should also explain epidemiological studies which suggest that hormone treatment predisposes patients to breast cancer. The work is published in 'Cancer Research'.

More than four out of five breast cancers are not related to hereditary factors. These cancers, which are called sporadic, are due to causes which were until recently considered complex and poorly understood. On the other hand, hereditary forms of cancer, which represent only 10 to 15% of breast cancers, have for years been the subjects of studies, work which has resulted in the identification of ten genes whose mutation increases the risk of cancer in an individual.

Among these genes, nine are involved in the DNA damage response system, which is the collection of cell mechanisms that optimize the repair of DNA. The tenth gene codes for a protein which inhibits the action of the AKT1 enzyme. And among these ten genes, two are responsible for 50% of hereditary breast cancers: BRCA1 and BRCA2. Researchers from the "Radiobiologie moléculaire et cellulaire" (CNRS / CEA) lab took these data on hereditary cancers as the starting point for their research into non-hereditary forms.

A link between hereditary and sporadic cancers It turns out that the AKT1 protein is over-expressed in 50% of sporadic breast cancers. Could this protein play a key role in predisposition to non hereditary breast cancer? The researchers, seeking an answer to this question, were able to show that activation of AKT1 leads to the sequestration of the BRCA1 protein in the cytoplasm. This makes it impossible for the protein to penetrate the nucleus, which prevents it from fulfilling its role in DNA repair. The cell then behaves as if it had no BRCA1 gene, without involving a mutation (unlike hereditary forms, where the BRCA1 gene undergoes an alteration). This phenomenon is observed in 50% of sporadic tumors. These results show a single, previously undetected, link between sporadic and hereditary cancers: the DNA damage response system.

The researchers have also suggested that hormone treatment may confer upon patients a predisposition to breast cancer. As AKT1 is activated by hormones, hormone treatment (3) could indeed, in some cases, result in the chronic activation of the molecule. If this is the case, it could lead to a deregulation of the BRCA1 gene, and, as a result, to breast cancer. These first results still need to be confirmed, something that the team led by Bernard Lopez (4) will do soon through further laboratory and clinical studies.

1. Institut de radiobiologie cellulaire et moléculaire, which is part of the Department of Life Sciences.
2. The team is led by Fabien Calvo, director of Inserm unit 716 "Cibles pharmacologiques dans les cancers"
3. Like for example estrogen treatment.
4. CNRS senior researcher and deputy director at the laboratory "Radiobiologie moléculaire et cellulaire"

Adapted from materials provided by CNRS (Délégation Paris Michel-Ange).

http://www.sciencedaily.com/releases/2008/11/081121081059.htm

Portuguese Scientists Discover New Mechanism That Regulates Formation Of Blood Vessels

ScienceDaily (Nov. 30, 2008) — Researchers in one of the external groups of the Instituto Gulbenkian de Ciência (IGC), in Portugal, have discovered a novel mechanism which regulates the process whereby new blood vessels are formed and wounds heal, including chronic wounds, such as those found in diabetic patients and those suffering from morbid obesity.

These findings, by Sérgio Dias and his team, are to appear in the new issue of the journal PLoSOne(*), and have implications for the development of new therapeutic approaches to healing damaged blood vessels and building new ones.

Working at the Centro de Investigação e Patobiologia Molecular of the Portuguese Institute of Oncology Francisco Gentil, in Lisbon, the team showed that the cells that make new blood vessels (called endothelial cells) are stimulated by an intracellular signalling pathway, mediated by the protein Notch.

The formation of new blood vessels is a crucial step in wound healing: the newly-formed vessels allow anti-inflammatory proteins to reach the wound site, improve oxygenation of the damaged tissue and carry essential nutrients for the re-structuring of the tissue, that is, the skin.

According to Francisco Caiado, a PhD student at the IGC, and first author of this study, “We knew that the endothelial cells are stimulated by cells originating in the bone-marrow, the so-called bone-marrow derived precursor cells. We have now shown that the actual stimulus happens through the Notch protein, found on the bone-marrow derived cells. Upon activation, Notch promotes the adhesion of the precursor cells to the site of the lesion, where they stimulate the endothelial cells to make new blood vessels”.

Chronic skin wounds are an increasing medical problem, since they are commonly found in diabetic patients and in those suffering from morbid obesity. Diabetic patients may develop “diabetic foot”, a condition whereby wounds do not heal leading, in the most severe cases, to amputation.

Journal reference:

1. Caiado et al. **Notch Pathway Modulation on Bone Marrow-Derived Vascular Precursor Cells Regulates Their Angiogenic and Wound Healing Potential**. *PLoS ONE*, 2008; 3 (11): e3752 DOI: 10.1371/journal.pone.0003752

Adapted from materials provided by Instituto Gulbenkian de Ciência (IGC), via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081117153305.htm

Pavement Sealcoat Linked To Urban Lake Contamination In The Central And Eastern United States

ScienceDaily (Nov. 30, 2008) — Dust collected from coal-tar sealcoated parking lots in Central and Eastern U.S. cities contains concentrations of polycyclic aromatic hydrocarbons (PAHs) that are about 1,000 times greater than levels found in Western cities where coal-tar sealcoat is less commonly used, according to a U.S. Geological Survey (USGS) study recently published in the journal Environmental Science and Technology.

The new study also shows that coal-tar sealcoat - the shiny black material applied to many parking lots and driveways - is contributing to PAH contamination in many of the nation's urban lakes. PAHs are an environmental concern because they are toxic to aquatic life and several are suspected carcinogens.

"In 2005, the USGS and the City of Austin, Texas, reported that particles in runoff from parking lots treated with coal-tar sealcoat in Austin contained extremely high concentrations of PAHs. This study extends those findings to the national scale," said Peter Van Metre, lead scientist on the study. "It's important because PAH levels are rising in urban watersheds in America, and understanding the sources of contamination is critical to reducing it."

Concentrations of PAHs in dust from coal-tar treated parking lots sampled in six Central and Eastern cities - Minneapolis, Chicago, Detroit, New Haven, Washington, D.C., and Austin - were about 1,000 times higher than levels from sealed and unsealed parking lots in three Western cities - Seattle, Portland, and Salt Lake City.

The regional differences can be explained by examining where coal-tar sealcoats are commonly used. Commercial availability suggests that coal-tar based sealcoat is commonly used in the Midwest, the South, and on the East Coast, while it is reported that asphalt-based sealcoat is commonly used in Western states. Coal-tar sealcoat products contain up to 30% coal tar. Coal tar has very high concentrations of PAHs. Asphalt-based sealcoat products have PAH levels that are about 1,000 times lower. Coal tar comes from the coking of coal and asphalt comes from oil.

USGS findings show that dust eroded from coal-tar treated parking lots in the six Central and Eastern cities had concentrations of PAHs that were about 80 times higher than concentrations in dust from unsealed asphalt and cement lots in the same cities. Minimal differences in PAH concentrations in dust were noted between sealcoated and unsealed lots sampled in the Western cities.

Two factors studied by USGS scientists - higher concentrations of PAHs in Central and Eastern lakes and chemical fingerprinting, which links the PAHs in pavement dust and lake sediment - indicate that use of coal-tar based sealcoat is an important contributor to PAH contamination of urban lakes. Three of the seven Central and Eastern lakes had PAH concentrations at levels expected to adversely affect aquatic life.

The USGS study did not evaluate human-health risk from exposure to sealcoat. PAHs in dust from two sealcoated residential driveways, however, provide a perspective on the possible relevance to human health. Concentrations of benzo[a]pyrene, one of the more toxic PAH compounds, were 5,300 times higher than the U.S. Environmental Protection Agency's "generic soil screening level" for evaluation and cleanup of contaminated soils for residential land use.

PAHs can be toxic to mammals, birds, fish, amphibians, invertebrates, and plants. Possible effects of PAHs on aquatic insects and other invertebrates include inhibited reproduction, delayed emergence, sediment avoidance, and mortality. Possible adverse effects on fish include fin erosion, liver abnormalities, cataracts, and immune system impairments. City of Austin scientists have reported toxicity and impaired aquatic communities related to sealcoat-contaminated sediment in local streams.

Sealcoat is used by homeowners and commercial applicators across the nation. It is applied to residential driveways and to parking lots of shopping centers, apartment and condominium complexes, churches, schools, and office parks. The sealcoat wears off of the pavement relatively rapidly, especially in areas of high traffic, and many surfaces are resealed every two to three years. Sealcoat typically is not applied to streets, roads or highways. The City of Austin and Dane County, Wis., where Madison is located, have banned use of coal-tar based sealcoat.

USGS findings will be published in the January 1, 2009, issue of Environmental Science & Technology (ES&T) and were posted on the ES&T website on Nov. 19, 2008.

Adapted from materials provided by US Geological Survey.

http://www.sciencedaily.com/releases/2008/11/081122075126.htm

Common Cold Virus Came From Birds About 200 Years Ago, Study Suggests

New research suggests that a virus that causes cold-like symptoms in humans originated in birds and may have crossed the species barrier around 200 years ago. (Credit: iStockphoto/Stephen Uber)

ScienceDaily (Nov. 30, 2008) — A virus that causes cold-like symptoms in humans originated in birds and may have crossed the species barrier around 200 years ago, according to a new article published in the Journal of General Virology. Scientists hope their findings will help us understand how potentially deadly viruses emerge in humans.

"Human metapneumovirus may be the second most common cause of lower respiratory infection in young children. Studies have shown that by the age of five, virtually all children have been exposed to the virus and re-infections appear to be common," said Professor Dr Fouchier. "We have identified sites on some virus proteins that we can monitor to help identify future dominant strains of the virus."

Human metapneumovirus is related to the respiratory syncytial virus, measles, mumps and parainfluenza viruses. It infects people of all ages but is most common in children under five. Symptoms include runny nose, cough, sore throat and fever. Infection can also lead to more severe illnesses such as bronchitis and pneumonia, which can result in hospitalisation, especially in infants and immunocompromised patients. HMPV infection is most common during the winter and it is believed to cause up to 10% of respiratory illnesses in children.

"HMPV was first discovered in 2001, but studies have shown that the virus has been circulating in humans for at least 50 years," said Professor Dr Ron Fouchier from ErasmusMC in Rotterdam, The Netherlands. "HMPV is closely related to Avian metapneumovirus C (AMPV-C), which infects birds. Because of the similarity, scientists have suggested that HMPV emerged from a bird virus that crossed the species barrier to infect humans."

Metapneumoviruses have high evolutionary rates, similar to those of other RNA viruses such as influenza, hepatitis C and SARS. By understanding the evolution and emergence of these viruses the scientists hope to develop ways of monitoring and predicting the emergence of new pathogenic viruses.

"We investigated the evolutionary history of metapneumoviruses using genetic information available for numerous strains of HMPV and AMPV-C circulating in humans and birds," said Professor Dr Fouchier.

"We calculated that the moment of divergence between HMPV and AMPV-C occurred approximately 200 years ago. Therefore, HMPV probably originates from an AMPV-C like virus that crossed the species barrier to infect humans around that time."

"Besides the evolutionary history of metapneumoviruses, we also investigated the mutation rates and the selection pressures of these viruses. An understanding of how viruses evolve and how they adapt to new hosts and their immune systems is important, especially if we are to prepare for new, potentially pandemic diseases."

Journal reference:

1. de Graaf et al. **Evolutionary dynamics of human and avian metapneumoviruses**. *Journal of General Virology*, 2008; 89 (12): 2933 DOI: 10.1099/vir.0.2008/006957-0

Adapted from materials provided by Society for General Microbiology, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081120073115.htm

Ultrasound Waves Aid In Rapid Treatment Of Deep Vein Thrombosis

ScienceDaily (Nov. 30, 2008) — The use of ultrasound waves for deep vein thrombosis (DVT) may help dissolve blood clots in less time than using clot-busting drugs alone, according to researchers at Emory University. The study will be presented Nov. 23, 2008 at the annual VEITHsymposium in New York City.

"These clots are a main cause of both heart attacks and stroke and the more quickly you can eliminate them the better," says Karthikeshwar Kasirajan, MD, assistant professor of surgery in the Emory University School of Medicine.

A DVT is a blood clot that forms in a vein deep in the body, most often in the lower leg or thigh. A loose clot, called an embolus, can break off and travel through the bloodstream to the lungs and block blood flow. The life-threatening condition is called pulmonary embolism. The surgeon general's campaign estimates that every year, between 350,000 and 600,000 Americans get one of these clots - and at least 100,000 of them die.

"We now know that using ultrasound, along with the traditional method of using drugs to break up or dissolve blood clots, will help restore flow, prevent valve damage and also prevent the possibility of pulmonary embolism," says Kasirajan.

Researchers treated 37 patients with the clot-dissolving drug called tPA (tissue plasminogen activator), while using ultrasound to loosen the proteins in their blood clots and send the drug into the clots faster.

Of the 37, 16 had DVT and 21 had acute in-situ arterial thrombosis. All the patients with arterial thrombosis had their clots completely dissolved, and all but six of the DVT patients had theirs completely dissolved.

Four DVT patients had their clots partially dissolved and two saw no change. Only one of the 37 had a complication (neck hematoma). Most of the 37 (83 percent) were subsequently treated with angioplasty and stent placement.

Risk factors for DVT include: being immobile for long periods of time, recent surgery, a fall or broken bone, pregnancy, a car crash, birth control pills or menopause hormones. The risk rises with age, especially over 65, and among people who smoke or are obese.

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

http://www.sciencedaily.com/releases/2008/11/081123150253.htm

Climate Change Opens New Avenue For Spread Of Invasive Plants

Researchers compared exotic plant species that had recently established in Millingerwaard, a nature preserve in The Netherlands, with related native plant species from the same area. (Credit: iStockphoto/Ruud De Man)

ScienceDaily (Nov. 30, 2008) — Plants that range northward because of climate change may be better at defending themselves against local enemies than native plants.

So concludes a team of scientists including a University of Florida geneticist. The team's findings, reported online in the journal Nature, suggest that certain plants could become invasive if they spread to places that were previously too cold for them.

"This paper is the first to suggest that the mechanisms that aid invasive species when they move from one continent to the next may actually work within continents when climate change gradually extends the distributional range of a species," said Koen J.F. Verhoeven, an evolutionary biologist at The Netherlands Institute of Ecology. "Plants may be able to outrun, so to speak, their enemies from the southern range."

Often, exotic plants and animals are introduced to new continents or geographic regions by travelers and commerce. Separation from their natural enemies can drive their invasive success in the new range. But, increasingly, the distribution of many species is shifting because of climate change and changes in land use.

Led by scientists Tim Engelkes, Elly Morriën and Wim van der Putten of The Netherlands Institute of Ecology, with collaborators from the University of Florida, Wageningen University and Leiden University, the researchers compared exotic plant species that had recently established in Millingerwaard, a nature preserve in The Netherlands, with related native plant species from the same area.

"We set out to see whether the native and exotics responded differently to natural enemies such as herbivores or microorganisms in the soil," said Lauren McIntyre, an associate professor of molecular genetics and microbiology in UF's College of Medicine and a member of the UF Genetics Institute. "UF

helped develop a statistical model that took into account the experimental design and had good power to detect the effects of herbivory."

Scientists grew six exotic and nine native plant species in pots with field-collected soil from the Millingerwaard area, allowing natural soil pathogenic microbes to accumulate in the pots. Then they removed the plants and replanted the soils with the same plant species.

The growth of native plants was reduced far more than the growth of exotic species, indicating natives were more vulnerable to natural soil-borne microbes.

In addition, all plant species were exposed to North African locusts and a widespread species of aphid. These herbivores were not expected to show a preference for either the native or the exotic species. But they preferred the native plants and left the exotic ones relatively alone.

Researchers say the findings help to better assess the ecological consequences of climate change. The success of exotic plants expanding their range in response to warmer climates may be comparable to invasive exotic plant species that arrive from other continents, representing an additional threat to biodiversity.

Adapted from materials provided by University of Florida.

http://www.sciencedaily.com/releases/2008/11/081119161125.htm

Exercise And Rest Reduce Cancer Risk

ScienceDaily (Nov. 30, 2008) — Exercise is good for more than just your waistline. A recent study presented at the American Association for Cancer Research's Seventh Annual International Conference on Frontiers in Cancer Prevention Research suggests that regular physical activity can lower a woman's overall risk of cancer – but only if she gets a good night's sleep. Otherwise, lack of sleep can undermine exercise's cancer prevention benefits.

"Greater participation in physical activity has consistently been associated with reduced risk of cancer incidence at several sites, including breast and colon cancers," said James McClain, Ph.D., cancer prevention fellow at the National Cancer Institute and lead author of the study. "Short duration sleep appears to have opposing effects of physical activity on several key hormonal and metabolic parameters, which is why we looked at how it affected the exercise/cancer risk relationship."

Even though the exact mechanism of how exercise reduces cancer risk isn't known, researchers believe that physical activity's effects on factors including hormone levels, immune function, and body weight may play an important role. The study examined the link between exercise and cancer risk, paying special attention to whether or not getting adequate sleep further affected a women's cancer risk.

Researchers assessed the association between physical activity energy expenditure (PAEE), sleep duration and incidence of overall, breast, and colon cancer in 5,968 women at least 18 years old with no previous cancer diagnoses. The women completed an initial survey in 1998 and were then tracked through the Washington County Cancer Registry and Maryland State Cancer Registry for nearly 10 years.

The results pointed to a sleep-exercise link. "Current findings suggest that sleep duration modifies the relationship between physical activity and all-site cancer risk among young and middle-aged women," he said.

Out of those 5,968 women, 604 experienced a first incidence of cancer, including 186 breast cancer cases. Women in the upper 50 percent of PAEE showed significantly reduced risk of overall cancer and breast cancer. Among women 65 or younger when surveyed and in the upper half of PAEE, sleeping less than seven hours a day increased overall cancer risk, negating much of the protective effects of physical activity on cancer risk for this group.

The next step, says McClain, would be to confirm current findings and investigate potential mechanisms underlying the interaction between sleep and exercise in order to better understand their roles in cancer prevention.

Research is expanding rapidly on the effect of insufficient and prolonged sleep duration on many health outcomes although few studies have examined the association of sleep duration with cancer risk. This novel study examining the interaction of sleep and physical activity suggests another future focus of research on health behaviors and cancer outcomes.

Adapted from materials provided by American Association for Cancer Research.

http://www.sciencedaily.com/releases/2008/11/081117153154.htm

Sustainable Garden Roofs Developed As New Construction Material

ScienceDaily (Nov. 30, 2008) — A Spanish research study has tested different combinations of supports and indigenous plants to determine which are the best for reducing energy consumption inside buildings. This type of roof is a "rurban", sustainable architectural solution that will lead to a reduction in environmental and acoustic contamination levels in cities, and be visually pleasing.

Researchers from the Polytechnic University of Madrid (UPM) have built a roof covered with plants and a watering system that will optimise the consumption of a building's heating and cooling systems thanks to its insulation. It is a third-generation ecological roof, characterised by its sustainability and the use of indigenous plant species.

"The importance of the roofs", explained Francisco Javier Neila, Professor at the UPM and co-author of the study, to SINC, "is that each geographical area requires the structures and plant species that work best". In this case, the researchers divided the roof of an experimental building in Colmenar Viejo (Madrid) into 20 modules, and carried out a test with different supports and regional plants based on three factors: the plant growing at a good speed, the density of the biomass perfectly covering the roof and the result being visually attractive.

Indigenous species work better

In winter and summer conditions, the best performing roof has an 8 cm tank that collects rainwater and offers an even irrigation system.

Plants such as sedum (Sedum praealtum) or aptenia (Aptenia cordifolia) provide the best insulation "because they have a thick leaf and are resistant to frosts and heat", indicated Neila. But each location where an ecological roof is installed will have its own catalogue of plants, starting with indigenous plants "because in its habitat, the plant performs better".

The researchers also considered covering the roofs with an effective plant and decorating it with another prettier one to fulfil both requirements, but the result is difficult ,"since when a single space is shared by two species, the stronger one will predominate", Neila explained.

There are a series of superimposed layers under the groundcover. The first is a very light special substrate which helps to drain rainwater quickly so the plant does not drown. Here, the best solution is pine bark crushed and mixed with sewage sludge.

The substrate lies on porous concrete which acts as a sieve for excess water that will end up in the tank, the capacity of which is controlled by raised floor systems similar to those that support the raised floor of an office. The water contained rises up to the roof through capillary action and enables even irrigation. Just before the building's floor framing, the roof consists of a waterproof sheet which prevents leaks.

Between each layer an extruded polystyrene sheet is inserted which, according to the roof model, can be situated under the porous concrete or beneath the tank. Each layer also includes a sensor that measures temperature and humidity variables which can be compared with data collected by an adjoining weather station for checking any change caused by the roof during the four seasons of the year.

The researchers have also left various modules without an ecological roof to clearly demonstrate its effectiveness. "Roof areas with plants optimise better the heating and cooling of a building than a normal structure, regardless of how well insulated it is", the expert commented to SINC.

'Rurban movement'

The design of ecological roofs responds to the challenge of merging urban and rural lifestyles and is being developed in countries such as Germany, Switzerland, the USA and South Africa. Ecological roofs reduce pollution in cities, absorb lead and other organic components. “A forest would be less contaminated with the same intensity of urban pollution", said Neila.

These roofs will help to reduce the temperature of cities, which today are a kind of urban heat island. Scientists have also estimated that acoustic contamination would be reduced to three decibels, thanks to plant absorption.

Groundcover is therefore becoming a new type of building material but development prospects are not positive due to its high price. Neila cites Germany, “where the situation is being resolved with tax benefits, council taxes, increase in suitability for building, which means it does not cost developers so much to invest in this option”.

Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081121151914.htm

Science Professors Know Science, But Who Is Teaching Them How To Teach?

ScienceDaily (Nov. 30, 2008) — U.S. science and engineering students emerge from graduate school exquisitely trained to carry out research. Yet when it comes to the other major activity they'll engage in as professors – teaching – they're usually left to their own devices.

That's now beginning to change, thanks to work at the University of Wisconsin-Madison. In the Nov. 28 issue of Science, a team led by bacteriology professor Jo Handelsman describes its program of "scientific teaching," in which graduate students and postdoctoral researchers are taught to foster scientific inquiry by their students, accommodate diverse learning styles, and rigorously evaluate their teaching efforts.

True to the approach, they've now assessed whether participants are indeed learning the program's methods and principles, and the study indicates they're getting results.

"We've shown in this paper that training graduate students in teaching is feasible and that it works," says Handelsman, who leads UW-Madison's scientific teaching initiative with funding from the Howard Hughes Medical Institute. "It does have an impact on the way they think about teaching, their philosophy of teaching, and what they actually do in the classroom."

While the findings may sound obvious to some, programs that prepare science graduate students for teaching are still relatively rare, says Handelsman, despite repeated calls by the National Research Council and others for better education training for future professors. What's more, of the programs that do exist, none appear to have been studied as carefully as the UW-Madison initiative, known as the Teaching Fellows Program.

Filling a gaping hole in graduate education is thus one major benefit of well-tested programs like UW-Madison's. But the biggest winners will be the future generations of undergraduates who take science courses, says the paper's lead author Sarah Miller, who co-directs the Wisconsin Program for Scientific Teaching with co-author, Christine Pfund.

"This is all about the classroom of tomorrow," says Miller. "How do we make that classroom a place where every student who comes through the doors has a reason to be there, feels included and isn't just learning facts that you can find using Google? It's about thinking: How do we get our students to think?"

To accomplish this, scientific teaching mimics science itself in several critical ways. First of all, it teaches undergraduates skills like analytical thinking and experimental design, rather than having them simply memorize facts. It employs practices, such as active learning, based on the latest evidence from the education literature. And it strives to reach a diversity of students, "because that's one of the critical aspects of science," says Handelsman, "that we attract and retain people with different backgrounds, ethnicities and ways of thinking."

The approach has been honed over five years by Handelsman and her colleagues, based on both their own evolving knowledge of effective teaching methods and feedback from the program's more than 60 participants. But the team eventually decided this wasn't enough, says Miller. "We realized that we needed to demonstrate how the fellows were putting scientific teaching into practice."

To do so, the researchers collected both quantitative and qualitative data. Teaching units developed by the fellows were scored on criteria such as proof of active learning, methods that fostered discovery and a reflective approach to teaching. Fellows were asked to rate their level of skill as instructors at the end of the program. And co-author Christine Pribbenow, of the Wisconsin Center for Education Research, helped the group to analyze and compare teaching philosophies written by the participants at the program's beginning and nine months later.

The analyses uncovered ample evidence that the fellows were learning. Their teaching units, for example, were found to devote more than 66 percent of class time on average to active learning exercises. Three-quarters of the units also required students to learn aspects of scientific discovery, such as the scientific method or critical thinking. Moreover, Pribbenow's analysis of the teaching philosophies revealed a significant shift from a teacher-centered perspective at the start, to one more focused on the learner by the end.

The team is now planning a longitudinal study to see how taking part in the program affects the fellows' careers. But Handelsman hopes the current evidence by itself will convince people to invest in this neglected area of graduate education.

"I think it's really important to train graduate students in teaching," she says. "Not only do I think we have a responsibility to the next generation of professors, but also to society: all of the people who will be those professors' students."

Adapted from materials provided by University of Wisconsin-Madison, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081127145125.htm

2008 Atlantic Hurricane Season Sets Records

A total of 16 named storms formed this season, based on an operational estimate by NOAA's National Hurricane Center. The storms included eight hurricanes, five of which were major hurricanes at Category 3 strength or higher. (Credit: NOAA)

ScienceDaily (Nov. 30, 2008) — The 2008 Atlantic Hurricane Season officially comes to a close on November 30, marking the end of a season that produced a record number of consecutive storms to strike the United States and ranks as one of the more active seasons in the 64 years since comprehensive records began.

A total of 16 named storms formed this season, based on an operational estimate by NOAA's National Hurricane Center. The storms included eight hurricanes, five of which were major hurricanes at Category 3 strength or higher. These numbers fall within the ranges predicted in NOAA's pre- and mid-season outlooks issued in May and August. The August outlook called for 14 to 18 named storms, seven to 10 hurricanes and three to six major hurricanes. An average season has 11 named storms, six hurricanes and two major hurricanes.

"This year's hurricane season continues the current active hurricane era and is the tenth season to produce above-normal activity in the past 14 years," said Gerry Bell, Ph.D., lead seasonal hurricane forecaster at NOAA's Climate Prediction Center.

Overall, the season is tied as the fourth most active in terms of named storms (16) and major hurricanes (five), and is tied as the fifth most active in terms of hurricanes (eight) since 1944, which was the first year aircraft missions flew into tropical storms and hurricanes.

For the first time on record, six consecutive tropical cyclones (Dolly, Edouard, Fay, Gustav, Hanna and Ike) made landfall on the U.S. mainland and a record three major hurricanes (Gustav, Ike and Paloma) struck Cuba. This is also the first Atlantic season to have a major hurricane (Category 3) form in five consecutive months (July: Bertha, August: Gustav, September: Ike, October: Omar, November: Paloma).

Bell attributes this year's above-normal season to conditions that include:

- An ongoing multi-decadal signal. This combination of ocean and atmospheric conditions has spawned increased hurricane activity since 1995.
- Lingering La Niña effects. Although the La Niña that began in the Fall of 2007 ended in June, its influence of light wind shear lingered.
- Warmer tropical Atlantic Ocean temperatures. On average, the tropical Atlantic was about 1.0 degree Fahrenheit above normal during the peak of the season.

NOAA's National Hurricane Center is conducting comprehensive post-event assessments of each named storm of the season. Some of the early noteworthy findings include:

- Bertha was a tropical cyclone for 17 days (July 3-20), making it the longest-lived July storm on record in the Atlantic Basin.
- Fay is the only storm on record to make landfall four times in the state of Florida, and to prompt tropical storm and hurricane watches and warnings for the state's entire coastline (at various times during its August lifespan).
- Paloma, reaching Category 4 status with top winds of 145 mph, is the second strongest November hurricane on record behind Lenny in 1999 with top winds of 155 mph).

Much of the storm-specific information is based on operational estimates and some changes could be made during the review process that is underway.

Adapted from materials provided by National Oceanic And Atmospheric Adminstration.

http://www.sciencedaily.com/releases/2008/11/081129124902.htm

New Excavations Strengthen Identification Of Herod's Grave At Herodium

Collapse of architectural elements of Herod's mausoleum. (Credit: Image courtesy of Hebrew University of Jerusalem)

ScienceDaily (Nov. 30, 2008) — Analysis of newly revealed items found at the site of the mausoleum of King Herod at Herodium (Herodion in Greek) have provided Hebrew University of Jerusalem archaeological researchers with further assurances that this was indeed the site of the famed ruler's 1st century B.C.E. grave.

Herod was the Roman-appointed king of Judea from 37 to 4 B.C.E., who was renowned for his many monumental building projects, including the reconstruction of the Temple in Jerusalem, the palace at Masada, the harbor and city of Caesarea, as well as the palatial complex at Herodium, 15 kilometers south of Jerusalem.

On the basis of a study of the architectural elements uncovered at the site, the researchers have been able to determine that the mausoleum, among the remains of which Herod's sarcophagus was found, was a lavish two-story structure with a concave-conical roof, about 25 meters high – a structure fully appropriate to Herod's status and taste. The excavations there have also yielded many fragments of two additional sarcophagi, which the researchers estimate to have been members of Herod's family.

The mausoleum, says Prof. Ehud Netzer, director of the excavations, was deliberately destroyed by the Jewish rebels who occupied the site during the First Jewish Revolt against the Romans which started in about 66 C.E.

Also found in the latest excavations are the remains of an intimate theater just below and to the west of the mausoleum, with seats for some 650 to 750 spectators, and a loggia (a kind of VIP viewing and

hospitality room) located at the top of the theater seats and decorated with wall paintings and plaster moldings in a style that has not been seen thus far in Israel. The style is known to have existed in Rome and Campania in Italy and is dateable between 15 and 10 B.C.E. Thus far only one wall painting scene has been found intact, though there are traces of others in the room. .

The dating of the wall paintings makes it reasonable to assume, says Prof. Netzer, that the construction of the theater might be linked to Roman general and politician Marcus Agrippa's visit to Herodium in 15 B.C.E. The theater and its lavish loggia were deliberately destroyed for the creation of the conical artificial mount that constitutes the widely known popular image of the Herodium site and that apparently was built at the very end of Herod's reign.

Prof. Netzer is convinced that Herodium would never have been built had it not been for Herod's known determination, made at the beginning of his career, to be buried in this isolated, arid area. He undoubtedly personally chose the exact location for his mausoleum since it overlooks Jerusalem and its surroundings. This led to his decision to make the entire complex the "crowning glory" of his outstanding building career and to name it after himself.

The extensive site, which probably will not be fully excavated for many years to come, if ever, includes a huge palatial complex, the theater, and a "country club" of sorts, including a large pool, baths and gardens, in addition to Herod's burial installations and mausoleum. The palace was the largest of its kind in the Roman world of that time and must have attracted yearly hundreds, if not thousands, of guests, says Prof. Netzer.

A description of Herodium, as well as of Herod's funeral procession there, can be found in the writings of the ancient Roman-era historian, Flavius Josephus.

Working with Prof. Netzer at the site have been Yaakov Kalman, Roi Porath and Rachel Chachy-Laureys of the Hebrew University Institute of Archaeology. Restoration work of the coffins was carried out by Orna Cohen, and the laboratory of the Israel Museum helped with the consolidation of the wall paintings.

Prof. Netzer is hopeful that with the further findings at Herodium, there will be increased visits to the site by Israelis and tourists, and that the overall area might be converted into a national park.

The excavations, on behalf of the Institute of Archaeology of the Hebrew University of Jerusalem, have been conducted with the assistance of the Israel Exploration Society, with contributions by individuals and Yad-Hanadiv foundation. There also has been financial aid from the National Geographic Society. Also collaborating in the excavations are the Israel Nature and Parks Authority and the Gush Etzion Regional Council. The Israel Museum will launch in 2010 an exhibition of the findings there.

Shaul Goldstein, head of the Gush Etzion Regional Council, said that "the Gush Etzion Regional Council views the Herodium National Park as an important historic site worthy of great investment in order to assure its preservation. In recent years, the council has worked diligently in order to preserve and develop the site through the investment of millions of shekels, half of which has been devoted to the excavations by Prof. Netzer, and half in the development of the visitor facilities there. Additionally, the council also allocates significant sums every year in publicizing the site, along with the Nature and Parks Authority."

Adapted from materials provided by Hebrew University of Jerusalem, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081119084537.htm

Three Esophageal, Stomach Cancer Subtypes Linked To Smoking; One Associated With Alcohol Use

ScienceDaily (Nov. 30, 2008) — Researchers who have been following the health of more than 120,000 residents of the Netherlands for more than two decades have found that smoking is associated with two forms of esophageal cancer as well as a form of stomach cancer, and that drinking alcohol is strongly linked to one form of esophageal cancer.Researchers say that while their findings, presented at the American Association for Cancer Research's Seventh Annual International Conference on Frontiers in Cancer Prevention Research, confirm risk factors previously associated with these cancers, they don't explain the rising incidence of these tumors, especially esophageal adenocarcinoma (EAC) and gastric cardia adenocarcinoma (GCA), a cancer of the upper stomach area, where it joins the esophagus.

"The results of this study again confirm recommendations for a healthy lifestyle, namely not to smoke and to drink alcohol in moderation," said study author, Jessie Steevens, M.Sc., of the Department of Epidemiology at Maastricht University, in Maastricht. "But it also suggests that there must be other risk factors for EAC and GCA," she said. "Smoking is a risk factor for both cancers, but since a decreasing part of the population smokes, this cannot explain why the incidence is rising so rapidly for both cancers in Western countries in recent decades."Other factors that might be associated with the risk of these cancers include obesity, diet and nutrition, exercise, occupational exposures, medical factors and so forth, which we are beginning to study," Steevens said.Their findings are from one of the first large cohort studies to investigate risk factors in esophageal adenocarcinoma and gastric cardia adenocarcinoma, as well as in esophageal squamous cell carcinoma (ESCC), which resembles head and neck cancer.ESCC, which can occur anywhere along the esophagus, was at one time responsible for more than 90 percent of all esophageal cancers, but now EAC, which is typically found in the lower esophagus, makes up more than half of this cancer type. Esophageal cancer, in general, had been linked to alcohol and tobacco use, but this study sought to refine that risk between different cancer subtypes.

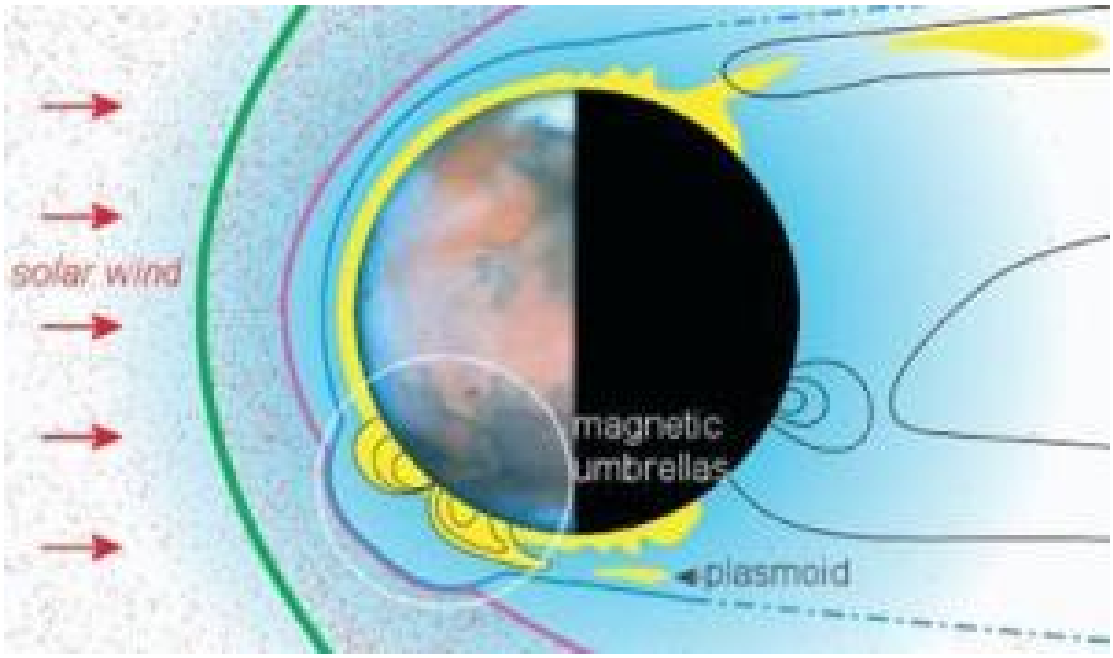
Researchers in the Netherlands Cohort Study, which began in 1986, administered lifestyle questionnaires to participants, who were healthy when they enrolled, and then followed the group to see who developed cancer. After 16 years, investigators identified 120 ESCC cases, 168 EAC cases, and 187 GCA cases among the group of 120,852 enrollees.For esophageal squamous cell carcinoma, they found a dose-response relationship between alcohol use and cancer development. "For example, a person drinking four glasses of alcohol had five times the risk of developing the cancer compared to a person who does not drink alcohol," Steevens said."Another way to explain this is that a person's lifetime risk of developing ESCC is one in 250 if that person doesn't drink alcohol and the lifetime risk would be about one in 50 if the person drinks four glasses of alcohol per day," she said.Former and current smoking was associated with an increased risk of all three cancers, although the risks of ESCC were higher than those of EAC and GCA.

"It appeared that current smokers have the highest risks, and former smokers have an intermediate risk compared with never smokers. This was true for ESCC, EAC and GCA. These are the results when no other aspects of smoking were considered, such as the amount of cigarettes smoked per day and the number of years a person smoked," Steevens said. "When we took into account the smoking duration and frequency, it appeared that the difference in risk between former smokers and current smokers could partly be explained by these other aspects of smoking. This is also logical, because a former smoker, for example, has usually smoked fewer years than a current smoker."

Adapted from materials provided by American Association for Cancer Research, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081117103649.htm

Solar Wind Rips Up Martian Atmosphere



Solar wind blowing against Mars tears atmosphere-filled plasmoids from the tops of magnetic umbrellas. (Credit: Graphic artist Steve Bartlett)

ScienceDaily (Nov. 29, 2008) — Researchers have found new evidence that the atmosphere of Mars is being stripped away by solar wind. It's not a gently continuous erosion, but rather a ripping process in which chunks of Martian air detach themselves from the planet and tumble into deep space. This surprising mechanism could help solve a longstanding mystery about the Red Planet.

"It helps explain why Mars has so little air," says David Brain of UC Berkeley, who presented the findings at the 2008 Huntsville Plasma Workshop on October 27th.

Billions of years ago, Mars had a lot more air than it does today. (Note: Martian "air" is primarily carbon dioxide, not the nitrogen-oxygen mix we breathe on Earth.) Ancient martian lake-beds and river channels tell the tale of a planet covered by abundant water and wrapped in an atmosphere thick enough to prevent that water from evaporating into space.

Some researchers believe the atmosphere of Mars was once as thick as Earth's. Today, however, all those lakes and rivers are dry and the atmospheric pressure on Mars is only 1% that of Earth at sea-level. A cup of water placed almost anywhere on the Martian surface would quickly and violently boil away—a result of the super-low air pressure.

So where did the air go? Researchers entertain several possibilities: An asteroid hitting Mars long ago might have blown away a portion of the planet's atmosphere in a single violent upheaval. Or the loss might have been slow and gradual, the result of billions of years of relentless "sand-blasting" by solar wind particles. Or both mechanisms could be at work.

Brain has uncovered a new possibility--a daily ripping process intermediate between the great cataclysm and slow erosion models. The evidence comes from NASA's now-retired Mars Global Surveyor (MGS) spacecraft.

In 1998, MGS discovered that Mars has a very strange magnetic field. Instead of a global bubble, like Earth's, the Martian field is in the form of magnetic umbrellas that sprout out of the ground and reach beyond the top of Mars' atmosphere. These umbrellas number in the dozens and they cover about 40% of the planet's surface, mainly in the southern hemisphere.

For years, researchers thought the umbrellas protected the Martian atmosphere, shielding pockets of air beneath them from erosion by the solar wind. Surprisingly, Brain finds that the opposite can be true as well: "The umbrellas are where coherent chunks of air are torn away."

Addressing his colleagues at the Workshop, he described how he made the discovery just a few months ago:

Brain was scrolling through archival data from Global Surveyor's particles and fields sensors. "We have measurements from 25,000 orbits," he says. During one of those orbits, MGS passed through the top of a magnetic umbrella. Brain noticed that the umbrella's magnetic field had linked up with the magnetic field in the solar wind. Physicists call this "magnetic reconnection."

What happened next is not 100% certain, but Global Surveyor's readings are consistent with the following scenario: "The joined fields wrapped themselves around a packet of gas at the top of the Martian atmosphere, forming a magnetic capsule a thousand kilometers wide with ionized air trapped inside," says Brain. "Solar wind pressure caused the capsule to 'pinch off' and it blew away, taking its cargo of air with it." Brain has since found a dozen more examples. The magnetic capsules or "plasmoids" tend to blow over the south pole of Mars, mainly because most of the umbrellas are located in Mars' southern hemisphere.

Brain isn't ready to declare the mystery solved. "We're still not sure how often the plasmoids form or how much gas each one contains." The problem is, Mars Global Surveyor wasn't designed to study the phenomenon. The spacecraft was only equipped to sense electrons, not the heavier ions which would make up the bulk of any trapped gas. "Ions and electrons don't always behave the same way," he cautions. Also, MGS sampled the umbrellas at fixed altitudes and at the same local time each day. "We need to sample many altitudes and times of day to truly understand these dynamic events."

In short, he told the audience, "we need more data."

Brain is pinning his hopes on a new NASA mission named MAVEN. Short for "Mars Atmosphere and Volatile Evolution," MAVEN is an upper atmosphere orbiter currently approved for launch to Mars in 2013. The probe is specifically designed to study atmospheric erosion. MAVEN will be able to detect electrons, ions and neutral atoms; it will be able to measure both magnetic and electric fields; it will travel around Mars in an elliptical orbit, piercing magnetic umbrellas at different altitudes, angles, and times of day; and it will explore regions both near and far from the umbrellas, giving researchers the complete picture they need.

If magnetized chunks of air are truly being torn free, MAVEN will see it happening and measure the atmospheric loss rate. "Personally, I think this mechanism is important," says Brain, "but MAVEN may yet prove me wrong."

Meanwhile, the Mystery of the Missing Martian Air is shaping up to be a ripping good yarn.

Adapted from materials provided by Science@NASA. Original article written by Dr. Tony Phillips.

http://www.sciencedaily.com/releases/2008/11/081123142222.htm

Crumbling South Bronx as a Muse

By RANDY KENNEDY

When Ray Mortenson first started taking his cameras through the most wasted of the wastelands that made up parts of the South Bronx in the early 1980s, he devised a helpful subway mantra: Take the 5, stay alive. Take the 4, dead for sure.

This was only because the No. 5 line led through a handful of neighborhoods — East Tremont, Mott Haven, Morrisania — that had been so gutted and burned out during the 1970s that whole blocks were almost completely abandoned, meaning fewer chances of stumbling into a mugger or drug deal.

As a sculptor and photographer, Mr. Mortenson began making these Bronx trips because he was interested in the purely physical and visual characteristics of a once dense, elegant urban landscape that had come to look like excavated Pompeii or Dresden after the firebombs. Not that he would have ever wanted part of his city to endure the kind of devastation it did, but once the South Bronx reached that state he approached it aesthetically, as a “hard-art project.”

“I like being here,” he wrote. “I like the way it looks.”

Mr. Mortenson’s rarely exhibited black-and-white photographs, made between 1982 and 1984, are such powerful artifacts of their era that they have always struggled against being pulled into the documentary realm. And now, in a show of the pictures at the Museum of the City of New York called “Broken Glass” — the title is a line borrowed from the lyrics of the Grandmaster Flash classic “The Message” — the pictures have the added resonance of appearing as the nation confronts its most serious economic crisis since the Great Depression, making them feel like a kind of augury.

“You hear about this happening now in suburban places hit by foreclosures — empty houses, windows going broken, swimming pools filling up with trash,” Mr. Mortenson said in a recent interview at the museum.

When he began taking the pictures, he was working as an electrician and engaged by the ideas of artists like Robert Smithson and Gordon Matta-Clark, whose explorations of urban decay and entropy had made America's crumbling infrastructure into a new canvas for art.

In the late 1960s Smithson photographed the industrial ruins around his birthplace, Passaic, N.J., christening them as monuments. In the early 1970s Matta-Clark staged illegal "interventions" in some of the same Bronx neighborhoods that Mr. Mortenson was to visit, slicing whole sculpturelike sections from the floors and walls of abandoned tenements.Mr. Mortenson's first photographic explorations of this sort took him to the Meadowlands in New Jersey, where nature and industrial decay met in epic combat. Toward the end of the years he spent exploring the swamps he began taking the elevated subway lines through the Bronx and looking out at the rubble that many neighborhoods had been reduced to. As a child growing up in Delaware, he loved spending time alone walking through forests and fields, and he said he thought of the Meadowlands and then the Bronx in the same way.

"I could spend hours walking around some blocks without seeing anyone," he said. He would wander around Charlotte Street, one of the South Bronx's bleakest, which President Jimmy Carter had made infamous in a 1977 visit. (It is now in a suburblike neighborhood of neat single-family homes built not many years after Mr. Mortenson's photographs were taken.) He would walk through dozens of buildings that seemed to have been abandoned overnight, with coats still hanging on closet doors and furniture still in the living rooms. But the elements had begun to creep in through the broken windows, peeling the paint and causing ceiling plaster to rain down on the floors.

Mr. Mortenson, now 64, began shooting inconspicuously, wearing a beaten-up Army jacket, with a rolled-up New York Post under his arm and a 35-millimeter camera in his pocket. But as he began to learn the neighborhoods, spending sometimes 12 hours a day there during long summer days, he started to lug around a big, boxy view camera. He would set it up on the streets or inside abandoned apartments on a tripod to make exposures sometimes lasting as long as 10 minutes.

"I'd set up the shot and open the lens and then just walk around the building, exploring, until it was done," he said.Occasionally he ran into other human beings. Once he was surrounded by drug dealers, who demanded his film, and in the darkness of some buildings he would almost stumble over scavengers ripping out copper wiring and pipes. "You really had a heart attack when that happened," he said, "and I'm sure those guys were having a heart attack too."

In contrast to the work of photographers who have concentrated on urban decay from a more sociological perspective, like Camilo José Vergara, or even from an activist standpoint, like Mel Rosenthal, who was shooting the South Bronx at the same time, Mr. Mortenson's pictures are devoid of people or even cars. Other than notations of the day they were shot, there is no information accompanying them. "I wasn't carrying a notebook or even a map," he said. "I was just going where my eye took me."Sean Corcoran, the curator of prints and photographs at the Museum of the City of New York, said he was drawn to the images in part because of the tension in them between art and history. "The act of framing and capturing an image from the world is inherently transformative," he wrote in the catalog for the show, which runs through March 8. "Yet the pictures also provide an important record of a moment in time."

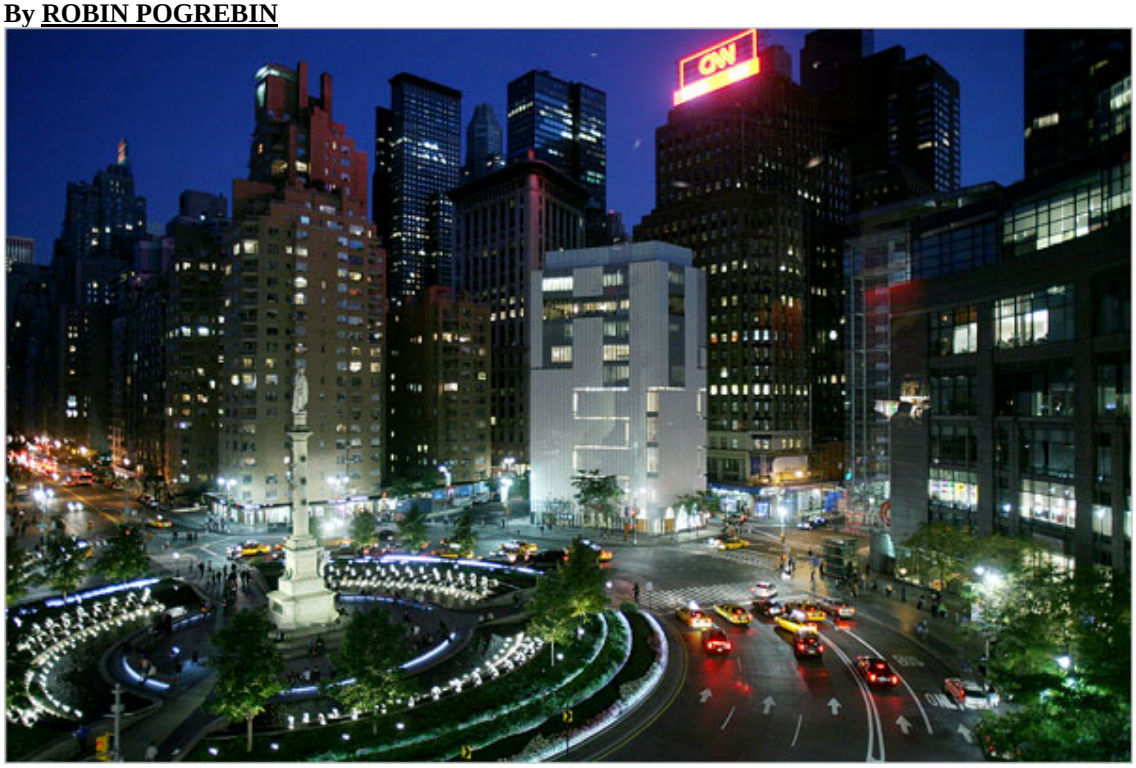
Mr. Corcoran writes that they insistently ask the question: "How could things get to this point? What political, economic and cultural shifts could lead to such a collapse?"Mr. Mortenson said he had not returned to those blocks since he stopped taking photographs in the Bronx in 1984. "I'm ambivalent about it," he said. "There was something about being there alone, about that time, that I guess I want to keep."

"It was kind of like being in a horror movie," he added. "But that was all part of it."

http://www.nytimes.com/2008/12/01/arts/design/01brok.html?_r=1&th&emc=th

Preservation and Development, Engaged in a Delicate Dance

By ROBIN POGREBIN



The battle lines were familiar. Churning out petitions and clamoring at hearings, hundreds of city residents had mobilized to protest a plan by St. Vincent's Hospital to replace nine buildings in the Greenwich Village Historic District with a 20-story medical center and condominiums.

On the other side were the Rudin Management Company, one of the city's largest developers, and St. Vincent's, which argued that a new building and income from the condo deal were vital to saving the hospital and meeting Manhattan's health needs.

In the middle, as usual, was the Landmarks Preservation Commission, which was struggling this year to make a judgment call under the klieg lights as city politicians took positions for and against.

Over a decade of whirlwind development, the Landmarks Preservation Commission has repeatedly played dance partner to a potent mix of preservationists, developers and city politicians. It must strike a balance between protecting architecture and accepting economic realities, between a responsibility to history and a knowledge that the city must evolve.

"It's the way government is," said Robert B. Tierney, an appointee of Mayor Michael R. Bloomberg who has been the chairman of the landmarks commission since 2003. "It's making choices and, without unlimited resources, having to make those choices and being able to do some things and not do other things."

In the case of St. Vincent's, the commission initially rejected the hospital's plan, objecting to the height and bulk of the new buildings and invoking the aesthetic value of the old ones. Then St. Vincent's reduced the scale of its project and resubmitted an application for permission to demolish the O'Toole building, the likely site for the new 20-story medical tower, citing financial hardship. A distinctive,

sawtooth-sided low white 1964 structure on Seventh Avenue between 12th and 13th Streets, the O'Toole is valued by many Village residents and devotees of midcentury Modernism.

Riven on the issue, the commission assented to its demolition last month in a 6-to-4 vote.

Further approval is still needed from city and state agencies.

"This is the real world, where there are pressures," said Christopher Moore, who voted with the majority and has served as a commissioner since 1995. "And sometimes you have to give squares to get squares."

Yet some preservationists and politicians assert that, under a mayoral administration that has emphasized new construction — from behemoth stadiums to architecturally bold condo towers — big developers have too often been allowed to lead on the dance floor. Some accuse the landmarks commission, charged with guarding the city's architectural heritage, of backing off too readily when important developers' interests are at stake.

"The real estate industry controls the agenda in the city," said Tony Avella, a city councilman from Queens. "If they don't want something to happen, it doesn't happen. They pull the strings from behind the scenes, whether in rezoning reform or landmarking. It's just incredible how much influence they have."

"The direction comes from the mayor, and the mayor's pro-development," Mr. Avella added.

Patricia E. Harris, the first deputy mayor, who oversees the commission, counters that the administration has been vigilant in protecting the city's landmarks. "We don't think about development without thinking about preservation," she said in an e-mail message. (She agreed to reply only to questions submitted in writing.) "During a time of unprecedented growth, preservation has always been front and center."

Even as preservationists argue that development has trumped preservation under Mayor Bloomberg, some architectural historians suggest that the traditional divide between the two should be rethought.

Preserving sections of old New York can actually spur economic renewal, they say, citing areas like TriBeCa, where the designation of a new historic district in 1992 accelerated the area's transformation into one of the city's most sought-after neighborhoods.

"There hasn't been enough attention to how new development can work with old buildings," said Andrew S. Dolkart, the director of the historic preservation program at Columbia University. "That's the biggest flaw in New York and preservation in the last decade — it's just ignored. All things considered, a relatively tiny proportion of New York land is landmarked. It's hardly an obstacle to economic growth in the city."

Developers tend to disagree. "Landmarking is one of the best tools that anti-development people have in this city — it's a very long, political process," said Jed Walentas, vice president of Two Trees Management Company, which as the main property owner in Dumbo has led that neighborhood's transformation from an industrial district into an upscale Brooklyn neighborhood. Last December the area was named a historic district by the landmarks commission.

Some developers accuse preservationists of routinely fighting development even when the buildings or districts are of questionable importance.

"I am pro-landmark, but I do think it is abused considerably," said Martin J. McLaughlin, a leading city lobbyist, who has represented developers before the commission. "It's too easy to say, 'The big bad developers.' There are big bad developers, but you're not supposed to use landmarks to stop development."

Both developers and preservationists try to enlist their local City Council members in fighting for or against potential landmarks. The council is often a pivotal player, since it must approve any designation and can overturn a landmarks commission decision.

In October 2005, for example, the Council vetoed the designation of the Jamaica Savings Bank building in Elmhurst, Queens, built in 1968 with striking geometry, and Cass Gilbert's 1913 Austin, Nichols waterfront warehouse in Williamsburg, Brooklyn, an Egyptian Revival structure that is being remade into luxury apartments.

Often developers and building owners make campaign contributions to City Council members during a designation process. Developers have also spent considerable sums on lobbying the landmarks commission, along with other city agencies.

In 2004 Greenwich Village preservationists enlisted the support of Christine C. Quinn, who represented the area on the City Council and is now Council speaker, in their fight to extend the existing historic district. The original 1969 designation had omitted the far west Village, home to many 19th-century converted loft buildings, row houses and other low-rise structures evoking the area's industrial and maritime past. Since the 1980s, 16 residential high rises had been built in the neighborhood, and more were in the works.

A formal request was filed in October 2004 with the landmarks commission seeking an extension that stretched to the Hudson River.

But as the commission defined the extension's boundaries, some village residents were distressed by the omission of two historic buildings: the Superior Ink building, built in 1919 as a Nabisco cracker bakery with twin tall smokestacks, and Whitehall Storage, a four-story 1938 building with ribbons of casement windows — among the last operating factory buildings along the river.

Meanwhile, developers made their own efforts in hearings, private meetings and letters to persuade the commission to leave their properties out or not to extend the district at all. The Witkoff Group was planning to build a 15-story residential tower atop Whitehall Storage; Related Companies wanted to raze Superior Ink and build a condo tower and town houses.

In May 2006 the commission approved the extension of the historic district, but excluded Superior Ink and Whitehall Storage. For preservationists the victory was bittersweet. "The Superior Ink building was really iconic to us, part of a broader complex of factories," said Andrew Berman, executive director of the Greenwich Village Society for Historic Preservation. "We thought it was a really important piece of the neighborhood to hold onto."

Today a 17-story luxury condo tower called Superior Ink and a row of Neo-Classical town houses are rising on the site at West and Bethune Streets.

Mr. Tierney, the landmarks commission chairman, said that Superior Ink was left out not because of development pressures, but because it "wasn't contiguous with the historic district."

"It was a question based on the merits, and how it connects to the rest of the district and what the other competing priorities are," Mr. Tierney said.

Related Companies and its chairman and chief executive, Stephen M. Ross, declined to be interviewed for this article. The Witkoff Group did not respond to messages seeking comment.

Donald G. Presa, a commission researcher for 22 years, said he and his colleagues do not consider development interests when drawing up boundaries. “That’s not an issue that the staff deals with,” he said. “We don’t consider that at all.”

He added that defining boundaries was a fraught task that staff members approach carefully. “Very few districts have natural boundaries,” Mr. Presa said. “We agonize so much about where to end a district. You have to draw the boundary line somewhere, or all of New York becomes an historic district.”

The commission has occasionally directly stood up to developers; it recently sent the real estate magnate Aby Rosen back to the drawing board with the architect Norman Foster on a proposal to build a 30-story tower over the Parke-Bernet Gallery building, at 980 Madison Avenue, at 76th Street, on the Upper East Side. Residents protested the project, and the commissioners deemed its scale out of character with the rest of the neighborhood. The agency has yet to vote on Mr. Foster’s revised design.

Yet the commission is faulted for refusing to schedule public hearings on some of the most fiercely contested projects, like Ward’s Bakery, an imposing terra-cotta-tiled structure that lay within the 22-acre footprint of the Atlantic Yards project in Brooklyn. In 2006 the commission’s staff determined that the building was not eligible for a hearing on landmark designation. Yet it had won a listing in 2003 on the National Register of Historic Places. Forest City Ratner tore down the bakery last year.

“This appears to be a political decision by the landmarks commission,” Daniel Goldstein, a spokesman for the group Develop Don’t Destroy Brooklyn, was quoted as saying at the time. “It is deeply frustrating that they have let politics enter their deliberation on a building that clearly deserves landmark status.”

A commission spokeswoman said of the bakery, “There are many other industrial structures like it around the city, and it had several branches throughout the city.”

Most notably, the landmarks commission was accused of succumbing to political and development pressures when it refused to schedule a public hearing on 2 Columbus Circle, the 1964 building by Edward Durell Stone known for its Venetian-style touches, portholes and “lollipop” columns. After a sweeping redesign by the architect Brad Cloepfil, the building reopened in September as the new home of the Museum of Arts and Design.

A Freedom of Information request in 2004 by Landmark West!, a preservation group, brought to light e-mail exchanges between Mr. Tierney and Laurie Beckelman, a former landmarks commission chairwoman who led the museum’s effort to buy 2 Columbus Circle from the city.

The day after Community Board 5 voted in favor of the city’s sale of the building, Ms. Beckelman wrote: “We got the vote 18-8, but I see trouble ahead. Thanks for all of your support.”

Mr. Tierney replied: “Let me know how I can help on the trouble ahead. Bob.”

Landmark West! filed a lawsuit accusing Mr. Tierney of collusion and seeking his removal from any decision on 2 Columbus Circle. The case was dismissed in September 2005.

Complicating the dance, the big players sometimes change sides.

Robert A. M. Stern, dean of the Yale School of Architecture and former head of the historic preservation program at Columbia University, for example, was among the most prominent defenders of 2 Columbus Circle. He not only faulted the city and the art museum for their decision, but also criticized Mr. Cloepfil for accepting the commission.

"I find it hard to believe that any architect can't be a preservationist," he said in a recent interview. "Picasso didn't say, 'I don't like Goya,' in fact the opposite: he said, 'I'm going to learn from Goya and Velásquez and other artists.' "

Yet Mr. Stern was also the architect behind the soaring condo developments made possible by the razing of Superior Ink in the West Village and the Dakota Stables on Amsterdam Avenue at 77th Street.

Asked whether he saw a contradiction in his stance, Mr. Stern said: "I've made judgments. Some buildings are not worth saving."

As for the landmarks commission's judgments about which buildings are worth saving, preservationists suggest that the current economic slump may prompt frank discussion in the city of what was sacrificed in a decade-long boom without a hearing by the agency.

"They really need to look at a way to be more forthcoming, more explanatory, so you could at least understand their reasoning," Peg Breen, the president of the advocacy group New York Landmarks Conservancy, said of the preservation commission.

Without that, she said, "It opens them to never-ending argument."

http://www.nytimes.com/2008/12/02/arts/design/02landmarks.htmlg

The Pursuit of Expansiveness Guides the Capitol's New Visitor Center

By EDWARD ROTHSTEIN

WASHINGTON — Standing in the middle of Emancipation Hall — the expansive lobby of the new Capitol Visitor Center that opens here on Tuesday — you can see why the construction of this underground addition to the United States Capitol ran so heftily over its budgeted time and money. The center's 580,000 square feet cost $621 million — more than double the planned amount. The ceremonial groundbreaking was in 2000.

The hall itself is a vast 20,000-square-foot marble-floored plaza with statues standing at its sides, an eccentric collection that includes the gold-draped figure of Kamehameha I (an 18th-century Hawaiian warrior and king) and the space-suited figure of John L. Swigert Jr. (a Colorado-born astronaut on Apollo 13). A towering plaster model for the bronze Statue of Freedom that was mounted on the building's dome 145 years ago on Tuesday stands ceremoniously at the entrance to a 16,500-square-foot exhibition about the history of Congress and the Capitol.

In Emancipation Hall everything seems as oversized as the 19-foot-tall Rococo Statue of Freedom. This has been the largest project in the Capitol's long history of expansions, many of which were accompanied by their own budget overruns and controversies. This one grew to incorporate additional security requirements and Congressional offices, under the direction of the Architect of the Capitol, Alan M. Hantman, who retired in 2007.

The new center — which is now where tourists will first arrive to visit the Capitol — has more than doubled the building's footprint and is expected to increase its annual visitors to more than three million. And though the center, designed by RTKL Associates, has been constructed underground in an attempt to

preserve Frederick Law Olmsted's 1874 landscaping that treats the Capitol, in his words, as a "great national monument," Emancipation Hall is still 36 feet high — or low, rather — and daylight streams in from skylights. Through one you can see the dome of the mother ship.

But the one thing that you don't feel here is what the place so insists on: that this is an extension of the Capitol and a suitable entrance into it. The sandstone used on the center's walls was deliberately chosen for its imperfections and discolorations so it would resemble the sandstone used in the Capitol's grand rotunda of 1824 (which was originally meant to be painted over); but that is paying attention to the trees rather than the forest. Despite the informative exhibition, in many ways — physically, conceptually and politically — Emancipation Hall is the inversion of the Capitol's glorious rotunda where visitors were once led to begin sampling the poised grandeur of this place.

That inversion is so strange it almost overshadows the fact that something like this center was a necessity. The visitor entrance to the Capitol turned into a choke point once security became a major issue, not just because of the 9/11 attacks but also after the killings in 1998 by a deranged man who walked through the main doors and began shooting. A visitor center was also needed to satisfy the demands of contemporary tourism: plentiful bathrooms (26 here), a restaurant (with 530 seats), an indoor lobby where large crowds (up to 4,000 people) could be channeled into smaller spaces and gift shops.

Something more informative was also needed to supplement the traditional tours of the Capitol's public spaces (visits to Congressional sessions must be separately arranged through senators and representatives). So the overall plan — an introductory film, a tour of the Capitol, a visit to the exhibition, all the amenities — makes a lot of sense.

But if you go on one of those tours, you can see how different the center is from its origins, from the smallest detail to the largest. The rotunda is modeled on the Roman Pantheon, while overhead, on its great dome, is a fresco, "The Apotheosis of George Washington," in which the divine figures of Fame and Liberty accompany Washington's rise to immortal stature. In that space and in others that still draw gasps, you can sense the kind of ambitions that lay behind the building.

In the building's mixture of plain functionality and elaborate decoration you can feel the tension the place represents, trying to combine democratic sensibility and noble sentiments, principles of equality and high aspiration. The Capitol was a pioneering effort — the first, perhaps, since the ancient world — to strive for something like democratic splendor.

Like a medieval cathedral it has also taken centuries to evolve, not without controversy, over the course of its many reconstructions and expansions. The same effort is knit into the history of the country itself, its flaws and virtues visible like the veins of the building's sandstone.

Alluding to such themes, perhaps, the Visitor Center calls its display of historic documents (which will be rotated every six months) a "Wall of Aspirations" because it highlights Congressional efforts to move the country "toward a more perfect Union." Now the wall includes Thomas Jefferson's letter to Congress asking it to finance the Lewis and Clark expedition, a ceremonial copy of the 13th Amendment abolishing slavery, and John F. Kennedy's speech to Congress promising a manned Moon landing within a decade.

The exhibition itself, designed by Ralph Applebaum Associates, is deft and informative, offering capsule civics lessons in two films about both houses of Congress (along with television monitors that show Congress when it is in session), a stunning 11-foot-high model of the Capitol's rotunda and dome, models showing Capitol Hill's evolution, and interactive screens giving virtual tours of the Capitol's more elaborate rooms closed to the public. Displays survey the history, incorporating relics like the trowel used by Washington when laying the Capitol cornerstone in 1793, the table used at Abraham Lincoln's Second Inaugural and an electronic ballot box used by the House of Representatives in the early 1970s.

In many ways the history of Congress resembles the history of the country it governs: leaders or tyrants pushing at the limits of power (like the Speaker of the House Joseph G. Cannon at the turn of the 20th century, or Sen. Joseph McCarthy in the early 1950s), rivals confronting each other, advocates championing populism and democratic sensibility. In its survey this exhibition seems to build toward a celebration of inclusion, drawing attention to Hattie Caraway of Arkansas, for example, as the first woman elected to the Senate, in 1932, or Dennis Chavez of New Mexico, "the first Hispanic elected to both houses of Congress." But the effect is of an epic history of struggles too large to be fully told here, many of which continue.

Unfortunately the exhibition's effect is dwarfed by Emancipation Hall, which dissolves any sense of drama. Its name is a tribute to the slaves who built the Capitol in its earliest incarnations, but the hall doesn't give a hint of the nature of liberty, the struggles needed to achieve it, or the magnificence of the accomplishment. It is like a characterless way station hoping to achieve with expanse what it cannot achieve with thought. The center's 24 statues (taken from Congress's collection of two from each state) also testify not to the largest national perspective, but the most particular and peculiar interests. The figures include Philo T. Farnsworth of Utah, the "father of television"; Jeannette Rankin of Montana, who, in the House, cast the lone vote against war with Japan after Pearl Harbor; and Ephraim McDowell of Kentucky, a surgeon who helped draft his state's constitution.

Such demographically chosen figures, of course, are part of the national story; some may even deserve tribute. But none deserve apotheosis, and in the new welcoming space of the Capitol, they are woefully out of place. They reflect not aspiration but accommodation. They are individuals in a clamoring crowd.

That is one vision of democracy, and it may even reflect what visitors will feel like in this vast and undistinguished hall. But in contrast, within the Capitol itself, that clamor is hushed with purpose.

The Capitol Visitor Center opens on Tuesday on Capitol Hill at the east end of the Mall in Washington; (202) 225-6827; visitthecapitol.gov.

http://www.nytimes.com/2008/12/02/arts/design/02visi.html?ref=design

Rescuing a Landmark From Time and the Elements

By EVE M. KAHN

Flames, seahorses, octopuses and sunbeams made of plaster intertwine on the walls and ceiling of the old sculpture studio that sits in the backyard of the New York Studio School of Drawing, Painting and Sculpture, just north of Washington Square Park.

But all that supports the molded plaster at this national historic landmark are tired nails and inertia. Despite its forlorn condition, the 90-year-old studio certainly deserves its landmark status — it belonged to Gertrude Vanderbilt Whitney, the sculptor, art collector, member of two vaunted New York families and, most important, the founder of the Whitney Museum of American Art, which originally occupied the building that now houses the school.

The studio's falling-down state has forced the school, at 8 West Eighth Street, to shut down its longtime public tours of Mrs. Whitney's workroom.

"This beautiful historic space is relatively intact, but in a state of disrepair, with worrisome cracks," said Betsy Davidson Pickering, the school's director of external affairs and development. To top it off, a two-foot-square corner of the ceiling in Mrs. Whitney's studio, now used as a classroom, collapsed in March.

"The entire armature holding up the ceiling is rusted," said Wesley Haynes, a preservation specialist with Kaitsen Woo Architect who examined the room soon after the chunk fell. "We didn't see anything that suggested catastrophic failure, but it's just a matter of time."

Help is on the way, however. This month, as a result of a $50,000 grant from the World Monuments Fund, the Manhattan preservation firm Integrated Conservation Resources will start stabilizing the delicate crumbling corner with vegetable-fiber paper, acrylic adhesive and temporary beams.

Early next year, students of historic preservation from the University of Pennsylvania will look for other endangered areas in the room and determine what it looked like when Mrs. Whitney commissioned its décor in 1918 from Robert Winthrop Chanler, a friend and fellow sculptor.

“Hardly anyone’s heard of him anymore, but he was an incredibly important, fascinating character, with a style that can’t be classified,” said Morris Hylton, a preservation consultant to the school. Mr. Chanler, a scion of the Astor family, frittered away much of his inheritance while romancing divas (including Isadora Duncan and the opera singer Lina Cavalieri) and creating portraits, murals, bas-reliefs and stained-glass windows for fellow bluebloods like the Vanderbilt and Harriman families. Mr. Chanler specialized in swirls of fauna: For Mrs. Whitney’s studio on Eighth Street, he complemented the sculpted plaster with cobalt-blue windows depicting bats, fish and dragons amid seaweed and constellations.

Mrs. Whitney combined adjacent town houses to create her Whitney Museum of American Art, which moved uptown in 1954. By the time the Studio School bought the compound, in 1967, the studio had been whitewashed and the Chanler windows torn out. Although the school has installed new roofs over the years, water has steadily seeped into the studio.

“The ceiling piece collapse was unfortunate, but that’s brought attention to a very worthy resource,” said Amy Freitag, the program director for American sites at the World Monuments Fund. To finance further repairs, the school has applied for state and federal grants.

If a few million dollars of restoration funding materializes, the school may even be able to reinstall Mr. Chanler’s windows, or perhaps transparent digital replicas. Five of the seven original windows are for sale for $1.2 million at Retro-Modern, an antiques store at 28 East 10th Street.

“I’m not in a position to donate them to the school,” said Bronnie Hindin, one of the owners of the store. “I have to perpetuate my business here. But I would love to see them end up back at the Whitney studio somehow, to see changing sunlight again through these insane, explosive, avant-garde designs.”

http://www.nytimes.com/2008/12/01/nyregion/01studio.html?ref=design

Arty Subversives Storm the Museum

By JORI FINKEL

Los Angeles

FOR one day this month the Los Angeles County Museum of Art had the distinct feel of summer camp. In the inner chamber of a Richard Serra sculpture visitors sat in a circle around two musicians, one drumming and the other strumming. Outdoors some took a workshop to learn how to crochet small fluffy birds. Others helped make what was billed as an army of foals — four-legged wooden structures that lurched under their own power into the crowds.

Mark Allen, the 38-year-old founder of Machine Project, an alternative arts space that staged this mix of performances, workshops and installations, had other metaphors for this meta-event.

He called it “A Machine Project’s Field Guide to the Los Angeles County Museum of Art,” as if the goal were to explore the natural habitat of the museum. And in conversation, Mr. Allen invoked parks. “Los Angeles has so few public spaces where people can gather, we wanted to treat the museum as a sort of park, creating these pockets of social activity,” he said.

“Visiting a museum can be like visiting a very rich person’s house, where you feel pressure to admire the furniture,” he added. “We wanted this to feel more like hanging out with friends.”

Generating analogies for the unlikely workings of Machine Project is one of Mr. Allen’s skills. Another is helping individual artists and rogue arts organizations, which are fast proliferating here, to realize odd projects under his group’s umbrella. Since 2003, when he opened an arts space for Machine Project in a small storefront in the Echo Park neighborhood, he has played host to a wide range of projects, like an attempt to rebuild Rome in a day by the artist Liz Glynn and a workshop on psychobotany (yes, plant telepathy) by the Center for Tactical Magic.

But these days, he said, “we are in some sort of transition from being an art venue to being a collective that works like a theater troupe. It’s like we have this home theater that produces plays there, but we are also developing this ability to take shows on the road.”

And his shows are getting bigger. Two years ago he took over the Santa Monica fair Art L.A. with events and nonevents, like a napping area. Last summer he produced four performances for Glow, an arts festival on the Santa Monica Pier, where musicians were perched in the baskets of a Ferris wheel to form an orchestra.

For the Field Guide he assembled 35 artists to explore and exploit the museum over several months, generating hundreds of ideas. They whittled that down to about 55 projects, like Holly Vesecky’s creating from flowers a copy of a Sam Francis painting; Lewis Keller’s making ambient music from the hum of the museum’s air-conditioning; and Jessica Hutchins and Dawn Kaspar’s staging a campuswide 26-clue murder mystery, beginning with a female corpse, tarred and feathered, found under a Calder mobile.

The variety and complexity of the Field Guide, which is feeding a book to be released by the museum in spring, makes for a strange moment in the short life of Machine Project. How does a low-rent, do-it-yourself organization (whose leading fund-raising model for a while was a pneumatic tube that makes a noisy display of sucking up dollar bills) work with a bigger, more bureaucratic institution without losing its grass-roots soul? And how does a small nonprofit preserve a sense of spontaneity and intimacy in a vast setting?

“The biggest challenge for me,” Mr. Allen said, “is to make sure everything stays on a human scale. Some people like things that are cool. I like warm, friendly, comfortable.”

For the Field Guide he tucked projects into odd corners of the older buildings to ignite a sense of discovery. “The dusty corners of the museum were our favorites,” he said. (The Broad Contemporary Art Museum on campus proved too “shiny and new” for this purpose, he said.)

Charlotte Cotton, the photography curator who invited Mr. Allen to invigorate the museum for a day, said she was drawn to his sense of adventure. “Mark didn’t want to just become the entertainment for the museum, throwing some sort of quirky, artsy party,” she said. “But this ain’t Hans Haacke either,” she added, using shorthand for the so-called institutional critiques of the 1990s, which posed philosophical questions about the museum setting.

Mr. Allen has been known for a blend of intellectual curiosity and collegiality since his time in Houston in the mid-1990s, when he turned his house into a gallery. One Fourth of July, for instance, he gave a big party so hundreds of people could witness an ambitious but ultimately unsuccessful attempt to launch an artist in a lawn chair into flight with helium balloons.

Since then Mr. Allen has developed more of a résumé-worthy career, earning his master’s degree at the California Institute of the Arts and starting Machine Project before joining the faculty of Pomona College. This year he also became a board member of the Andy Warhol Foundation in Pittsburgh, replacing the director of the Hammer Museum, Annie Philbin, as a Los Angeles representative.

But Mr. Allen said his mandate at the Warhol Foundation was “to represent scrappy, storefront, noninstitutional institutional spaces,” and he still operates intuitively. He rented the storefront for Machine Project before knowing what he wanted to do with it, and programming remains unpredictable. Just about anything goes, except for those six-week rotations of paintings that dominate the art market.

On the roster for December is an “on-call poetry-delivery service” offered by the poet Joshua Beckman, who vows to deliver poems door to door within a two-mile radius of Machine Project with “postmanlike

courage." The holiday season also brings food — a pie-baking lecture and practicum by Jen Bervin and the annual Fry-B-Q fund-raising event, where anyone can deep-fry meat or candy for a small fee.

"At Machine we use the gallery as a sort of shell," Mr. Allen said. "We use the form of an art gallery to do whatever we're interested in." He compared his approach to that of a magazine like The Believer or a Web site like Boingboing.net.

"Machine is like a blog come to life," he said. "It's like I just looked at a Web page on carnivorous plants and then looked up Rick Springfield's first album and want to talk about it. I think the gallery space ends up fulfilling the same function, but physically."

Technology is a central theme for Mr. Allen, who has worked odd jobs as a computer programmer and game designer. But he is not thrilled by robotics-based art. And he often finds himself drawn to analog technology, better known as craft.

"Craft and technology are interchangeable for us," he said. He pointed out that even the age-old technology of pickling might seem foreign to shoppers accustomed to buying their sour dills at the store. "How do you program a computer, and how do you make a bar of soap? Don't both seem equally mystifying to you?"

One workshop at Machine that he singled out was the Institute for Figuring's "Crocheting the Hyperbolic Plane," where hyperbolic refers to an unruly form of non-Euclidean geometry. The form is made naturally by sea sponges and coral, but mathematicians struggled for years to model it until Daina Taimina seized on crocheting as a solution about a decade ago.

Mr. Allen loved the mix of participants: young artists, mathematicians and "these older women who would drive three hours to learn a new type of crocheting," he said. "That opened my eyes to the idea that you could use workshops to bring different audiences together."

For the Field Guide, Mr. Allen invited the Institute for Figuring to set up a related workshop as part of a mission to crochet a massive coral reef out of plastic bags. He also reached out to other collectives. Fallen Fruit, a group of urban foragers, mapped the location of fruit in the museum's collection, while the Public School at Telic held weekly courses inside the Serra sculpture on subjects like shipbuilding, complete with knot-tying lessons and "Moby-Dick" readings.

"Mark runs Machine Project, but it's really a network of people like us," said Margaret Wertheim, co-founder of the Institute for Figuring.

"I don't know of any city other than L.A. with so many feral groups," she added, using her pet name for those fringe, hybrid organizations known for collaboration and participation, art market be damned. Mr. Allen and Ms. Wertheim both named the Museum of Jurassic Technology as an inspiration for such collectives, which have flourished here for the last five years.

"It's also about breaking down the wall between artist and audience," Ms. Wertheim said. "We don't want to pontificate from on high. We believe that everyone can make art."

Machine Project shares this democratic ideal, which in programming corners would be called open-source and in art circles sounds a lot like Dada. "What I do best," Mr. Allen said, "is to take every idea seriously, no matter what someone says. I do not prefilter them by judging: Is it too expensive? Is it too dangerous?"

Even when barriers arise or projects lose steam, he does not lose interest. This means that when curators at the Los Angeles County Museum of Art did not like the idea of his planting a speed metal guitarist

beneath a carved Gothic doorway (“some curators, let’s be frank, thought it was stupid”), he opted to make a model of the arch and move the show outside.

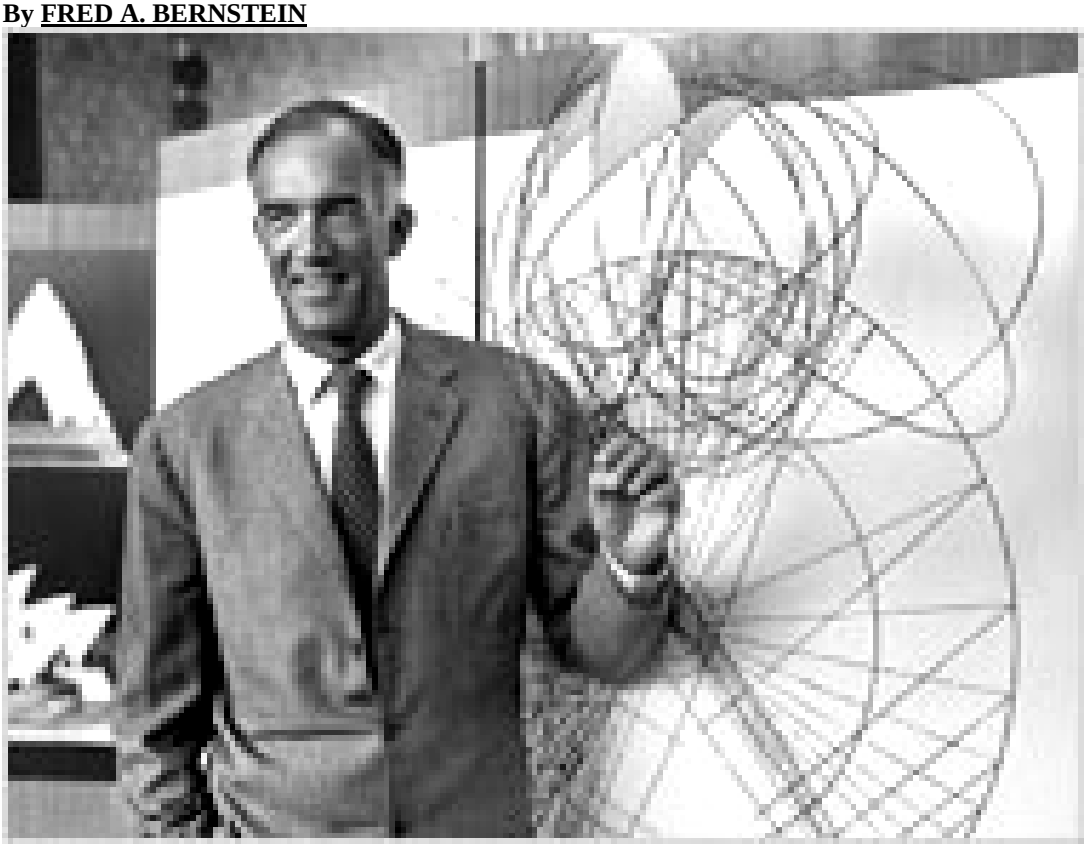
And this means that one of his favorite projects for the Field Guide took place after the fact. It’s a sestina composed by Machine’s assistant director, Jason Brown, that lists all the projects that didn’t get made. The poem, now for sale as a limited-edition print at the museum store, begins: “Garden on top of the elevator. Student driver parking valets.”

Mr. Allen also shared a few rejected — but not forgotten — titles for the Field Guide project. “I remember two big contenders: ‘Failure Is Always an Option’ and ‘Someone Said We Could Do This.’ ”

http://www.nytimes.com/2008/11/30/arts/design/30fink.html?ref=design

Jorn Utzon, 90, Dies; Created Sydney Opera House

By FRED A. BERNSTEIN



Jorn Utzon, an architect who designed one of the world's most recognizable buildings — the Sydney Opera House — but never saw it finished, died in Copenhagen on Saturday. He was 90.

He died of heart failure in his sleep, according to his son Kim.

Mr. Utzon left Australia amid controversy seven years before the Opera House was completed. He lived out most of his final decades on the Spanish island of Majorca while his gull-roofed building came to symbolize Australia, 10,000 miles away.

As a young architect Mr. Utzon worked for Gunnar Asplund in Sweden and Alvar Aalto in Finland before establishing his own practice in Copenhagen in 1950. In 1956 he read about the Sydney Opera House competition in a Swedish architecture magazine. He spent six months designing a building with sail-like roofs, their geometry, he said, derived from the sections of an orange. Mr. Utzon's plan was championed by Eero Saarinen, the Finnish architect who was one of the judges in the competition.

In 1957, Mr. Utzon — who until then was hardly known outside his native country — was declared the winner, and for the next five years he worked on the project from his office in Denmark. In 1962, he moved with his wife, Lis, sons Jan and Kim, and daughter, Lin, to Sydney.

When only the shell of the opera house was complete, the architect found himself at odds with Davis Hughes, the New South Wales minister for public works, over cost overruns and delays. When Mr. Hughes stopped payments to Mr. Utzon in 1966, the architect packed up his family and left the country.

Supporters of Mr. Utzon said that an unreasonably low construction estimate made it seem as though costs had escalated far more than they had, and that Mr. Utzon had been treated unfairly.

Writing in Harvard Design Magazine in 2005, Bent Flyvbjerg, a professor of planning at Aalborg University in Denmark, argued that "the real loss in the Sydney Opera House project is not the huge cost overrun in itself. It is that the overrun and the controversy it created kept Utzon from building more masterpieces."

In recent years, Australian organizations tried to heal the breach. In 2002, Mr. Utzon was commissioned to design interior renovations that would bring the building closer to his original vision; his son Jan, who is also an architect, traveled to Australia to carry out the work. And in 2003, Mr. Utzon received an honorary doctorate from the University of Sydney. (Jan took his place at the ceremony.)

The same year, Mr. Utzon won the Pritzker Prize, considered architecture's highest honor. Frank Gehry, who was a Pritzker juror at the time, said that Mr. Utzon "made a building well ahead of its time, far ahead of available technology, and he persevered through extraordinary malicious publicity and negative criticism to build a building that changed the image of an entire country."

Jorn Utzon, the son of a naval architect, was born in Aalborg, Denmark, on April 9, 1918. He studied architecture at the Royal Academy in Copenhagen. After leaving Australia, he worked in Hawaii, Switzerland and Spain before settling in Majorca in the mid-1970s. In addition to the Sydney Opera House, he designed the National Assembly of Kuwait, a church at Bagsvaerd, Denmark, and many private homes, including two in Majorca for himself and his wife. He chose the spot for the first house, he said, because it reminded him of the Australian beachfront he had hurriedly departed.

Though he suffered from failing eyesight in his final years, he continued to discuss architecture and could visualize plans the way a chess player can visualize a board, Jan Utzon said.

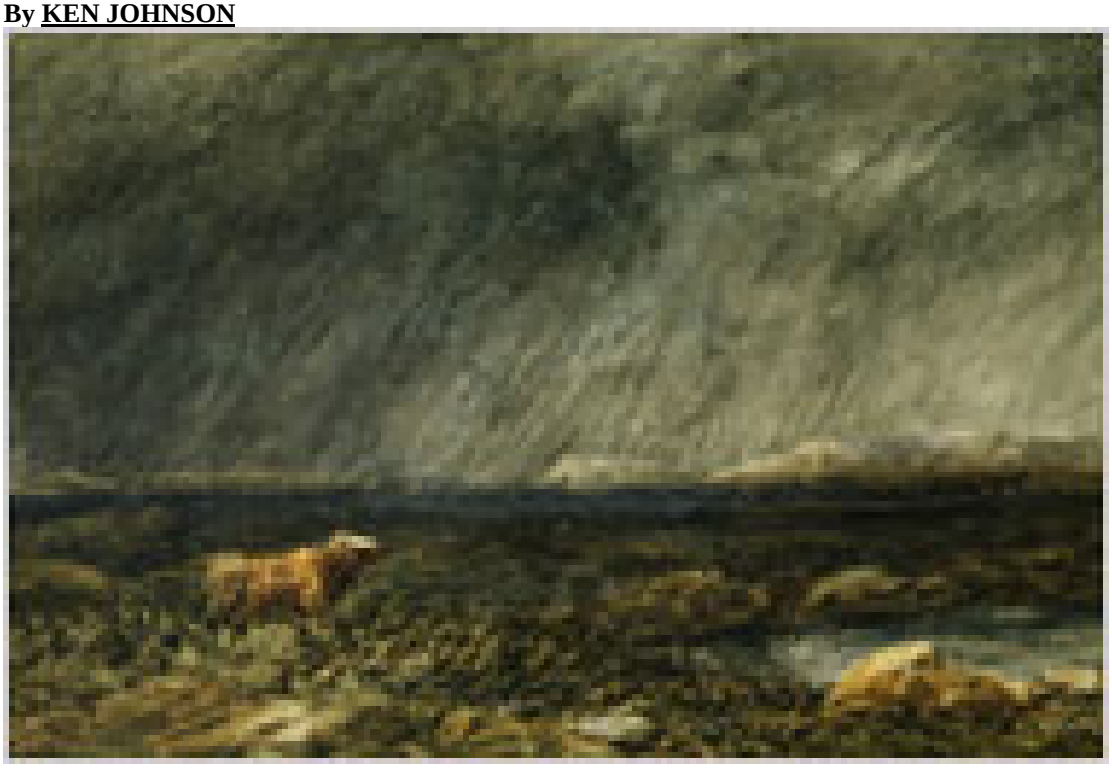
He is survived by his wife, three children — Jan, of Hellebaek, Denmark; Kim, of Copenhagen; and Lin, of Majorca — five grandchildren and four great-grandchildren.

When he was accepting the honorary doctorate in 2003, Jan Utzon said the fact that his father had never visited the opera house did not mean he had not experienced the building. "As its creator, he just has to close his eyes to see it," he said.

http://www.nytimes.com/2008/11/30/arts/design/30utzon.html?ref=design

Weathered but Not Broken: Painter's Take on Man vs. Nature in Watercolor

By KEN JOHNSON



NEW HAVEN — Watercolor was all the rage in early-19th-century England, and one of its liveliest practitioners is the subject of an expansive, engaging show, "Sun, Wind and Rain: The Art of David Cox," at the Yale Center for British Art here.

As the exhibition's title suggests, Cox's specialty was weather. He had a knack for picturing windy days. But unlike J. M. W. Turner, the period's most famous watercolorist and weather painter, Cox was not drawn to the terrifying sublime in which immense storms dwarf the human to helpless insignificance. Nor did he use occasions of extreme meteorology as opportunities to push representation to the brink of abstraction.

In Cox's paintings the scale is generally human, and while the world may be rough at times, it is rarely murderous. In "Sun, Wind and Rain" (1845) we view from the rear a man and a woman on a white horse riding along a dirt road between wide, grassy fields. They are bundled in heavy clothes, and she is holding up a pale green parasol. Blustery wind whips three slender, leafy trees; blue sky shows through breaks in the clouds; birds fly this way and that in the distance; light rain falls in angled streaks. Despite the precipitation the travelers and the trees are lighted by the sun. It is a wonderfully tumultuous scene, but far from calamitously so.

The vibrancy of the day is reflected in Cox's vigorous way of painting. He was an expert but not an overly refined technician. His watercolors are loose and richly textured. Scenes that appear seamlessly realistic from a distance are brushy and grainy up close.

He made all the usual types of landscapes. As organized by Scott Wilcox, the center's chief curator, the exhibition includes Poussin-esque pastorals, portraits of great British houses and castles, and awesome Welsh mountain views. "Windermere During the Regatta" (1832), which depicts a group of fancily dressed people on a bucolic, lakeside stone plaza, nods to Watteau's wistful Rococo masterpiece "The

Embarkation for Cythera." (The show, produced in association with the Birmingham Museums and Art Gallery in England, where it will appear next year, includes more than 100 watercolors from 1805 to 1858, as well as drawings and 14 oil paintings.)

The pictures that feel closest to Cox's heart are those in which people and animals press on against the world's challenges. "Ulverston Sands" (1835) finds a group of travelers, horses and wagons pausing before a great, sandy expanse under a turbulent gray sky. A note in the catalog explains that they have stopped before continuing on a dangerous passage from Ulverston to Lancaster. The way across the sands was "a treacherous route beset by fog, quicksand and rapidly incoming tides. Lives were regularly lost, and travelers relied on guides to conduct them safely across."

In Cox's most compelling works the world is daunting, but people endure. They persist and are not defeated. Often they are headed into the picture, moving toward some unseen goal. For the empathetic viewer this creates a sense of vicarious participation in the virtual world evoked by the painting. It also hints at a spiritual dimension: people progress by going farther and deeper into the world and its experiences. Life is a journey.

Perhaps that sense of humble persistence reflects Cox's rather uneventful, steadily industrious life. Born in Birmingham in 1783, he apprenticed as a locket and miniature painter and worked for some years as a theatrical scene painter. In 1804 he went to London hoping to continue his scene painting career but soon fell into executing watercolors, by which he was able to support himself, sometimes with supplemental income as a drawing master, for the rest of his life. He was married and he had a son, David Jr., who carried on the family watercolor-making business, though not at so high a level as his father, judging from a few of his works included in the Yale show.

Cox suffered a stroke in 1853, but he continued to work for another six years, producing some of his most affecting and stylistically daring pictures. "On the Moors, Near Bettws-y-Coed" (around 1856) shows a bull in a rainstorm standing in a dark, flat, desolate landscape. Raising its head, the animal bellows at the sky as though in mournful defiance of the elements. Cox's expressionistic painterly freedom makes the image blurrily dreamy. It's a Rembrandt-like portrait of the artist as an old man determined to carry on come what may.

In the exhibition's most poignant work, "Darley Churchyard" (around 1858), a lone workman digs a grave in a church cemetery. A great yew tree stands behind him and a pale moon rises in the misty evening sky. This soulful visual poem was one of Cox's last pieces. He declared it "the best I have ever done."

"Sun, Wind and Rain: The Art of David Cox" runs through Jan. 4 at the Yale Center for British Art, 1080 Chapel Street, New Haven; (877) 274-8278, ycba.yale.edu.

http://www.nytimes.com/2008/11/27/arts/design/27cox.html?ref=design

Eternal Objects of Desire

By ROBERTA SMITH

The very title “Art and Love in Renaissance Italy” is a win-win. It promises romance, desire, youthful beauty, ritual, expensive gift items and possible sex in the land of Romeo and Juliet. It delivers on all counts.

But the exhibition, at the Metropolitan Museum, is not an unbroken string of masterpieces. It has its ups and downs, both visual and emotional. It mixes happy endings and cautionary tales and, toward its finish, throws in some Renaissance pornography. The more than 160 works range across ceramic and glass vessels, jewelry, textiles and books as well as prints, drawings, paintings and sculptures. Most were created as public celebrations of engagements, weddings and childbirth; others served more private purposes.

Some of the objects seem pedestrian. Some of the paintings verge on folk art. But if a perfect harmony of impeccable artistry and that less quantifiable thing called love is not always achieved — well, welcome to reality. The foibles often make the works on view all the more telling and accessible.

It helps of course that the central theme is the most cherished of all human emotions and that, for better and for worse, the rituals under examination have been models of Euro-American nuptials ever since. The proceedings here seem riddled with the anxieties of proud parents and nervous new couples, fraught with various forms of repression, layered with punctiliously observed social decorum and coated with a penchant for ostentatious display.

And imperfections don’t necessarily rule out masterpiece status; they may add enduring mystery. One of the highlights of the exhibition is the Met’s great painting of a bridal couple, made by Fra Filippo Lippi in the early 1440s. The young man and woman assume the standard pose — stark profile — that recurs on vases, plates, rings and pendants as well as paintings throughout the show. The bride, shown in left profile and lavishly robed, bejeweled and coiffed, occupies her small interior like a big, expensive doll in its box.

The profile of the young man intrudes, just barely, from a window on the left. It is as if he is not supposed to be in the picture but couldn't help himself, and can't believe his great luck.

And yet something is off. The catalog notes that their eyes don't meet, but more than that, the figures barely face each other. While he looks in from the window, she seems to look out an implied doorway next to it. Their misalignment contributes to her objectification: she is not really seen. It also keeps the viewer on tenterhooks. You hope for the best but suspect mismatched expectations.

"Art and Love" is a collaboration between the Met and the Kimbell Art Museum in Fort Worth, and in particular between Andrea Bayer, a curator in the Met's department of European painting and sculpture, and Nancy Edwards, the Kimbell's curator of European art. Their goal is to embed the visual arts in the social and thus psychological fabric of secular life in the Renaissance, at least as lived by the wealthy few, and by the artists and artisans who met their material needs on important occasions.

In the status-conscious, highly regulated and self-aware hothouse of Renaissance Italy, few occasions mattered more than weddings. Glories both past and future hung in the balance of these transactions with their carefully negotiated dowries, exchange of symbolic objects, merging of powerful families and promise of dynastic perpetuation.

To achieve their goal the curators have orchestrated a rich collaboration of connoisseurship, art history and history. Both exhibition and catalog brim with facts gleaned from contemporary records: private journals and letters; inventories of dowries; descriptions of days on end of feasts, festivities and public processions; details of who wore what and how much it cost. We learn that it was the groom's responsibility to provide his wife-to-be with sumptuous garments and jewels, especially those she would wear in the procession from her family home to his. We also learn that he might use her dowry to pay for these garments (which he might also eventually sell), or for the cost of renting them.

The exhibition repeatedly demonstrates that every object, art or otherwise, is a kind of text about the context that produced it. This is true whether it has only nominal visual interest, like an early-16th-century wafer iron personalized with the names of the bride and groom (which you cannot see), used for making large thin wafers at their wedding feast and then passed down through generations; or Titian's "Venus With an Organist and a Dog," on loan from the Prado. Hanging in the exhibition's final gallery, it exposes a voluptuous nude to one of the most besotted male gazes in all art.

The works here reveal the ease with which Christian and neo-classical motifs mingled in secular arts during the Renaissance; the centrality of painting as both record and decoration; and the extent to which weddings were big business for artists who found themselves between religious commissions.

Not surprisingly, the bulk of the exhibition is devoted to the wedding process and its aftermath: consummation and childbirth. One highlight is the second gallery, packed with large maiolica vases that marked engagements, especially in Rome, and large plates made especially for wedding feasts. Their motifs bristle with family crests (usually hybrids of his and hers) and profile portraits, but also warnings about heartbreak, which seems to be largely a female crime. We see a woman shooting arrows at her tied-up lover, à la St. Sebastian; another slices the clothing of hers, as if beginning to flay him alive.

In one gallery a series of betrothal and marriage portraits, beginning with the Lippi, trace about a century of relaxing postures. The dress-parade profiles soften into three-quarter and finally frontal poses. The couple in Lorenzo Lotto's "Portrait of a Married Couple" (1523-24), casually draped across one of the artist's signature Persian carpets, might almost be a contemporary wedding photograph.

Childbirth, a perilous venture in these centuries, was also a cause for celebration and artistic commissions, with the most costly being childbirth trays about two feet in diameter and painted on both sides. This exhibition includes nearly a dozen, probably more than you'll ever see again. One, "The

Meeting of Solomon and the Queen of Sheba," from the workshop of Francesco del Cossa, has almost knotted spatial complexities that make it a bravura demonstration of that Renaissance invention, one-point perspective. Two others, executed by an artist known only as the Master of 1416, have the steep, naïve rock formations of Siennese painting, rendered here in red.

Even more alluring are the relatively modest maiolica childbirth bowls and plates, which depict deliciously sweet interiors of the mothers-to-be in confinement, surrounded by other women, either just before or just after giving birth.

The exhibition's second half is dominated by paintings and prints. A somewhat daunting gallery presents the long, narrow painted panels that grooms commissioned for the wainscoting or casketlike chests of their bridal chambers. The busy compositions are noteworthy for their enchanting landscape backgrounds and occasional violence. A panel by Botticelli's workshop depicts a wedding feast interrupted by a nude young woman being attacked by dogs. She and the man at her side represent a couple from Boccaccio's "Decameron." In short, she rejected him and he committed suicide, two unforgivable sins. It's the show's most pointed cautionary image; the bride and groom in both the painting and the room it decorates will know better.

By now the air is thick with a sense of social propriety, which is relieved by a section devoted to increasingly erotic erotica, complete with posted warning sign. (It has been organized by Linda Wolk-Simon, a curator in the Met's department of prints and drawings.) A print of a Venetian courtesan is interactive: her skirt can be lifted to reveal her undergarments. A ridiculous Arcimboldo-like image of a man's head, made entirely of phalluses, adorns a plate.

But the standout is a monumental print by a 17th-century French artist called Monogrammist CLF that is Salvador Dalí before the fact. It centers on a busy parade in which a large cannonlike phallus is being pulled toward a distinctly female tree. One can imagine it speaking for the feelings of many Renaissance brides, who tended not to be much older than 15, on their wedding nights.

These works underscore the erotic impulses implicit in the paintings of idealized women, clothed and naked, found in the show's final gallery. Here you'll see the show's two best-known masterpieces, both by Titian: the "Venus" from the Prado, where the organist's dream of love is reiterated by the upright pipes of his instrument and the steep symmetrical plunge of the tree-lined park behind the couple; and, beside it, the more circumspect "Venus Blindfolding Cupid," from the Villa Borghese in Rome. Also here is Lotto's subtly kinky "Venus and Cupid" from the Met.

These three paintings alone merit a visit to the show. But it's hard to appreciate them fully after all this revelatory exhibition has shown being visited upon women and their bodies. They may strike you, in a purely emotional sense, as overkill.

"Art and Love in Renaissance Italy" continues through Feb. 16 at the Metropolitan Museum of Art; (212) 535-7710, metmuseum.org.

This article has been revised to reflect the following correction:

Correction: November 22, 2008
An art review on Friday about "Art and Love in Renaissance Italy," at the Metropolitan Museum of Art, and an accompanying picture caption, misstated the given name of the painter of "Portrait of a Man and Woman at a Casement" in some editions. He was Fra Filippo Lippi, not Fra Lippo Lippi.

http://www.nytimes.com/2008/11/21/arts/design/21love.html

Century Later, Gold Coin Reflects Sculptor's Vision

By MATTHEW HEALEY

WEST POINT, N.Y. — With the push of a button and some 60 tons of pressure, a blank gold disc was converted into an ultra-high-relief coin at the branch of the United States Mint here Monday, and a century-old vision for America's coinage was finally fully realized.

Producing the $20 coins, initially conceived by the American sculptor Augustus Saint-Gaudens in 1907, has been a personal goal of the mint's director, Edmund C. Moy, since he was appointed in 2006. "Saint-Gaudens was a bit of a poet and wanted to tell a story," Mr. Moy said at a ceremony Monday at the branch, where the new coin was first struck. "Liberty has visited America and is now marching into the rest of the world, led by enlightenment. America's best days are ahead."

In President Theodore Roosevelt's opinion, those ideals weren't embodied by existing coins, and he commissioned his friend Saint-Gaudens to come up with fresh designs.

His vision for the coin, known as a double eagle (it was twice the value of the $10 coin known as the eagle), was hailed by Roosevelt and others as a classical masterpiece. A full figure representing Liberty strides toward the viewer, torch raised, hair flowing and robes billowing, one foot on a promontory while the sun rises over the Capitol dome behind her. The reverse shows an eagle in flight over a blazing sun. The coin's mastery lay chiefly in two trademarks of the sculptor's style, typical of his medals: the comparatively high relief and the graceful incorporation of lettering in the design.

But one crucial person was not enamored: Charles Barber, chief engraver of the United States Mint at the time and a designer himself of several coins then in circulation — those Roosevelt and much of the public so disliked. According to Alison Frankel's 2006 book, "Double Eagle," Barber fought for his turf and did little to smooth the way for Saint-Gaudens's designs.

Barber's main critique was that the coin's exceptionally high relief made production impossibly slow and difficult, and he had a point. In early tests up to 11 strikes per coin were required to bring out all the details. A variation using a smaller but thicker blank had to be abandoned because such a change would need Congressional approval.

Barber then remade the coin in a considerably flatter version that would work for high-volume production. The following year, 1908, Congress insisted that the motto "In God We Trust" be added. Roosevelt, a religious man, considered it inappropriate to put the name of God on money, and had told Saint-Gaudens (who died in August 1907 before production began) to omit it. The motto was inserted, somewhat incongruously, on the coin's reverse, between the sun and its rays. This version circulated until 1933, when President Franklin D. Roosevelt, as part of his response to the Depression, banned hoarding of gold.

Today, the 1907 ultra-high relief $20 trial pieces are highly prized by collectors, not only for their beauty but also for their rarity. Fewer than two dozen survive, and they command six- and seven-figure prices. A circulated flat-relief version, containing a little less than an ounce of gold, typically sells for $800 to $1,200.

The double eagle is still generally considered the most beautiful American coin ever made. "We haven't been as thoughtful with all our coin designs in the modern era," Mr. Moy said after the ceremony, adding that he hoped to introduce modern coins that were beautiful, high-tech and uniquely American.

In the 1980s the mint began producing gold bullion coins that revived the flat-relief design on one side, in one-ounce sizes and smaller, for investors.

The newest coins, slightly more than an inch in diameter, use the smaller, thicker blanks rejected in 1907, are dated MMIX (2009), and contain exactly an ounce of 24-karat gold. The original coins were larger in size and contained 22-karat gold, hard enough to withstand circulation, but Mr. Moy, said modern investors prefer pure gold, which also has the benefit of being soft enough to turn into ultra-high relief coins.

The first $20 coin will be placed in the National Museum of American History of the Smithsonian Institution. The rest, which will be produced for only a year, go on sale to collectors and investors in January, at a price still to be determined, based largely on the current bullion price of gold. (On Monday afternoon it was about $824 an ounce in New York.)

Though the new coin is largely faithful to Saint-Gaudens's vision, in one respect it won't resemble the original: the reverse still reads "In God We Trust."

http://www.nytimes.com/2008/11/25/arts/design/25coin.html?ref=design

Antioxidants 'cannot slow ageing'

Diets and creams claiming their antioxidant properties could cheat ageing may be worthless, a study says.

Using Nematode worms, scientists found even those given enhanced antioxidant powers to deal with tissue damaging "free radicals" did not live longer.

The team from University College London said, in the Genes and Development journal, there was "no clear evidence" they could slow ageing.

Antioxidants are a staple of the beauty and health industries.

This has been based on a 50-year-old theory.

In 1956, it was suggested that ageing was caused by a build-up of molecular damage caused by reactive forms of oxygen, called superoxides or free radicals, circulating in the body. This is known as oxidative stress.

Antioxidants supposedly worked to mop up these free radicals, minimising their damage.

This week's study, however, could explain why many studies aimed at proving the theory have been inconclusive.

Nematode worms

The tiny Nematode worm, despite appearing to be far-removed from the human species, is a useful tool for scientists who want to explore how our bodies work.

They share many genes with humans, and, crucially, have a lifespan measured in days, which allows scientists to get clues about long-term changes.

The UCL team, led by Dr David Gems, genetically manipulated nematodes so that their bodies were able to "mop up" surplus free radicals.

This in theory, should give them an advantage over normal nematodes in terms of ageing and lifespan.

However, these worms lived just as long as the others, suggesting that "oxidative stress" is less of a factor in the ageing of our cells and tissues as some have suggested.

Dr Gems said: "The fact is that we don't understand much about the fundamental mechanisms of ageing - the free radical theory has filled a knowledge vacuum for over 50 years now, but it doesn't stand up to the evidence.

"It is clear that if superoxide is involved, it plays only a small part in the story - oxidative damage is clearly not a universal, major driver of the ageing process."

He said a healthy, balanced diet was important for reducing the risk of many "old age" diseases, such as cancer, diabetes and osteoporosis, but there was no clear evidence that eating antioxidants could slow or prevent ageing, and even less evidence to support the claims made by antioxidant pills and creams.

'**No magic bullet**'

The research was supported by the Wellcome Trust, and Dr Alan Schafer, its head of molecular and physiological sciences, said: "Research such as this points to how much we have to learn about ageing, and the importance of understanding the mechanisms behind this process."

A spokesman for the British Dietetic Association said that it had been hard to find the evidence to support antioxidants from previous studies.

She said: "All the evidence has come from epidemiological studies looking at the whole diet - where there was some sign of benefit to people who ate diets with antioxidants, but also who ate lots of other good things.

"What this shows is that there is likely to be no one 'magic bullet' in terms of diet and health -the important thing is still achieving a healthy balance."

A spokesman for the Cosmetic Toiletry and Perfumery Association said cosmetic companies carry out extensive research and rigorous scientific studies to ensure claims are supported by robust evidence.

"Findings on the genetics of a particular nematode worm may not be directly relevant to the complex process of ageing as it happens in higher animals such as the human," the association added.

Pamela Mason, of the Health Supplements Information Service, said: "Antioxidant vitamins, like any other vitamins were never intended for the prevention of chronic disease and mortality. They are not magic bullets.

"They are intended for health maintenance on the basis of their various physiological roles in the body and in the case of the antioxidant vitamins, this does, in appropriate amounts, include a protective antioxidant effect in the body's tissues."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7754644.stm

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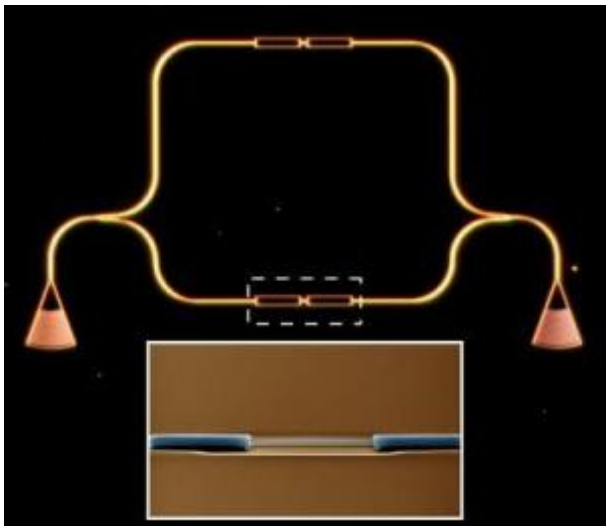
'The Photon Force Is With Us': Harnessing Light To Drive Nanomachines



Photonic circuit in which optical force is harnessed to drive nanomechanics. (Credit: Tang/Yale)

ScienceDaily (Nov. 28, 2008) — Science fiction writers have long envisioned sailing a spacecraft by the optical force of the sun's light. But, the forces of sunlight are too weak to fill even the oversized sails that have been tried. Now a team led by researchers at the Yale School of Engineering & Applied Science has shown that the force of light indeed can be harnessed to drive machines — when the process is scaled to nano-proportions.

Their work opens the door to a new class of semiconductor devices that are operated by the force of light. They envision a future where this process powers quantum information processing and sensing devices, as well as telecommunications that run at ultra-high speed and consume little power.

The research, appearing in the November 27 issue of Nature, demonstrates a marriage of two emerging fields of research — nanophotonics and nanomechanics. – which makes possible the extreme miniaturization of optics and mechanics on a silicon chip.

The energy of light has been harnessed and used in many ways. The "force" of light is different — it is a push or a pull action that causes something to move.

"While the force of light is far too weak for us to feel in everyday life, we have found that it can be harnessed and used at the nanoscale," said team leader Hong Tang, assistant professor at Yale. "Our work demonstrates the advantage of using nano-objects as "targets" for the force of light — using devices that are a billion-billion times smaller than a space sail, and that match the size of today's typical transistors."

Until now light has only been used to maneuver single tiny objects with a focused laser beam — a technique called "optical tweezers." Postdoctoral scientist and lead author, Mo Li noted, "Instead of moving particles with light, now we integrate everything on a chip and move a semiconductor device."

"When researchers talk about optical forces, they are generally referring to the radiation pressure light applies in the direction of the flow of light," said Tang. "The new force we have investigated actually kicks out to the side of that light flow."

While this new optical force was predicted by several theories, the proof required state-of-the-art nanophotonics to confine light with ultra-high intensity within nanoscale photonic wires. The researchers

showed that when the concentrated light was guided through a nanoscale mechanical device, significant light force could be generated — enough, in fact, to operate nanoscale machinery on a silicon chip.

The light force was routed in much the same way electronic wires are laid out on today's large scale integrated circuits. Because light intensity is much higher when it is guided at the nanoscale, they were able to exploit the force. "We calculate that the illumination we harness is a million times stronger than direct sunlight," adds Wolfram Pernice, a Humboldt postdoctoral fellow with Tang.

"We create hundreds of devices on a single chip, and all of them work," says Tang, who attributes this success to a great optical I/O device design provided by their collaborators at the University of Washington.

It took more than 60 years to progress from the first transistors to the speed and power of today's computers. Creating devices that run solely on light rather than electronics will now begin a similar process of development, according to the authors.

"While this development has brought us a new device concept and a giant step forward in speed, the next developments will be in improving the mechanical aspects of the system. But," says Tang, "the photon force is with us."

Tang's team at Yale also included graduate student Chi Xiong. Collaborators at University of Washington were Thomas Baehr-Jones and Michael Hochberg. Funding in support of the project came from the National Science Foundation, the Air Force Office of Scientific Research and the Alexander von Humboldt post-doctoral fellowship program.

Citation: Nature (November 27, 2008)

Adapted from materials provided by Yale University.

http://www.sciencedaily.com/releases/2008/11/081126133305.htm

Drink Brewed Tea To Avoid Tooth Erosion, Study Suggests

When deciding between the many options available, the best thing to drink to avoid tooth erosion is brewed tea. (Credit: iStockphoto/Manuela Weschke)

ScienceDaily (Nov. 28, 2008) — Today, the average size soft drink is 20 ounces and contains 17 teaspoons of sugar. More startling is that some citric acids found in fruit drinks are more erosive than hydrochloric or sulfuric acid—which is also known as battery acid. These refined sugars and acids found in soda and citrus juice promote tooth erosion, which wears away the hard part of the teeth, or the enamel. Once tooth enamel is lost, it's gone forever.

There is a beverage that does not produce such irreversible results. When deciding between the many options available, the best thing to drink to avoid tooth erosion is brewed tea, according to a study in the July/August issue of General Dentistry, the clinical, peer-reviewed journal of the Academy of General Dentistry (AGD).

Apart from tasting good, brewed tea has many health benefits. Tea is loaded with natural antioxidants, which are thought to decrease incidence of cancer, cardiovascular disease, and diabetes.

Mohamed A. Bassiouny, DMD, BDS, MSc, PhD, the lead author of the study, compared green and black tea to soda and orange juice in terms of their short- and long-term erosive effect on human teeth. The study found that the erosive effect of tea was similar to that of water, which has no erosive effect. And, when comparing green versus black, he discovered that there is a better option among those as well.

Dr. Bassiouny says that "when we look at tea and read about the benefits, it's amazing—not because green tea is 'the in thing'—but because there are advantages." He adds that much research done overseas, in countries such as Japan and Europe, found that green tea was identified to being superior over black due to its natural flavonoids (plant nutrients) and antioxidants.

But, if you do drink tea, experts suggest avoiding additives such as milk, lemon, or sugar because they combine with tea's natural flavonoids and decrease the benefits. In addition, stay away from prepackaged iced teas because they contain citric acid and high amounts of sugars. It does not matter whether the tea is warm or cold—as long as it is home brewed without additives.

Kenton Ross, DMD, FAGD, AGD spokesperson, sees patients' erosion problems on a daily basis in his practice. "Severe cases of erosion occur monthly and are frequently associated with high rates of soft drink consumption," he says. "This study clearly shows that brewed teas resulted in dramatically less enamel loss than soft drinks and acidic juices," says Dr. Ross. "I would highly recommend patients choose tea as an alternative to more erosive drinks like soda and fruit juice."

Tips to decrease erosion:

- Reduce or eliminate carbonated beverages. Instead, drink water, milk, or tea
- Skip the additives such as sugar, lemon, and milk
- Drink acidic drinks quickly and through a straw
- Chew sugar-free gum to increase saliva flow in your mouth
- Rinse with water to neutralize the acids, and wait an hour before brushing

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Adapted from materials provided by Academy of General Dentistry, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081125132514.htm

Expressing Emotions In E-mail So As Not To Be Misinterpreted

ScienceDaily (Nov. 28, 2008) — In a new article in the current issue of American Journal of Sociology authors Daniel A. Menchik and Xiaoli Tian (both of the University of Chicago) study how we use emoticons, subject lines, and signatures to define how we want to be interpreted in email. The authors find that "a shift to email interaction requires a new set of interactional skills to be developed."

Unlike face-to-face conversations, email interactions leave out tone of voice, body-language and context, which can lead to misunderstandings. While these authors agree that there are difficulties, they believe that no way of communicating is actually superior to another.

Menchik and Tian argue that face-to-face and internet-based contexts each require a set of distinct interaction strategies. "People can cultivate ways of communicating in online contexts that are equally as effective as those used offline," they write. "The degree to which … individuals develop unique conventions in the medium will determine their ability to communicate effectively."

The research focuses on "the case of a well-known scientific organization that decided to replace occasional meetings of a research panel with ongoing email interaction." The panel encountered numerous problems conversing via email. But the researchers identified several ways people were able to overcome these barriers.

"People innovate in response to the challenges of a new context for the communication of essential elements of language," the authors write.

Capital letters, use of quotations, emoticons, exclamation points, punctuation, bullet points, style and even color help the sender communicate the meaning of a word or message. For example, "I feel betrayed" reads differently from "I FEEL SO BETRAYED!! ;)" where the capital letters and winking smiley face indicate sarcasm.

Participants also maintained their conversational flow by cutting and pasting from previous emails and using subject lines that referenced previous discussions. In email listservs these devices help address comments to a certain individual and help the discussion to stay on topic.

Signatures, disclaimers and other information about the person's state of mind were also commonly used when writing an email. The authors found that subjects felt more comfortable communicating once they knew a little about each other, like the information included in a signature. They also found that indicating the frame of mind as a disclaimer, (i.e. "I wrote this at 5AM" or "on a blackberry while on vacation") helped prevent the email from being misinterpreted.

Developers have picked up on these cues with the advent of linguistic monitors such as Eudora's MoodWatch feature. This program tries to indicate to the sender that their email might be considered inflammatory, and to the receiver that they are about to receive such an email.

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

http://www.sciencedaily.com/releases/2008/11/081125161537.htm

Fast Molecular Rearrangements Hold Key To Plastic's Toughness

Plastics are a type of material known to chemists and engineers as polymer glasses. Unlike a crystal, in which molecules are locked together in a perfectly ordered array, a glass is molecularly jumbled, with its constituent chemical building blocks trapped in whatever helter-skelter arrangement they fell into as the material cooled and solidified. While this atomic disorder means that glasses are less stable than crystals, it also provides molecules in the glass with some wiggle room to move around without breaking apart. (Credit: iStockphoto/Gabor Izso)

ScienceDaily (Nov. 28, 2008) — Plastics are everywhere in our modern world, largely due to properties that render the materials tough and durable, but lightweight and easily workable. One of their most useful qualities, however - the ability to bend rather than break when put under stress - is also one of the most puzzling.

This property, described as "plastic flow", allows many plastics to change shape to absorb energy rather than breaking apart, says University of Wisconsin-Madison chemistry professor Mark Ediger. For example, one type of bulletproof glass stops a bullet by flowing around it without breaking. Regular window glass, unable to flow in this way, would simply shatter.

"This is an odd combination of properties... These materials shouldn't be able to flow because they're rigid solids, but some of them can," he says. "How does that happen?"

Ediger's research team, led by graduate student Hau-Nan Lee, has now described a fundamental mechanism underlying this stiff-but-malleable quality. In a study appearing Nov. 28 in Science Express, they report that subjecting a common plastic to physical stress - which causes the plastic to flow - also dramatically increases the motion of the material's constituent molecules, with molecular rearrangements occurring up to 1,000 times faster than without the stress.

These fast rearrangements are likely critical for allowing the material to adapt to different conditions without immediately cracking.

Plastics are a type of material known to chemists and engineers as polymer glasses. Unlike a crystal, in which molecules are locked together in a perfectly ordered array, a glass is molecularly jumbled, with its constituent chemical building blocks trapped in whatever helter-skelter arrangement they fell into as the material cooled and solidified.

While this atomic disorder means that glasses are less stable than crystals, it also provides molecules in the glass with some wiggle room to move around without breaking apart.

"Polymer glasses are used in many, many different applications," including polycarbonate, which is found in popular reusable water bottles, Ediger says. Aircraft windows are also often made of polycarbonate. "One of the reasons polymer glasses are used is that they don't break when you drop them or fly into a bird at 600 miles per hour."

However, their properties can change dramatically under different physical conditions such as pressure, temperature, and humidity. For example, many polymer glasses become brittle at low temperatures, as anyone knows who has ever dropped a plastic container from the freezer or tried to work on vinyl house siding in cold weather.

As plastics become more and more prevalent in everything from electronics to airplanes, scientists and engineers face questions about the fundamental properties and long-term stability of these materials over a range of conditions.

For example, next-generation commercial aircraft are trending toward including less metal in favor of higher proportions of lightweight polymer materials - roughly 50 percent in the new Boeing 787 compared to only 10 percent in the Boeing 777 - and engineers need to know how these materials will respond to different stresses: a hard landing, strong winds, or changes in temperature or humidity.

"How is it going to respond 20 years from now when it gets twisted, or stretched, or compressed? Is it going to respond by absorbing that energy and staying intact, or is it going to respond by breaking bonds and flying apart into pieces?" asks Ediger.

The Wisconsin team examined the mechanics of a common plastic called polymethylmethacrylate – also known as Plexiglas or acrylic - and found that a pulling force had a pronounced effect on the molecules within the material, speeding up their individual movements by more than a factor of 1,000. The team observed internal molecular rearrangements within 50 seconds that would have taken a full day without the force applied. They believe this increased motion allows the material to flow without breaking.

"When you pull on it, you increase the mobility in the material," Ediger says. "The act of pulling on it actually transforms the glass into a liquid that can then flow. Then when you stop pulling on it, it transforms back to a glass."

The work has benefited from collaboration between chemists and engineers in a Nanoscale Interdisciplinary Research Team (NIRT) supported by the National Science Foundation (NSF), which includes UW-Madison chemical and biological engineering professor Juan de Pablo and groups at the University of Illinois and Purdue University.

"From the most fundamental perspective, we're trying to understand why pulling on a glass allows it to flow," Ediger says. "The answer to that question will help us to better model the behavior of real materials in real applications."

In addition to Ediger and Lee, the paper is authored by Keewook Paeng and Stephen Swallen. The work was funded by NSF.

Adapted from materials provided by University of Wisconsin-Madison.

http://www.sciencedaily.com/releases/2008/11/081127145128.htm

Explanation For 'Face Blindness' Offered

ScienceDaily (Nov. 28, 2008) — For the first time, scientists have been able to map the disruption in neural circuitry of people suffering from congenital prosopagnosia, sometimes known as face blindness, and have been able to offer a biological explanation for this intriguing disorder.

Currently thought to affect roughly two percent of the population, congenital prosopagnosia manifests as the lifelong failure to recognize faces in the absence of obvious neurological damage, and in individuals with intact vision and intelligence.

Studying subjects aged 33 to 72 using diffusion tensor imaging and tractography, the team of scientists from Carnegie Mellon University, Kings College in London and Ben-Gurion University in Israel were able to show that, unlike that of normal brains, there was a reduction in the integrity of the white matter tracts in the brains of individuals with congenital prosopagnosic. Moreover, the extent of the reduced white matter circuitry was related to the severity of the behavioral impairment.

White matter is one of the three main solid components of the central nervous system. The white matter is the tissue through which messages pass between different areas of grey matter within the nervous system. People with congenital prosopagnosia are not able to recognize faces, while the ability to recognize other objects may be relatively intact.

This discovery of reduced white matter circuitry could also lead to further understanding of other neurodevelopment disorders, such as developmental dyslexia, in which the same underlying neural alterations might be present. The findings are also important as congenital prosopagnosia is, in many cases, inherited and so studies of this sort can help us understand the relationship between genetics and cortical development.

So far, few successful therapies have been developed for affected people, although individuals often learn to use feature-by-feature recognition strategies or secondary clues such as hair color, body shape and voice. Because the face seems to function as an important identifying feature in memory, it can also be difficult for people with this condition to keep track of information about people, and socialize normally with others.

"This disorder is also of great interest in helping us understand how and under what conditions the brain is or is not 'plastic' as these individuals appear not to be able to compensate for their inability to recognize faces even though they have had ample opportunity to do so over the course of development," said Marlene Behrmann, a professor of psychology at Carnegie Mellon.

Behrmann said the team was excited by the possibility that the failure to propagate signals between different regions of the brain might provide a biological explanation for this perplexing disorder.

The results are reported in the Nov. 23 online issue of Nature Neuroscience.

Adapted from materials provided by Carnegie Mellon University.

http://www.sciencedaily.com/releases/2008/11/081125141604.htm

Arrogant, Abusive and Disruptive -- and a Doctor

By LAURIE TARKAN

It was the middle of the night, and Laura Silverthorn, a nurse at a hospital in Washington, knew her patient was in danger.

The boy had a shunt in his brain to drain fluid, but he was vomiting and had an extreme headache, two signs that the shunt was blocked and fluid was building up. When she paged the on-call resident, who was asleep in the hospital, he told her not to worry.

After a second page, Ms. Silverthorn said, “he became arrogant and said, ‘You don’t know what to look for — you’re not a doctor.’ ”

He ignored her third page, and after another harrowing hour she called the attending physician at home. The child was rushed into surgery.

“He could have died or had serious brain injury,” Ms. Silverthorn said, “but I was treated like a pest for calling in the middle of the night.”

Her experience is borne out by surveys of hospital staff members, who blame badly behaved doctors for low morale, stress and high turnover. (Ms. Silverthorn said she had been brought to tears so many times that she was trying to start her own business and leave nursing.)

Recent studies suggest that such behavior contributes to medical mistakes, preventable complications and even death.

“It is the health care equivalent of road rage,” said Dr. Peter B. Angood, chief patient safety officer at the Joint Commission, the nation’s leading independent hospital accreditation agency.

A survey of health care workers at 102 nonprofit hospitals from 2004 to 2007 found that 67 percent of respondents said they thought there was a link between disruptive behavior and medical mistakes, and 18 percent said they knew of a mistake that occurred because of an obnoxious doctor. (The author was Dr. Alan Rosenstein, medical director for the West Coast region of VHA Inc., an alliance of nonprofit hospitals.)

Another survey by the Institute for Safe Medication Practices, a nonprofit organization, found that 40 percent of hospital staff members reported having been so intimidated by a doctor that they did not share their concerns about orders for medication that appeared to be incorrect. As a result, 7 percent said they contributed to a medication error.

There are signs, however, that such abusive behavior is less likely to be tolerated. Physicians and nurses say they have seen less of it in the past 5 or 10 years, though it is still a major problem, and the Joint Commission is requiring hospitals to have a written code of conduct and a process for enforcing it.

Still, every nurse has a story about obnoxious doctors. A few say they have ducked scalpels thrown across the operating room by angry surgeons. More frequently, though, they are belittled, insulted or yelled at — often in front of patients and other staff members — and made to feel like the bottom of the food chain. A third of the nurses in Dr. Rosenstein's study were aware of a nurse who had left a hospital because of a disruptive physician.

"The job is tough enough without having to prepare yourself psychologically for a call that you know could very well become abusive," said Diana J. Mason, editor in chief of The American Journal of Nursing.

Laura Sweet, deputy chief of enforcement at the Medical Board of California, described the case of a resident at a University of California hospital who noticed a problem with a fetal monitoring strip on a woman in labor, but didn't call anyone.

"He was afraid to contact the attending physician, who was notorious for yelling and ridiculing the residents," Ms. Sweet said. The baby died.

Of course, most doctors do not spew insults or intimidate nurses. "Most people are trying to do the best job they can under a high-pressure situation," said Dr. Joseph M. Heyman, chairman of the trustees of the American Medical Association.

Dr. William A. Norcross, director of a program at the University of California, San Diego, that offers anger management for physicians, agreed. But he added, "About 3 to 4 percent of doctors are disruptive, but that's a big number, and they really gum up the works." Experts say the leading offenders are specialists in high-pressure fields like neurosurgery, orthopedics and cardiology.

In one instance witnessed by Dr. Angood of the Joint Commission, a nurse called a surgeon to come and verify his next surgical patient and to mark the spot where the operation would be done. The harried surgeon yelled at the nurse to get the patient ready herself. When he showed up late to the operating room, he did not realize the surgery site was mismarked and operated on the wrong part.

"The surgeon then berated the entire team for their error and continued to denigrate them to others, when the error was the surgeon's because he failed to cooperate in the process," Dr. Angood said.

A hostile environment erodes cooperation and a sense of commitment to high-quality care, Dr. Angood said, and that increases the risk of medical errors.

"When the wrong surgery is done on patients," he said, "often there is somebody in that operating room who knew the event was going to occur who did not feel empowered enough to speak up about it."

Dr. Norcross blamed "the brutal training surgeons get, the long hours, being belittled and 'pimped' " — a term for being bombarded with questions to the point of looking stupid. "That whole structure teaches a disruptive behavior," he said.

Dr. Norcross and other experts said staff members' understandable reluctance to challenge a physician, especially a popular surgeon who attracts patients to the hospital, created an atmosphere of tolerance and indifference. So did a tendency among doctors to form "old boy" networks and protect one another from criticism.

But things have begun to change. Today, good communication and leadership are two of the six core skills taught in medical schools and residency programs. More nurses are challenging doctors on their inappropriate behavior, and fewer hospitals are tolerating disruptive doctors. "Today they're getting rid of that doctor or sending them to anger management," said Dr. Thomas R. Russell, executive director of the American College of Surgeons.

Hospitals have also developed more formal and consistent ways of addressing disruptive behavior, Dr. Rosenstein said. They are also trying to improve relations and mutual respect between doctors and nurses.

At John Muir Health, a nonprofit group of two hospitals in Walnut Creek and Concord, Calif., a committee of physicians, nurses and other staff members was formed to focus on collaboration and communication between disciplines.

"When complaints are submitted, we try to be proactive early to let them know there is not going to be any tolerance for that," said Dr. Roy Kaplan, John Muir's medical director for quality.

Some physicians worry that hospital administrators will abuse the stricter codes of conduct by using them to get rid of doctors who speak out against hospital policies. And the Joint Commission rulings have spawned a cottage industry of anger management centers and law firms defending hospitals or physicians.

Professionals like Ms. Silverthorn, the nurse in Washington, said the change was overdue.

"We go to school, we have a very important job, but there's no respect," she said.

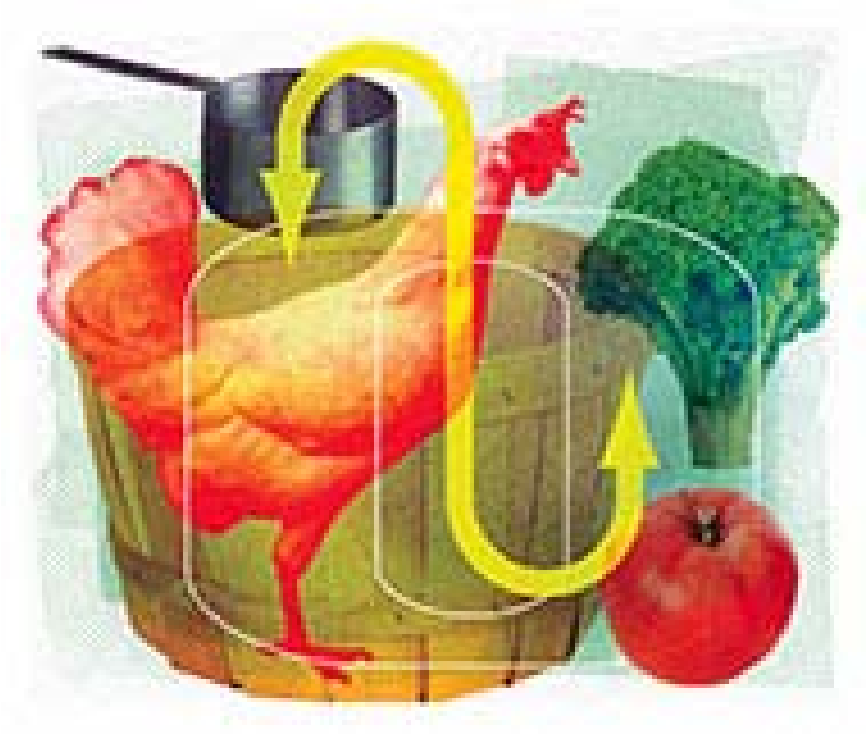
She recalled a particularly humiliating moment on Dec. 25, 2006. Working in the pediatric emergency room, she called a drug by its generic name rather than its brand name.

"I was quickly shouted out of the trauma room and humiliated in front of everyone," she said. But while "everyone knew the doctor was actually the one who didn't know what he was doing," she continued, no one said a word.

http://www.nytimes.com/2008/12/02/health/02rage.html?_r=1&nl=8hlth&emc=hltha1

For Three Years, Every Bite Organic

By TARA PARKER-POPE



Fruits, vegetables and animals can be 100 percent organic. What about people?

In a fascinating experiment — on himself — Dr. Alan Greene, a pediatrician and author in Danville, Calif., decided to find out. For the last three years, Dr. Greene has eaten nothing but organic foods, whether he's cooking at home, dining out or snacking on the road.

He chose three years as a goal because that was the amount of time it took to have a breeding animal certified organic by the Department of Agriculture. While food growers comply with organic regulations every day, Dr. Greene wondered whether a person could meet the same standards.

It hasn't been easy.

"This isn't a way of eating I could recommend to anybody else because it's so far off the beaten food grid," said Dr. Greene, 49, the founder of a popular Web site about children's health, drgreene.com. "It was much more challenging than I thought it would be, and I thought it would be tough. There were definitely days where there was nothing I could find that was organic."

Other writers have ventured off the traditional food grid, notably Barbara Kingsolver in "Animal, Vegetable, Miracle" and Michael Pollan in "The Omnivore's Dilemma." But what makes Dr. Greene's experiment remarkable is the length of time he devoted to it, and his effort to incorporate organic eating into the routines of everyday living. His findings offer new insight into the challenges facing the organic food industry and those of us who want to patronize it.

Organic farmers don't use conventional methods to fertilize the soil, control weeds and pests, or prevent disease in livestock.

Organic methods often lead to higher costs, and consumers can pay twice as much for organic foods as for conventional products. Last week, the financial advice Web site SmartMoney.com reported that to feed eight people an organic meal of traditional Thanksgiving foods, a shopper would pay $295.36 — a premium of $126.35, or 75 percent, over a nonorganic holiday spread.

To cut back on the cost of an organic diet, Dr. Greene said he had to cut back on meat. “Whenever you go up the food chain, the costs pile up,” he said. “If you don’t eat meat at every meal, if meat becomes more of a side dish than a centerpiece, you can fill the plate with healthy organic food for about the same price.”

Questions remain about whether organic foods are really better for you. The data are mixed. This fall, researchers from the University of Copenhagen reported on a two-year experiment in which they grew carrots, kale, peas, potatoes and apples using both organic and conventional growing methods. The researchers found that the growing methods made no difference in the nutrients in the crops or the levels of nutrients retained by rats that ate them, according to the study, published in The Journal of the Science of Food and Agriculture.

But other research suggests that organic foods do contain more of certain nutrients — almost twice as many, in the case of organic tomatoes studied for a 2007 report in The Journal of Agricultural and Food Chemistry.

Dr. Greene said he was inspired to go all-organic after talking to a dairy farmer who noted that livestock got sick less after a switch to organic practices. He wondered if becoming 100 percent organic might improve his own health.

Three years later, he says he has more energy and wakes up earlier. As a pediatrician regularly exposed to sick children, he was accustomed to several illnesses a year. Now, he says, he is rarely ill. His urine is a brighter yellow, a sign that he is ingesting more vitamins and nutrients.

At home, he said, the organic routine was relatively easy. Organic food is widely available, not just at stores like Whole Foods but at traditional supermarkets. He also shopped at farmer’s markets and joined a local community-supported agriculture group, or C.S.A. Because he bought less meat, the costs tended to balance out. And his family (two of his four children still live at home) largely went along with the experiment.

On the road, though, life was more challenging. In corporate cafeterias and convenience stores, he looked for stickers that began with the number 9 to signify organic; stickers on conventionally grown produce begin with 4. When dining out, he called ahead; high-end restaurants were willing to accommodate his all-organic request. He also found a few lines of organic backpacking food that he could carry with him.

Dr. Greene reached the three-year milestone in October, but his diet is still organic. He hasn’t decided whether to keep going full tilt or to ease up in the interest of cost and convenience. In his latest book, “Raising Baby Green: The Earth-Friendly Guide to Pregnancy, Childbirth and Baby Care” (Jossey-Bass), he advocates a “strategic” approach, urging parents to insist on organic versions of a few main foods, like milk, potatoes, apples and baby food.The biggest surprise of the whole experience, he says, was that many people still don’t know what “organic” means.

“It’s surprising to me how few people know that organic means without pesticides, antibiotics or hormones,” he said. “In stores or restaurants around the country, I would ask, ‘Do you have anything organic?’ Half the time they would say, ‘Do you mean vegetarian?’ ”

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A previous version of this article misstated the name of a book by Barbara Kingsolver. It is "Animal, Vegetable, Miracle," not "Animal, Vegetable, Mineral."

http://www.nytimes.com/2008/12/02/health/02well.html?nl=8hlth&emc=hltha1

Standing in Someone Else's Shoes, Almost for Real

By BENEDICT CAREY

From the outside, psychotherapy can look like an exercise in self-absorption. In fact, though, therapists often work to pull people out of themselves: to see their behavior from the perspective of a loved one, for example, or to observe their own thinking habits from a neutral distance.

Marriage counselors have couples role-play, each one taking the other spouse's part. Psychologists have rapists and other criminals describe their crime from the point of view of the victim. Like novelists or moviemakers, their purpose is to transport people, mentally, into the mind of another.

Now, neuroscientists have shown that they can make this experience physical, creating a "body swapping" illusion that could have a profound effect on a range of therapeutic techniques. At the annual meeting of the Society for Neuroscience last month, Swedish researchers presented evidence that the brain, when tricked by optical and sensory illusions, can quickly adopt any other human form, no matter how different, as its own.

"You can see the possibilities, putting a male in a female body, young in old, white in black and vice versa," said Dr. Henrik Ehrsson of the Karolinska Institute in Stockholm, who with his colleague Valeria Petkova described the work to other scientists at the meeting. Their full study is to appear online this week in the journal PLoS One. .

The technique is simple. A subject stands or sits opposite the scientist, as if engaged in an interview.. Both are wearing headsets, with special goggles, the scientist's containing small film cameras. The goggles are rigged so the subject sees what the scientist sees: to the right and left are the scientist's arms, and below is the scientist's body.

To add a physical element, the researchers have each person squeeze the other's hand, as if in a handshake. Now the subject can see and "feel" the new body. In a matter of seconds, the illusion is complete. In a series of studies, using mannequins and stroking both bodies' bellies simultaneously, the Karolinska researchers have found that men and women say they not only feel they have taken on the new body, but also unconsciously cringe when it is poked or threatened.

In previous work, neuroscientists have induced various kinds of out-of-body experiences using similar techniques. The brain is so easily tricked, they say, precisely because it has spent a lifetime in its own body. It builds models of the world instantaneously, based on lived experience and using split-second assumptions — namely, that the eyes are attached to the skull.

Therapists say the body-swapping effect is so odd that it could be risky for anyone in real mental distress. People suffering from the delusions of schizophrenia or the grandiose mania of bipolar disorder are not likely to benefit from more disorientation, no matter the intent.

But those who seek help for relationship problems, in particular, often begin to moderate their behavior only after they have worked to see the encounters in their daily life from others' point of view.

"This is especially true for adolescents, who are so self-involved, and also for people who come in with anger problems and are more interested in changing everyone else in their life than themselves," said Kristene Doyle, director of clinical services at the Albert Ellis Institute in New York.

One important goal of therapy in such cases, Dr. Doyle said, is to get people to generate alternative explanations for others' behavior — before they themselves react.

The evidence that inhabiting another's perspective can change behavior comes in part from virtual-reality experiments. In these studies, researchers create avatars that mimic a person's every movement. After watching their "reflection" in a virtual mirror, people mentally inhabit this avatar at some level, regardless of its sex, race or appearance. In several studies, for instance, researchers have shown that white people who spend time interacting virtually as black avatars become less anxious about racial differences.

Jeremy Bailenson, director of the Virtual Human Interaction Lab at Stanford University, and his colleague Nick Yee call this the Proteus effect, after the Greek god who can embody many different self-representations.

In one experiment, the Stanford team found that people inhabiting physically attractive avatars were far more socially intimate in virtual interactions than those who had less appealing ones. The effect was subconscious: the study participants were not aware that they were especially good-looking, or that in virtual conversations they moved three feet closer to virtual conversation partners and revealed more about themselves than others did. This confidence lingered even after the experiment was over, when the virtual lookers picked more attractive partners as matches for a date.

Similar studies have found that people agree to contribute more to retirement accounts when they are virtually "age-morphed" to look older; and that they will exercise more after inhabiting an avatar that works out and loses weight.

Adding a physical body-swapping element, as the Swedish team did, is likely to amplify such changes. "It has video quality, it looks and feels more realistic than what we can do in virtual environments, so is likely to be much more persuasive," Dr. Bailenson said in a telephone interview.

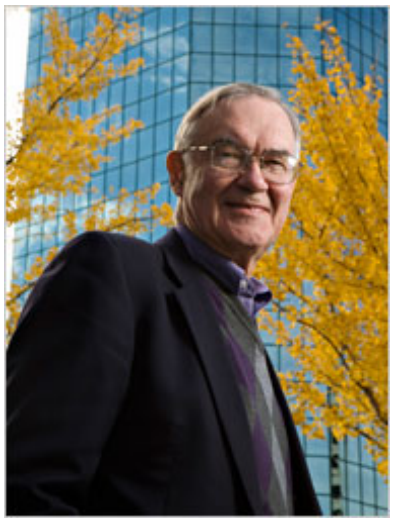
Perhaps too persuasive for some purposes. "It may be like the difference between a good book, where you can project yourself into a character by filling in with your imagination, and a movie, where the specific actor gets in the way of identifying strongly," he went on.

And above and beyond any therapeutic purposes, the sensation is downright strange. In the experiments, said Dr. Ehrsson, the Swedish researcher, "even the feeling from the squeezing hand is felt in the scientist's hand and not in your own; this is perhaps the strangest aspect of the experience."

http://www.nytimes.com/2008/12/02/health/02mind.html?nl=8hlth&emc=hltha1

The Minimal Impact of a Big Hypertension Study

By ANDREW POLLACK



The surprising news made headlines in December 2002. Generic pills for high blood pressure, which had been in use since the 1950s and cost only pennies a day, worked better than newer drugs that were up to 20 times as expensive.

The findings, from one of the biggest clinical trials ever organized by the federal government, promised to save the nation billions of dollars in treating the tens of millions of Americans with hypertension — even if the conclusions did seem to threaten pharmaceutical giants like Pfizer that were making big money on blockbuster hypertension drugs.

Six years later, though, the use of the inexpensive pills, called diuretics, is far smaller than some of the trial's organizers had hoped.

"It should have more than doubled," said Dr. Curt D. Furberg, a public health sciences professor at Wake Forest University who was the first chairman of the steering committee for the study, which was known by the acronym Allhat. "The impact was disappointing."

The percentage of hypertension patients receiving a diuretic rose to around 40 percent in the year after the Allhat results were announced, up from 30 to 35 percent beforehand, according to some studies. But use of diuretics has since stayed at that plateau. And over all, use of newer hypertension drugs has grown faster than the use of diuretics since 2002, according to Medco Health Solutions, a pharmacy benefits manager.

The Allhat experience is worth remembering now, as some policy experts and government officials call for more such studies to directly compare drugs or other treatments, as a way to stem runaway medical costs and improve care.

The aftereffects of the study show how hard it is to change medical practice, even after a government-sanctioned trial costing $130 million produced what appeared to be solid evidence.

A confluence of factors blunted Allhat's impact. One was the simple difficulty of persuading doctors to change their habits. Another was scientific disagreement, as many academic medical experts criticized the trial's design and the government's interpretation of the results.

Moreover, pharmaceutical companies responded by heavily marketing their own expensive hypertension drugs and, in some cases, paying speakers to publicly interpret the Allhat results in ways that made their products look better.

"The pharmaceutical industry ganged up and attacked, discredited the findings," Dr. Furberg said. He eventually resigned in frustration as chairman of the study's steering committee, the expert group that continues to oversee analysis of data from the trial. One member of that committee received more than $200,000 from Pfizer, largely in speaking fees, the year after the Allhat results were released.

There was another factor: medicine moves on. Even before Allhat was finished, and certainly since then, new drugs appeared. Others, meanwhile, became available as generics, reducing the cost advantage of the diuretics. And many doctors have shifted to using two or more drugs together, helped by pharmaceutical companies that offer combination pills containing two medicines.

So Allhat's main query — which drug to use first — became "an outdated question that doesn't have huge relevance to the majority of people's clinical practices," said Dr. John M. Flack, the chairman of medicine at Wayne State University, who was not involved in the study and has consulted for some drug makers.

Dr. Sean Tunis, a former chief medical officer for Medicare, remains an advocate for comparative-effectiveness studies. But, as Allhat showed, "they are hard to do, expensive to do and provoke a lot of political pushback," said Dr. Tunis, who now runs the nonprofit Center for Medical Technology Policy, which tries to arrange such trials.

"There's a lot of magical thinking," he said, "that it will all be science and won't be politics."

Expensive Pills

Promising better ways to treat high blood pressure, drug companies in the 1980s introduced a variety of medications, including ones known as calcium channel blockers and ACE inhibitors.

Although there was no real evidence the newer pills were better, diuretics fell to 27 percent of hypertension prescriptions in 1992, from 56 percent in 1982. Use of the more expensive pills added an estimated $3.1 billion to the nation's medical bill over that period.

So the National Heart, Lung and Blood Institute, part of the federal National Institutes of Health, decided to compare the various drugs' ability to prevent heart attacks, strokes and other cardiovascular problems. "This was a big-bucks issue," said Dr. Jeffrey Cutler, the Heart, Lung and Blood Institute's project director for the study.

Allhat — short for the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial — began enrolling patients with high blood pressure, age 55 and older, in 1994, with more than 42,000 people eventually participating. Patients were randomly assigned one of four drugs: a diuretic called chlorthalidone; an ACE inhibitor called lisinopril, which AstraZeneca sold as Zestril; a calcium channel blocker, amlodipine, sold by Pfizer as Norvasc; and an alpha blocker, doxazosin, which Pfizer sold as Cardura.

Cardura was added only after Pfizer, which had already agreed to contribute $20 million to the trial's costs, increased that to $40 million, Dr. Cutler said.

Early Trouble Signs

Pfizer's bet on Cardura proved a big mistake. As the Allhat data came in, patients taking Cardura were nearly twice as likely as those receiving the diuretic to require hospitalization for heart failure, a condition in which the heart cannot pump blood adequately. Concerned, the Heart, Lung and Blood Institute announced in March 2000 that it had stopped the Cardura part of the trial.

What happened next provided the first signs that the Allhat evidence might not be universally embraced.

Rather than warn doctors that Cardura might not be suited for hypertension, Pfizer circulated a memo to its sales representatives suggesting scripted responses they could use to reassure doctors that Cardura was safe, according to documents released from a patients' lawsuit against the company.

And in an e-mail message unearthed in those same court documents, a Pfizer sales executive boasted to colleagues that company employees had diverted some European doctors attending an American cardiology conference from hearing a presentation on the Allhat results and Cardura. "The good news," the message said, "is that they were quite brilliant in sending their key physicians to sightsee rather than hear Curt Furberg slam Pfizer once again!"

Pfizer declined to comment on the messages.

The Food and Drug Administration waited a year before convening a meeting of outside experts to discuss Cardura's safety. At that session, some of the experts sharply challenged the conclusions of the Allhat organizers. They argued that the heart failure cases might have been false readings and that an inadequate dose of Cardura had been used in the trial.

By the end of the daylong meeting, Dr. Robert J. Temple, a senior F.D.A. official, was clearly exasperated by the experts' varying interpretations of a supposedly definitive trial.

"This is the largest and best attempt to compare outcomes we are ever going to see," he said. "And people are extremely doubtful about whether it has shown anything at all."

The committee decided that there was no need to issue an urgent warning to doctors and patients about Cardura.

Cardura sales held up in 2000. But the next year, worldwide sales fell to $552 million, from $795 million. Prescriptions for all alpha blockers fell 22 percent from 1999 to 2002 after having risen before then, according to one study.

Pfizer's decision to stop promoting Cardura in late 2000, after the drug lost patent protection, was a factor in the decline. But Allhat clearly was, too.

Cost-Benefit Analysis

The main Allhat results were announced in December 2002 at a news conference in Washington and published in The Journal of the American Medical Association.

In the primary target outcome of the trial — the prevention of heart attacks — the three remaining drugs were proved equal. But patients receiving the Norvasc calcium channel blocker from Pfizer had a 38 percent greater incidence of heart failure than those on the diuretic. And those receiving the ACE inhibitor from AstraZeneca had a 15 percent higher risk of strokes and a 19 percent higher risk of heart failure.

Moreover, the diuretic cost only about $25 a year, compared with $250 for an ACE inhibitor and $500 for a calcium channel blocker. So the diuretic was declared the winner.

But some hypertension experts accused the government of overstating the case for the diuretics, as a way to cut medical spending.

“There was a feeling there was a political and economic agenda as much as a scientific agenda,” said Dr. Michael Weber, a professor of medicine at the Health Science Center at Brooklyn, part of the State University of New York, who had been an investigator in the study but afterward became one of its leading critics. “They pushed beyond what the data allowed them to say.”

Critics said the rules of the trial had favored the diuretics. If the first drug did not adequately lower blood pressure — as happened in more than 60 percent of cases — a second drug could be added. But that second drug was usually a type that worked better with diuretics than with ACE inhibitors.

There were also more new cases of diabetes among the patients who took diuretics, although experts argued over how meaningful that finding was.

Adding fuel to the debate, an Australian study released two months after Allhat found an ACE inhibitor superior to a diuretic. The proper lesson to draw from Allhat, some critics contended, was that what matters most is how much blood pressure is lowered, not which drug is used to do it. For these and other reasons, European hypertension experts discounted Allhat.

Allhat’s proponents discounted the Australian study as less authoritative, and they dismissed the other criticisms.

Still, the arguments “muddied the waters,” said Dr. Randall S. Stafford of Stanford, who studied the effect of Allhat on prescriptions. “The message,” he said, “was no longer as clear to physicians.”

Science Moves On

By the time the Allhat results were released, lisinopril, the ACE inhibitor, had become generic. That meant AstraZeneca and Merck, which sold a version of the compound as Prinivil, had less interest in defending their drugs.

Not so Pfizer. Norvasc was the best-selling hypertension treatment in the world, with sales of $3.8 billion in 2002, and Pfizer’s second-biggest drug behind the cholesterol medication Lipitor.

The company set out to accentuate the positive. In a news release after the Allhat results were announced, it said that Norvasc was found to be “comparable to the diuretic in fatal coronary heart disease, heart attacks and stroke.” And in a medical journal advertisement, it proclaimed “ALL HATs off” to its drug.

Neither the news release nor the ad, however, included the 38 percent greater risk of heart failure with Norvasc in the Allhat study.

Nor did Hank McKinnell, then Pfizer’s chief executive, mention heart failure in lauding the results during his quarterly earnings conference call with analysts a few weeks after the Allhat report was released. “Contrary to what you might have read in the press,” Mr. McKinnell said, “Allhat is extremely positive for Norvasc. It will be our job to explain that to the medical community.”

Dr. Paul K. Whelton, president of Loyola University Health System and the current chairman of the Allhat steering committee, said that Pfizer and other drug companies "took what was in their best interest and ran with those, and conveniently didn't mention other things."

Pfizer defends its actions. Dr. Michael Berelowitz, the head of Pfizer's global medical organization, said that in the trial's design, heart failure was merely one component of a broader measure of various cardiovascular problems. And in that broader measure, Dr. Berelowitz said, there was no difference between Norvasc and the diuretic. Also, he said, the label for Norvasc already contained a precaution about heart failure.

"Further action regarding the heart failure finding was therefore not considered necessary," he said in a statement in response to questions.

Pfizer was not the only company promoting its drugs. The drug giant Novartis, for example, was spending heavily to market Diovan, a leader among a class of hypertension drugs called angiotensin receptor blockers, which were too new to have been included in Allhat. Diovan, which had more than $5 billion in sales last year, sells for $1.88 to $3.20 a pill on drugstore.com, compared with 8 to 31 cents for a diuretic.

No company, though, was spending money to promote generic diuretics. So the federal Heart, Lung and Blood Institute recruited Allhat investigators, provided them with training and sent them to proselytize fellow physicians. In all, 147 investigators gave nearly 1,700 talks and reached more than 18,000 doctors and other health care providers.

But it was a coffee-and-doughnuts operation compared with the sumptuous dinners that pharmaceutical companies used to market to doctors. Moreover, the steering committee's outreach program did not get under way until about three years after the results were published.

Dr. Stafford of Stanford said the outreach seemed to have had a slight effect on increasing the use of diuretics.

The results of Pfizer's efforts are easier to quantify. Norvasc sales continued to grow to $4.9 billion in 2006, falling only after the drug lost patent protection in the United States in 2007.

Tangles and Strife

Tensions about industry influence reached even the study's own steering committee. Dr. Furberg, the chairman, bluntly accused some members of the committee of being agents of the industry.

One member, Dr. Richard H. Grimm Jr. of the University of Minnesota, had been receiving tens of thousands of dollars a year from Pfizer since at least 1997, according to reports that pharmaceutical companies file in that state.

In 2003, the year after the Allhat results were published, Dr. Grimm's payments from Pfizer soared to more than $200,000 — an increase that The New York Times reported in 2007.

Dr. Grimm said in a recent interview that about half those fees in 2003 came from giving about 100 Pfizer-sponsored talks to doctors about Allhat. Dr. Grimm said he gave mainly the standard Allhat-sanctioned talk. But instead of saying diuretics were outright better than the other drugs, he said they were as good or better.

Meanwhile, Dr. Grimm had led an effort to remove Dr. Furberg from his position on the grounds that he had not been impartial.

"He had a vendetta against the calcium channel blockers," Dr. Grimm said. Dr. Furberg had been publicly questioning the safety of those drugs based on some studies he did in the 1990s. The effort to oust Dr. Furberg failed in 2001. But in August 2004, Dr. Furberg resigned as chairman, contending that there had not been enough effort to disseminate the Allhat message.

Dr. Whelton, who took over as chairman, said that the study's message was never compromised by industry ties on the steering committee.

"Curt is a wonderful guy who is a crusader," said Dr. Whelton, who did not have industry ties and was not involved in the effort to unseat Dr. Furberg. "He has certainly rubbed a lot of people, even good friends, the wrong way."

Changing Practice

Experts see several lessons to be learned from Allhat.

One is that "all trials have flaws" that leave the results open to interpretation, said Dr. Robert M. Califf, a cardiologist at Duke who served on the safety monitoring committee of Allhat.

Another is that providing doctors information is "necessary, but not sufficient" to urge them to change their practices, said Dr. Carolyn M. Clancy, director of the federal Agency for Healthcare Research and Quality, which itself conducts studies comparing different medical treatments.

And while insurers can influence practice through reimbursement policies, they did not seem to have pushed strongly for diuretics after Allhat, in part because some of the other drugs had become generic.

Even the cost-conscious medical system at the Department of Veterans Affairs did not require diuretics, because too many doctors would probably have requested exceptions, said Dr. William C. Cushman, chief of preventive medicine at the department's medical center in Memphis.

Dr. Cushman, a member of the Allhat steering committee, said diuretic use in the system was still "much lower" than he thought it should be.

Dr. Clancy said that her agency was now mainly using insurance records to judge how treatments perform. While clinical trials are the gold standard, she said, they are costly and time-consuming.

And, she added, "You might be answering a question that by the time you are done, no longer feels quite as relevant."

http://www.nytimes.com/2008/11/28/business/28govtest.html?nl=8hlth&emc=hltha2

Bone Finding May Point to Hope for Osteoporosis

By GINA KOLATA

Bone formation appears to be controlled by serotonin, a chemical previously known mainly for its entirely separate role in the brain, researchers are reporting.

The discovery could have enormous implications, osteoporosis experts say, because there is an urgent need for osteoporosis treatments that actually build bone.

Osteoporosis affects 10 million Americans over age 50. It results in bone loss, and its hallmark is fragile bones that break easily. With one exception, current treatments only slow further bone loss rather than increase bone formation. And the exception, parathyroid hormone, given by injection, is recommended only for short-term use and costs about $6,700 a year.

But in a paper published online Wednesday in the journal Cell, a team led by Dr. Gerard Karsenty, chairman of the department of genetics and development at the Columbia University College of Physicians and Surgeons, reports the discovery of an unexpected system that appears to control bone formation.

At its heart is serotonin made by the gut rather than the brain, whose role outside the brain had been a mystery. Ninety-five percent of the body's serotonin is made by the gut, but gut serotonin cannot enter the brain because it is barred by a membrane, the so-called blood-brain barrier.

Dr. Karsenty reports, though, that gut serotonin can directly control bone formation. It is released into the blood, and the more serotonin that reaches bone, the more bone is lost. Conversely, the less serotonin, the denser and stronger bones become. Dr. Karsenty was even able to prevent menopause-induced osteoporosis in mice by slowing serotonin production.

Osteoporosis researchers were dumbfounded by the report.

"I am very excited by this paper," said Dr. J. Christopher Gallagher, an osteoporosis specialist and professor of medicine at Creighton University. "It is a groundbreaking paper. One is completely surprised."

Dr. Ronald N. Margolis, senior adviser for molecular endocrinology at the National Institute of Diabetes and Digestive and Kidney Diseases, said: "I was astonished. My jaw was dropping."

Dr. Clifford J. Rosen, a senior scientist at the Maine Medical Center Research Institute, was no less impressed. "This is amazing science," Dr. Rosen said. "Amazing. The science is spectacular."

Dr. Ethel S. Siris, who directs the Toni Stabile Osteoporosis Center at Columbia, cautioned that the work was not with humans but instead involved mice that were engineered to have human genes. "This stuff is really exciting basic — underscore basic — research," Dr. Siris said.

The story of the serotonin-bone connection began with reports of a rare inherited condition causing fragile bones and blindness. Children with the condition had bones so weak that they needed wheelchairs or devices to assist them in walking.

The problem turned out to be a mutation that inactivated a gene called LRP5.

A few years later, another mutation was found in LRP5 that produced the opposite effect: extremely dense bones and resistance to osteoporosis. In this case, LRP5 was overactive. People with this gene mutation, Dr. Karsenty said, had jawbones so dense that it was difficult to extract their teeth.

Osteoporosis researchers jumped on those findings, realizing that LRP5 could hold clues to the disease. But most assumed that LRP5's role was in bone itself.With Dr. Karsenty's work, said Dr. Bjorn R. Olsen, a bone growth researcher at Harvard Medical School, "that has now been proven completely wrong."

Instead, Dr. Karsenty discovered that LRP5 acts on serotonin-producing cells in the gut. It blocks an enzyme that converts the amino acid tryptophan to serotonin. The more LRP5, the more the enzyme is blocked, and the less serotonin is made. The gene has no effect, apparently, on brain cells that make serotonin.

After the gut releases serotonin into blood, serotonin travels to bone-forming cells and inhibits their growth. "We made mice with the inactivated gene," Dr. Karsenty said, in which "the bone-forming cells are on strike." The cells simply would not grow, and the mice developed severe osteoporosis.

But the bone cells themselves were fine. When Dr. Karsenty grew them in the lab, where they were not exposed to serotonin, they developed normally.That told him that the problem was not in the bone cells but in some molecule in the mice's circulation. And that, Dr. Karsenty says, led him to serotonin. The mice had four to five times more serotonin in their blood than mice without the mutation.

He tested the idea by adding serotonin to normal mouse bone cells in the laboratory. The cells stopped growing.

He could even control bone formation in the mice with the mutated gene by giving them a diet deficient in tryptophan, the precursor of serotonin. Without much tryptophan, the mice could not make much serotonin. And their bones grew denser. (But animals with a normal version of the gene did not grow denser bones when they ate a tryptophan-deficient diet.)

Dr. Karsenty and his colleagues also did the reverse experiment, making mice with the mutation that causes superdense bones in humans. Those animals, he said, had "amazing bones" that were hard to break, and they did not develop osteoporosis.

When Dr. Karsenty looked at patients with the dense-bones mutation, they had low levels of serotonin in their blood.

Osteoporosis patients, though, tend to have normal serotonin levels, Dr. Karsenty said. Their disease involves not impaired bone formation but accelerated bone loss.

Bone is constantly being formed and absorbed, but when the balance shifts toward loss more than formation, the result can be osteoporosis. Dr. Karsenty's hope is to find a drug that depresses the gut's serotonin synthesis and stimulates bone growth in these patients.

Dr. T. John Martin, an emeritus professor of medicine at the University of Melbourne in Australia, cautions that all this will take years. He is enthusiastic, though.

"This will really change thinking in the field," Dr. Martin said. "It will have a big impact. I'm certain of that."

http://www.nytimes.com/2008/11/27/health/research/27bone.html?nl=8hlth&emc=hltha2

Health Halo Can Hide the Calories

By JOHN TIERNEY

If you're a well-informed, health-conscious New Yorker who has put on some unwanted pounds in the past year, it might not be entirely your fault. Here's a possible alibi: The health halo made you do it.

I offer this alibi after an experiment on New Yorkers that I conducted with Pierre Chandon, a Frenchman who has been studying what researchers call the American obesity paradox. Why, as Americans have paid more and more attention to eating healthily, have we kept getting fatter and fatter?

Dr. Chandon's answer, derived from laboratory experiments as well as field work at Subway and McDonald's restaurants, is that Americans have been seduced into overeating by the so-called health halo associated with certain foods and restaurants. His research made me wonder if New Yorkers were particularly vulnerable to this problem, and I asked him to help me investigate.

Our collaboration began in a nutritionally correct neighborhood, Brooklyn's Park Slope, whose celebrated food co-op has a mission statement to sell "organic, minimally processed and healthful foods." I hit the streets with two questionnaires designed by Dr. Chandon, a professor of marketing at the Insead business school in Fontainebleau, France, and Alexander Chernev, a professor of marketing at Northwestern University. Half of the 40 people surveyed were shown pictures of a meal consisting of an Applebee's Oriental Chicken Salad and a 20-ounce cup of regular Pepsi. (You can see it for yourself at TierneyLab.) On average, they estimated that the meal contained 1,011 calories, which was a little high. The meal actually contained 934 calories — 714 from the salad and 220 from the drink.

The other half of the Park Slopers were shown the same salad and drink plus two Fortt's crackers prominently labeled "Trans Fat Free." The crackers added 100 calories to the meal, bringing it to 1,034 calories, but their presence skewed people's estimates in the opposite direction. The average estimate for the whole meal was only 835 calories — 199 calories less than the actual calorie count, and 176 calories less than the average estimate by the other group for the same meal without crackers.

Just as Dr. Chandon had predicted, the trans-fat-free label on the crackers seemed to imbue them with a health halo that magically subtracted calories from the rest of the meal. And we got an idea of the source of this halo after I tried the same experiment with tourists in Times Square.

These tourists, many of them foreigners (they kept apologizing for not knowing what Applebee's was), correctly estimated that the meal with crackers had more calories than the meal without crackers. They didn't see the crackers' health halo, Dr. Chandon said, presumably because they hadn't been exposed to the public debate that accompanied New York City's decision last year to ban trans fat from restaurants.

"It makes sense that New Yorkers would be more biased because of all the fuss in the city about trans fat," Dr. Chandon told me. "It hasn't been a big issue in most other places. Here in Europe there's been virtually no discussion of banning trans fats."

So might New York's pioneering ban on trans fats have done more harm than good? Did it encourage people to eat more calories (and other fats that some scientists argue are no less harmful)? Did people start eating French fries — hey, they're trans-fat free now! — and reward themselves with dessert? I can't pretend to know the answers after our little experiment, which hardly constitutes peer-reviewed research. But the results were statistically significant and certainly jibe with other findings by Dr. Chandon and his frequent collaborator, Brian Wansink, the director of the Cornell Food and Brand Lab.

They've found that all of us, even professional dieticians, make systematic mistakes when estimating how many calories are on a plate. Experiments showed that putting a "low fat" label on food caused everyone, especially overweight people, to underestimate its calories, to eat bigger helpings and to indulge in other foods.

The researchers found that customers at McDonald's were more accurate at estimating the calories in their meal than were customers at Subway, apparently because of the health halo created by advertisements like one showing that a Subway sandwich had a third the fat of a Big Mac. The health halo from Subway also affected what else people chose to eat, Dr. Chandon and Dr. Wansink reported last year after giving people a chance to order either a Big Mac or a 12-inch Italian sandwich from Subway. Even though the Subway sandwich had more calories than the Big Mac, the people ordering it were more likely to add a large nondiet soda and cookies to the order. So while they may have felt virtuous, they ended up with meals averaging 56 percent more calories than the meals ordered from McDonald's.

"People who eat at McDonald's know their sins," Dr. Chandon said, "but people at Subway think that a 1,000-calorie sandwich has only 500 calories." His advice is not for people to avoid Subway or low-fat snacks, but to take health halos into account.

"People need to look up calorie information, and this information needs to be clearly available on the menu or on the front of packages," Dr. Chandon said. "If no information is available, people should say to themselves: 'This restaurant or this brand claims to be healthy in general. Let's see if I can come up with two reasons why this claim would not apply to this particular food.' When we asked people to follow this 'consider the opposite' strategy, it completely eliminated health halos."

More generally, Dr. Chandon advises American consumers, food companies and public officials to spend less time obsessing about "good" versus "bad" food.

"Being French, I don't have any problem with people enjoying lots of foods," he said. "Europeans obsess less about nutrition but know what a reasonable portion size is and when they have had too much food, so they're not as biased by food and diet fads and are healthier. Too many Americans believe that to lose weight, what you eat matters more than how much you eat. It's the country where people are the best informed about food and enjoy it the least."

http://www.nytimes.com/2008/12/02/science/02tier.html?nl=8hlth&emc=hltha4

A Scare Forever Etched

By LARRY ZAROFF, M.D

This happened in the 1960s, when I was a young doctor, a fellow in thoracic surgery at a Boston hospital. My patient was 2 years old, a beautiful boy, a Van Gogh sunflower, yellow hair, blue eyes, alert and tranquil despite the near-fatal accident that had put him in the hospital.

His father, a physician, had given him an aspirin. The pill, perhaps too large for his age, had lodged in his windpipe. The doctor, not a surgeon, performed an emergency tracheotomy with a kitchen knife — made a hole in the neck into the breathing tube. He saved his son's life.

At our hospital an expert plastic surgeon revised the makeshift tracheotomy, inserting a silver tube for an airway. Except for the period in the operating room, the father never left his son's side.

The boy recovered remarkably well, breathing through the metal airway without difficulty.

Several weeks after the operation, the silver tube was corked. Again the child did well, able to breathe without difficulty around the tube. After several more weeks at full activity, he was readmitted to the hospital for removal of the tube.

I was the resident on call. And I was well prepared for any eventuality. Or so I thought.

The corked metal tube slid out easily. I placed a small dressing over what was now a hole the size of a dime in the center of his throat. I made rounds, dictated discharge summaries and descriptions of that day's operations. Every hour I checked on the child.

Around 11 that night — a time of silence and emptiness and loneliness in a hospital — I noticed he was breathing faster. Within minutes his color turned dusky, then blue. His airway was blocked. He could not breathe.

It was a crisis, like no other I had faced. From the emergency materials in his room, I took a pediatric bronchoscope, a thin tube with a light at the end, to visualize the airway, and tried to pass it through his mouth into the windpipe.

The bulb blew out. (No fiber optics back then.) I quickly inserted another bulb, which promptly blew. I had no idea how much time had passed. But I knew that in minutes the child would be dead, or at least brain dead.

I had a tracheotomy kit, with surgical instruments to incise the neck and insert a new tube. But I had no assistant.

At that moment, an experienced resident happened by, making late rounds. I grabbed the knife and slashed — no other word works — through the dime-size hole in the boy's neck.

I found the windpipe completely divided. The previous metal tube had been acting only as a stent, supporting the separated parts of the trachea. When the tube was removed, the distal end of the windpipe, its lower half, had collapsed and retracted. That critical part, connected to the lungs, was now under the breastbone, blocked and useless as a conduit for air.

Using a long clamp, I was able to pull the distal end into the wound and hold it open to the air. The child breathed. I did the same.

I then inserted another tracheotomy tube into the lower, divided end. By now the boy was pink and alert. I sutured the new tube in place and then, finished, I felt finished.

I sat for a moment, terrified at what might have been: the death of a child under my care. His father, a physician, just outside.

I recovered enough to talk to the father. His son, I explained, had had an emergency operation to save his life. I called the plastic surgeon, who for the second time revised the tracheotomy in the operating room.

I knew the child would eventually require a definitive repair. But for now he was stable, and so was I.

Such experiences etch the lives of young surgeons. In the following decades of surgical experience, I have never felt as distressed as I did that evening.

In perspective, the event was a great teacher. But one such lesson is enough for a lifetime.

Larry Zaroff teaches medical humanities to undergraduates and medical students at Stanford.

http://www.nytimes.com/2008/12/02/health/views/02case.html?nl=8hlth&emc=hltha8

Exception to the Rule

The percentage of faculty members who are off the tenure track keeps going up, and they are quite possibly in the majority in American higher education. Administrators have justified the hiring pattern — even before the current economic downturn — by saying that they gain flexibility and talent without tenure, and end up saving money as well.

Faculty groups have been pushing back hard against this trend, but with limited success. Even many professors view it as inevitable and argue for a focus on improving pay and benefits for adjuncts.

Elon University, a private institution in North Carolina, offers evidence that institutions can reverse the tide and build up their tenured and tenure-track ranks. In the 1990s, Elon's faculty was split about evenly between adjuncts and those on the tenure track. Today, about 74 percent of professors are either tenured or tenure track. Even with the national economy in turmoil, Elon's leaders say that they plan to continue in this direction until the faculty is about 85 percent tenure track.

Particularly notable, given the concerns of many adjuncts that shifts away from contingent labor will only cost them jobs, is the fact that Elon has hired some former adjuncts into tenure-track jobs, given them credit for their time as adjuncts, and in some cases tenured them.

The impetus for the shift came from faculty members who worked in the mid-1990s on developing a strategic plan for Elon that would distinguish it from other institutions. Elon wouldn't try to compete with research powerhouses like nearby Duke University or the University of North Carolina at Chapel Hill. But it did want to add new programs and to stake a claim about being a place for "engaged learning."

John Sullivan, a professor emeritus of philosophy, is credited with putting the issue of the tenure track front and center when the discussion of "engaged learning" came up. "We were talking about producing a community of learners," and the idea of community was central, he said.

Faculty members wanted to be sure students would have contact with their instructors in class and out of class, and year after year – which isn't easy to ensure if you are relying on adjuncts for many courses.

"If we wanted more commitments of faculty time, we needed to make more commitments to faculty," he said.

While some at Elon were worried about the issue of fairness to adjuncts — an issue that played a role in the discussions — the driving idea was the emphasis on the institution's identity and the faculty role that was seen as necessary to make that identity a reality.

Leo Lambert became president of Elon in 1999, as these discussions solidified. He said that the consensus, which he strongly supported, was that "if we wanted to build the most excellent faculty, we really needed to radically increase our institutional commitment to tenure and tenure-track faculty."

Elon is a "quintessential tuition-driven institution" in terms of its budget. There is no mammoth endowment on which to rely. Lambert said that timing was key to the success of the shift of faculty positions: Elon was attracting more and better applications and students, so this was a period of "institutional confidence" during which trustees and those on campus knew that there would be students to support the new positions. He said he was less sure a college could make such a transformation while worrying over whether students would show up.

The provost, Gerald L. Francis, along with Tim Peeples, then a faculty member and now associate dean of arts and sciences, led the process of identifying – campus-wide – which positions should be converted. Because the college was generally growing its faculty over the period of time in which the tenured ranks grew, adjuncts didn't lose many jobs so much as the new hiring was on the tenure track.

Faculty Status at Elon

Job status	1990-1	2007-8
Tenured	32	135
Tenure-track, but not tenured	22	94
Off the tenure track	78	82

The non-tenure track faculty members, generally instructors without a terminal degree, receive full benefits, based on the same assumption underlying the overall plan: that the university benefits from having teaching done by people who feel part of the community.

Francis said that the new tenure-track slots, while gradually phased in, have covered just about every department.

When administrators at other campuses defend the widespread use of adjuncts, they typically cite the need to assign positions where enrollment is growing. Department chairs at Elon report that enrollments were carefully studied as positions were added on the tenure track. “We’ve had to show some pain first before the gain,” said Chalmers Brumbaugh, chair of political science. The department is doing a search this year for a tenure-track professor, a position that will bring the department to 14 full-time professors, all but two either tenured or on the tenure track. When he arrived at Elon in 1986, there were only three full timers in the department. Brumbaugh said that in discussions about adding positions, “one of the criteria that resonates is the percentage of courses taught by adjuncts.” As the percentage rises, and courses show consistent interest, the college has been adding new positions. “When I say that I have to keep adding sections, that argument resonates,” he said.

While Elon has hired many high quality adjuncts over the years, Brumbaugh said that there is no comparison in his mind in what tenure-track faculty offer students. “They can take advisees, they can spend more time with the student,” he said. “Adjuncts, as good as they may be in the classroom, may have an office hour here or there, but they are not part of the institution and the institutional culture in the same way.”That view is shared by professors who started at Elon as adjuncts and were able to switch to the tenure track and earn tenure. Yoram Lubling, a professor of philosophy, arrived in 1991 for a one-year replacement position. That turned into a series of one-year contracts off the tenure track — what he calls “full work and part pay.” In 1996, he won a permanent slot off the tenure track, and in 1998 he was hired for a tenure-track position when his department received one. He was given some credit for his teaching prior to joining the tenure track, so he came up for tenure and received it in 2002.

Since joining the tenure tack, Lubling has been able to step up writing in a way that would have been impossible for him before. He just published a book about the prisoners’ revolt in the Treblinka concentration camp, and he’s under contract for a book about John Dewey.

In many ways, he said, the writing time doesn’t come from not teaching, but from not job hunting and not worrying. “In the humanities, jobs are very scarce, so not having tenure and being on a yearly contract makes it impossible to actually have an academic career,” he said. “You are constantly preoccupied with finding jobs.” At the beginning of his Elon career, he said, “it felt like all I was doing was worrying about where I’m going to teach the following year.”

As a tenured faculty member, in contrast, “you feel the university has made a commitment.”

— Scott Jaschik

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/12/02/elon.

The Mental Health of Students and Non-Students

Ever since the killings at Virginia Tech last year, there has been widespread speculation about the relative incidence of mental health disorders among college students. A new study in *The Archives of General Psychiatry* finds that such disorders are common, and that far fewer students receive treatment than one might like. But the study — believed to be the largest national comparison of the mental health of college students and comparably aged non-students — finds that non-students are as likely to have mental health disorders and as unlikely to seek treatment as their peers in college.

The study is based on face-to-face interviews for the 2001-2 National Epidemiologic Survey on Alcohol and Related Conditions, which involved more than 5,000 individuals aged 19-25. Almost half of them, both in college and not, had some disorder, while only a minority in either group sought treatment.

The seven members of the research team that produced the study saw cause for both concern and optimism in their results. “The vast majority of disorders in this population can be effectively treated with evidence-based psychosocial and pharmacological approaches,” the study says. “Early treatment could reduce the persistence of these disorders and their associated functional impairment, loss of productivity, and increased health care costs. As these young people represent our nation’s future, urgent action is needed to increase detection and treatment of psychiatric disorders among college students and their non–college-attending peers.”

The authors are all researchers at Columbia University, the National Institutes of Health, and the New York State Psychiatric Institute.

While the overall trends were similar for both groups of young people, there were some differences. The odds of alcohol use disorders were far greater for college students than for non-students. At the same time, college students were less likely than non-college students to have received treatment in the past year for conditions related to alcohol or drug use (5 percent vs. 9 percent of those with the condition).

College students are less likely than non-students to have nicotine dependence or bipolar disorder.

Here are some of the data, which cover a 12-month period.

Psychiatric Disorders, Personality Disorders and Substance Abuse in Students and Non-Students, 19-25

Condition	% in College Students	% in Non-Students
Any psychiatric diagnosis	45.8%	47.7%
Any substance abuse disorder	29.1%	31.5%
—Alcohol	20.4%	17.0%
—Drugs	5.1%	6.9%
—Nicotine dependence	14.6%	20.7%
Mood disorders	10.6%	11.9%
—Bipolar disorder	3.2%	4.6%
Anxiety disorders	11.9%	12.7%
—Social anxiety	3.2%	3.5%
—Specific phobias	8.1%	8.8%
Pathological gambling	0.4%	0.2%

Any personality disorder	17.7%	21.6%
—Obsessive-compulsive	8.2%	8.0%
—Paranoid	4.9%	8.7%
—Schizoid	3.3%	5.6%
—Anti-social	4.7%	8.5%

— Scott Jaschik

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/12/02/mental

Preservation and Development, Engaged in a Delicate Dance

By ROBIN POGREBIN

The battle lines were familiar. Churning out petitions and clamoring at hearings, hundreds of city residents had mobilized to protest a plan by St. Vincent's Hospital to replace nine buildings in the Greenwich Village Historic District with a 20-story medical center and condominiums.

On the other side were the Rudin Management Company, one of the city's largest developers, and St. Vincent's, which argued that a new building and income from the condo deal were vital to saving the hospital and meeting Manhattan's health needs.

In the middle, as usual, was the Landmarks Preservation Commission, which was struggling this year to make a judgment call under the klieg lights as city politicians took positions for and against.

Over a decade of whirlwind development, the Landmarks Preservation Commission has repeatedly played dance partner to a potent mix of preservationists, developers and city politicians. It must strike a balance between protecting architecture and accepting economic realities, between a responsibility to history and a knowledge that the city must evolve.

"It's the way government is," said Robert B. Tierney, an appointee of Mayor Michael R. Bloomberg who has been the chairman of the landmarks commission since 2003. "It's making choices and, without unlimited resources, having to make those choices and being able to do some things and not do other things."

In the case of St. Vincent's, the commission initially rejected the hospital's plan, objecting to the height and bulk of the new buildings and invoking the aesthetic value of the old ones. Then St. Vincent's reduced the scale of its project and resubmitted an application for permission to demolish the O'Toole building, the likely site for the new 20-story medical tower, citing physical hardship. A distinctive, sawtooth-sided low white 1964 structure on Seventh Avenue between 12th and 13th Streets, the O'Toole is valued by many Village residents and devotees of midcentury Modernism.

Riven on the issue, the commission assented to its demolition last month in a 6-to-4 vote.

Further approval is still needed from city and state agencies.

"This is the real world, where there are pressures," said Christopher Moore, who voted with the majority and has served as a commissioner since 1995. "And sometimes you have to give squares to get squares."

Yet some preservationists and politicians assert that, under a mayoral administration that has emphasized new construction — from behemoth stadiums to architecturally bold condo towers — big developers have too often been allowed to lead on the dance floor. Some accuse the landmarks commission, charged with guarding the city's architectural heritage, of backing off too readily when important developers' interests are at stake.

"The real estate industry controls the agenda in the city," said Tony Avella, a city councilman from Queens. "If they don't want something to happen, it doesn't happen. They pull the strings from behind the scenes, whether in rezoning reform or landmarking. It's just incredible how much influence they have."

"The direction comes from the mayor, and the mayor's pro-development," Mr. Avella added.

Patricia E. Harris, the first deputy mayor, who oversees the commission, counters that the administration has been vigilant in protecting the city's landmarks. "We don't think about development without thinking

about preservation," she said in an e-mail message. (She agreed to reply only to questions submitted in writing.) "During a time of unprecedented growth, preservation has always been front and center."

Even as preservationists argue that development has trumped preservation under Mayor Bloomberg, some architectural historians suggest that the traditional divide between the two should be rethought.

Preserving sections of old New York can actually spur economic renewal, they say, citing areas like TriBeCa, where the designation of a new historic district in 1992 accelerated the area's transformation into one of the city's most sought-after neighborhoods.

"There hasn't been enough attention to how new development can work with old buildings," said Andrew S. Dolkart, the director of the historic preservation program at Columbia University. "That's the biggest flaw in New York and preservation in the last decade — it's just ignored. All things considered, a relatively tiny proportion of New York land is landmarked. It's hardly an obstacle to economic growth in the city."

Developers tend to disagree. "Landmarking is one of the best tools that anti-development people have in this city — it's a very long, political process," said Jed Walentas, vice president of Two Trees Management Company, which as the main property owner in Dumbo has led that neighborhood's transformation from an industrial district into an upscale Brooklyn neighborhood. Last December the area was named a historic district by the landmarks commission.

Some developers accuse preservationists of routinely fighting development even when the buildings or districts are of questionable importance.

"I am pro-landmark, but I do think it is abused considerably," said Martin J. McLaughlin, a leading city lobbyist, who has represented developers before the commission. "It's too easy to say, 'The big bad developers.' There are big bad developers, but you're not supposed to use landmarks to stop development."

Both developers and preservationists try to enlist their local City Council members in fighting for or against potential landmarks. The council is often a pivotal player, since it must approve any designation and can overturn a landmarks commission decision.

In October 2005, for example, the Council vetoed the designation of the Jamaica Savings Bank building in Elmhurst, Queens, built in 1968 with striking geometry, and Cass Gilbert's 1913 Austin, Nichols waterfront warehouse in Williamsburg, Brooklyn, an Egyptian Revival structure that is being remade into luxury apartments.

Often developers and building owners make campaign contributions to City Council members during a designation process. Developers have also spent considerable sums on lobbying the landmarks commission, along with other city agencies.

In 2004 Greenwich Village preservationists enlisted the support of Christine C. Quinn, who represented the area on the City Council and is now Council speaker, in their fight to extend the existing historic district. The original 1969 designation had omitted the far west Village, home to many 19th-century converted loft buildings, row houses and other low-rise structures evoking the area's industrial and maritime past. Since the 1980s, 16 residential high rises had been built in the neighborhood, and more were in the works.

A formal request was filed in October 2004 with the landmarks commission seeking an extension that stretched to the Hudson River.

But as the commission defined the extension's boundaries, some village residents were distressed by the omission of two historic buildings: the Superior Ink building, built in 1919 as a Nabisco cracker bakery with twin tall smokestacks, and Whitehall Storage, a four-story 1938 building with ribbons of casement windows — among the last operating factory buildings along the river.

Meanwhile, developers made their own efforts in hearings, private meetings and letters to persuade the commission to leave their properties out or not to extend the district at all. The Witkoff Group was planning to build a 15-story residential tower atop Whitehall Storage; Related Companies wanted to raze Superior Ink and build a condo tower and town houses.

In May 2006 the commission approved the extension of the historic district, but excluded Superior Ink and Whitehall Storage. For preservationists the victory was bittersweet. "The Superior Ink building was really iconic to us, part of a broader complex of factories," said Andrew Berman, executive director of the Greenwich Village Society for Historic Preservation. "We thought it was a really important piece of the neighborhood to hold onto."

Today a 17-story luxury condo tower called Superior Ink and a row of Neo-Classical town houses are rising on the site at West and Bethune Streets.

Mr. Tierney, the landmarks commission chairman, said that Superior Ink was left out not because of development pressures, but because it "wasn't contiguous with the historic district."

"It was a question based on the merits, and how it connects to the rest of the district and what the other competing priorities are," Mr. Tierney said.

Related Companies and its chairman and chief executive, Stephen M. Ross, declined to be interviewed for this article. The Witkoff Group did not respond to messages seeking comment.

Donald G. Presa, a commission researcher for 22 years, said he and his colleagues do not consider development interests when drawing up boundaries. "That's not an issue that the staff deals with," he said. "We don't consider that at all."

He added that defining boundaries was a fraught task that staff members approach carefully. "Very few districts have natural boundaries," Mr. Presa said. "We agonize so much about where to end a district. You have to draw the boundary line somewhere, or all of New York becomes an historic district."

The commission has occasionally directly stood up to developers; it recently sent the real estate magnate Aby Rosen back to the drawing board with the architect Norman Foster on a proposal to build a 30-story tower over the Parke-Bernet Gallery building, at 980 Madison Avenue, at 76th Street, on the Upper East Side. Residents protested the project, and the commissioners deemed its scale out of character with the rest of the neighborhood. The agency has yet to vote on Mr. Foster's revised design.

Yet the commission is faulted for refusing to schedule public hearings on some of the most fiercely contested projects, like Ward's Bakery, an imposing terra-cotta-tiled structure that lay within the 22-acre footprint of the Atlantic Yards project in Brooklyn. In 2006 the commission's staff determined that the building was not eligible for a hearing on landmark designation. Yet it was ruled eligible for a listing in 2003 on the National Register of Historic Places. Forest City Ratner tore down the bakery this year.

"This appears to be a political decision by the landmarks commission," Daniel Goldstein, a spokesman for the group Develop Don't Destroy Brooklyn, was quoted as saying at the time. "It is deeply frustrating that they have let politics enter their deliberation on a building that clearly deserves landmark status."

A commission spokeswoman said of the bakery, “There are many other industrial structures like it around the city, and it had several branches throughout the city.”

Most notably, the landmarks commission was accused of succumbing to political and development pressures when it refused to schedule a public hearing on 2 Columbus Circle, the 1964 building by Edward Durell Stone known for its Venetian-style touches, portholes and “lollipop” columns. After a sweeping redesign by the architect Brad Cloepfil, the building reopened in September as the new home of the Museum of Arts and Design.

A Freedom of Information request in 2004 by Landmark West!, a preservation group, brought to light e-mail exchanges between Mr. Tierney and Laurie Beckelman, a former landmarks commission chairwoman who led the museum’s effort to buy 2 Columbus Circle from the city.

The day after Community Board 5 voted in favor of the city’s sale of the building, Ms. Beckelman wrote: “We got the vote 18-8, but I see trouble ahead. Thanks for all of your support.”

Mr. Tierney replied: “Let me know how I can help on the trouble ahead. Bob.”

Landmark West! filed a lawsuit accusing Mr. Tierney of collusion and seeking his removal from any decision on 2 Columbus Circle. The case was dismissed in September 2005.

Complicating the dance, the big players sometimes change sides.

Robert A. M. Stern, dean of the Yale School of Architecture and former head of the historic preservation program at Columbia University, for example, was among the most prominent defenders of 2 Columbus Circle. He not only faulted the city and the art museum for their decision, but also criticized Mr. Cloepfil for accepting the commission.

“I find it hard to believe that any architect can’t be a preservationist,” he said in a recent interview. “Picasso didn’t say, ‘I don’t like Goya,’ in fact the opposite: he said, ‘I’m going to learn from Goya and Velásquez and other artists.’ ”

Yet Mr. Stern was also the architect behind the soaring condo developments made possible by the razing of Superior Ink in the West Village and the Dakota Stables on Amsterdam Avenue at 77th Street.

Asked whether he saw a contradiction in his stance, Mr. Stern said: “I’ve made judgments. Some buildings are not worth saving.”

As for the landmarks commission’s judgments about which buildings are worth saving, preservationists suggest that the current economic slump may prompt frank discussion in the city of what was sacrificed in a decade-long boom without a hearing by the agency.

“They really need to look at a way to be more forthcoming, more explanatory, so you could at least understand their reasoning,” Peg Breen, the president of the advocacy group New York Landmarks Conservancy, said of the preservation commission.

Without that, she said, “It opens them to never-ending argument.”

http://www.sciencedaily.com/releases/2008/12/081201200215.htm

Young Gymnasts Suffering New Types of Injuries, MRI Shows

An x-ray image illustrating an irregular and widened growth plate of the hand (arrow). The irregularity is caused by repetitive trauma and can result in shortening and deformity. (Credit: Image courtesy of Radiological Society of North America)

ScienceDaily (Dec. 2, 2008) — Adolescent gymnasts are developing a wide variety of arm, wrist and hand injuries that are beyond the scope of previously described gymnastic-related trauma, according to a study presented December 1 at the annual meeting of the Radiological Society of North America (RSNA).

"The broad constellation of recent injuries is unusual and might point to something new going on in gymnastics training that is affecting young athletes in different ways," said the study's lead author, Jerry Dwek, M.D., an assistant clinical professor of radiology at the University of California, San Diego and a partner of San Diego Imaging at Rady Children's Hospital and Health Center.

Previous studies have reported on numerous injuries to the growing portion of adolescent gymnasts' bones. However, this study uncovered some injuries to the bones in the wrists and knuckles that have not been previously described. In addition, the researchers noted that these gymnasts had necrosis, or "early death," of the bones of their knuckles.

"These young athletes are putting an enormous amount of stress on their joints and possibly ruining them for the future," Dr. Dwek said.

The radius is the bone in the forearm that takes the most stress during gymnastics. Due to damage to the radial growth plates, the bone does not grow in proportion to the rest of the skeleton and may be deformed. Consequently, it is not unusual for gymnasts to have a longer ulna than radius. Some former

gymnasts must undergo surgery to shorten the ulna and regain the proper fit of the wrist bones into the forearm.

Dr. Dwek and coauthor Christine Chung, M.D., used MRI to study overuse injuries seen in the skeletally immature wrists and hands of gymnasts. The researchers studied wrist and hand images of 125 patients, age 12 to 16, including 12 gymnasts with chronic wrist or hand pain.

"We were surprised to be looking at injuries every step down the hand all the way from the radius to the small bones in the wrist and on to the ends of the finger bones at the knuckles," Dr. Dwek said. "These types of injuries are likely to develop into early osteoarthritis."

Dr. Dwek suggested that additional study is needed to understand how gymnastic stresses are causing these injuries.

"It is possible that by changing the way that practice routines are performed, we might be able to limit the stress on the joints and on delicate growing bones," he said.

Adapted from materials provided by Radiological Society of North America.

http://www.sciencedaily.com/releases/2008/12/081201081913.htm

Bariatric Surgery May Resolve Liver Disease

ScienceDaily (Dec. 2, 2008) — Obesity is a growing epidemic in the U.S. with a significant increase in prevalence from 15 percent to 32.9 percent from 1980 to 2004. Nonalcoholic fatty liver disease (NAFLD) is an emerging problem related to the obesity epidemic, becoming one of the most common causes of liver disease in the nation.

Bariatric surgery has become a popular and effective method for rapid and permanent significant weight loss in morbidly obese individuals. A recent study reports bariatric surgery results in improvement of histopathological features of NAFLD. Complications of NAFLD, including steatosis, steatohepatitis and fibrosis appeared to improve or completely resolve in a majority of patients after bariatric surgery-induced weight loss, according to results of a study published in Clinical Gastroenterology and Hepatology, an official journal of the American Gastroenterological Association (AGA) Institute.

"Even today, the effect of weight loss after bariatric surgery on the liver, particularly NAFLD, remains unclear. There is a lack of well-defined trials exploring this relationship," said Gagan K. Sood, MD, of the University of Texas Medical Branch and lead author of the study. "Our team assessed and quantified this effect and found encouraging news: a majority of patients experience complete resolution of NAFLD after bariatric surgery, and the risk of progression of inflammatory changes and fibrosis seems to be minimal."

For this meta-analysis, 15 studies were selected for final data extraction. The mean age of the participants at the time of weight loss surgery ranged from 35.6 to 49 years. Mean BMI at the time of weight loss surgery ranged from 43.9 to 56 kg/m^2 and the mean BMI at follow-up liver biopsies ranged from 28.6 to 39kg/m^2. Percentage reduction in mean BMI values ranged from 19.11 to 41.76.

The pooled proportion of patients with improvement or resolution in steatosis was 91.6 percent, steatohepatitis was 81.3 percent, fibrosis was 65.5 percent and complete resolution of NASH was 69.5 percent.

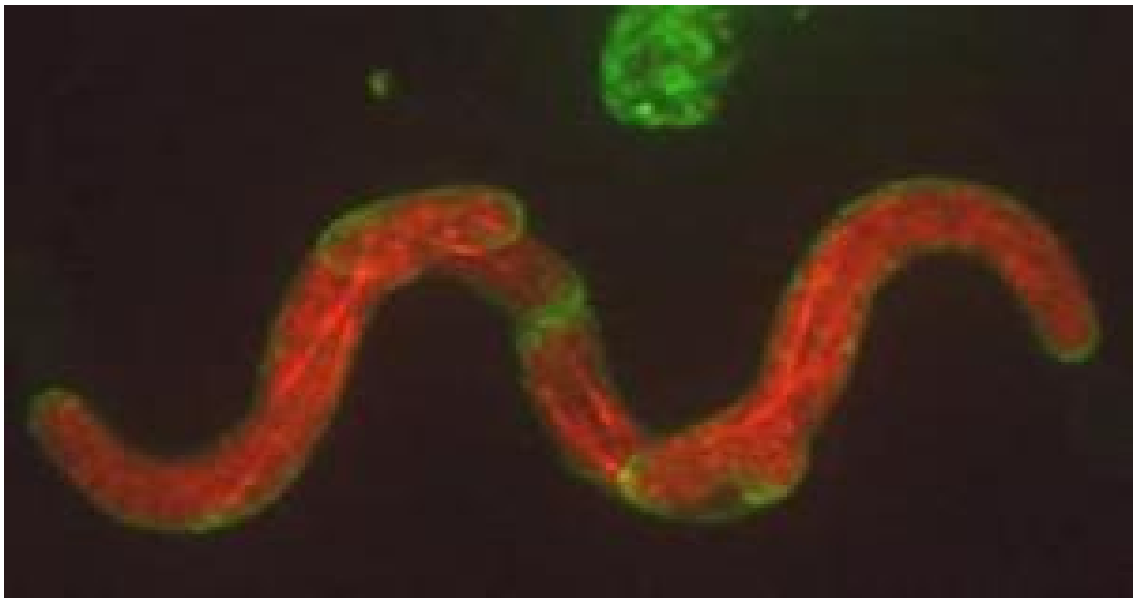
Generalizability of these results may require confirmation from multi-center, large scale, well designed trials. Future studies need to be done using uniform histopathological criteria for liver biopsy specimens.

NAFLD encompasses a range of conditions involving the liver that affect people who drink little or no alcohol. The spectrum of NAFLD ranges from hepatic steatosis (fat accumulation in the liver cells) to the more severe non-alcoholic steatohepatitis (NASH) and fibrosis that can progress to cirrhosis, end-stage liver disease, and hepatocellular carcinoma. Prevalence of NAFLD is estimated to be around 70 percent in obese individuals and 85 percent to 95 percent in patients with morbid obesity. The prevalence of NASH is as high as 18.5 percent in obese individuals and 33 percent in those who are morbidly obese. The pathophysiologic mechanisms of NAFLD have not been clearly elucidated as yet, but obesity and insulin resistance are considered to be the main causative factors.

Adapted from materials provided by American Gastroenterological Association, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/12/081201081907.htm

Cells Reorganize Shape To Fit The Situation, Scientists Discover



Microtubule and membrane dynamics of yeast cells inside a curved channel -- new cell tip formation. (Credit: Phong Tran, PhD, University of Pennsylvania School of Medicine)

ScienceDaily (Dec. 1, 2008) — Flip open any biology textbook and you're bound to see a complicated diagram of the inner workings of a cell, with its internal scaffolding, the cytoskeleton, and how it maintains a cell's shape. Yet the fundamental question remains, which came first: the shape, or the skeleton?

Now a research team led by Phong Tran, PhD, Assistant Professor of Cell and Developmental Biology at the University of Pennsylvania School of Medicine, has the answer: both.

The findings, published online this week in the journal Current Biology by co-senior authors Tran and Matthieu Piel of the Institut Curie, Paris, combine genetics, live-cell imaging, and microfluidics technology. They were able to force normally rod-shaped yeast cells to grow within tiny curved channels. Using the channels, they made rod-shaped cells deform into curved-shaped mutant cells and conversely, curved-shaped cells straighten out into a rod. The surprising finding: as the cells bend, they reorganize their cytoskeleton, and as they reorganize their internal skeletons, the cells further adjust their shape.

Cell shape gone awry has been implicated in some forms of cancer. In the future, one potential implication of Tran's findings is that it might be possible to rescue certain disease states via squeezing or otherwise applying mechanical pressure to tissues or organs. But that, he concedes, is "completely science fiction on my part." Instead, he says at this point this study is pure, basic research. "It was just a cool experiment."

The findings point to a type of feedback loop. "The cytoskeleton changes the shape of the cell and the shape of the cell also changes the organization of the cytoskeleton," he says. "In fact they feed back on each other, so any perturbation on one system will change the other, and visa versa."

The results validate a common belief among cell biologists, says Tran – that to cause a cell to form a branching projection, such as filopodia or dendrite, or new shape, simply adjust the cytoskeleton accordingly, and the shape will follow suit.

"Our demonstration is a conclusive and direct demonstration of that theory because we used normally rod-shaped cells, as opposed to indirect proof of the concept using mutant cell shapes," he says.

At least five cellular components are required for making changes to the organization of the cytoskeleton and therefore the shape of a cell: microtubules, actin filaments, the cell membrane, and two protein complexes. Microtubules are hollow protein pipes that arrange themselves in bundles down the long axis of the cell. As they extend from the cell center towards the periphery, they carry with them one of the protein complexes, so that when they finally dock with a protein receptor at the cell membrane, the effect is to deliver the complex to the desired growth point. What follows is a cascade of events: This complex recruits the second protein complex, which in turn recruits the protein actin. Filaments of actin from this site bring the transport machinery necessary for new cell membrane to extend in the intended direction – generally, further along the long axis of the cell.

Essentially, what Tran's team, led by technician Courtney Terenna, found was that if normal yeast cells are forced to bend, their microtubules can no longer reach the old tip of the cell and so form new growth tips. Conversely, they also found that mutant yeast cells normally grow bent or round, if forced to grow in straight channels, will adopt cytoskeletal structures that are the normal rod-shape.

This, says Tran, could in theory partially explain why some cells from mouse knock-outs, when grown in two-dimensional tissue culture, have more severe problems than when grown in a three-dimensional animal. The researchers surmise that the three-dimensional architecture of a tissue inside a living organ rescues cytoskeletal abnormalities that otherwise arise in an artificial two-dimensional construct.

The study stems from an international collaboration between the microfluidics experts in Piel's group and the biology experts in Tran's. Co-first authors Terenna and Tatyana Makushok, a graduate student in Piel's group, funded by a Human Frontier Science Program (HFSP), an international organization funded by various countries, traveled to Paris and Philadelphia, respectively, to learn their counterpart's secrets so they could then proceed independently.

Now Tran's group is working to address several questions that arise from this research. First, how long can mutant cells maintain their wild-type phenotype once they are removed from the physical constraints of the microfluidic channel? How do the two protein complexes work together to affect cell shape? And, what effects do other environmental variables, such as temperature, have on cytoskeletal dynamics?

Tran's lab is funded by the National Institutes of Health, the American Cancer Society, and the HFSP.

Adapted from materials provided by University of Pennsylvania School of Medicine.

http://www.sciencedaily.com/releases/2008/11/081124131243.htm

Real-time Beethoven

We can still play with Beethoven's works. And today's composers have been given a completely new instrument: a computer program for the processing of sound, where the actual act of composing is an integral part of the instrument itself. And where the composition takes place simultaneously with a performance, in real time. (Credit: Illustration: Line Halsnes/NTNU Info)

ScienceDaily (Dec. 1, 2008) — Now, you can compose and perform in the same few milliseconds. And the variations you can make on a single theme are infinite.

Imagine a concert hall and a stage, with a symphony orchestra that has performed Ludwig van Beethoven's Ninth symphony, with the addition of electric instruments and loudspeakers.

Imagine, if you will, the composer himself (whom we'll pretend for the occasion is not deaf), who strolls around between the orchestra members on the stage, while they start on the fourth movement.

Wielding his own instrument, a hybrid between a laptop and a sound generator, the composer soaks up the different tones, processes them, and sends them back in ever-changing variations.

"Ode to Joy" is sampled (digitized), producing new and unexpected phrasing - but at the same time, the basic theme is instantly recognizable. The symphony is completely altered, in ever-changing varieties, because the composer is a part of the performance of his composition.

Infinite variations

Unfortunately for old Ludwig himself, this musical vision comes 200 years too late. But we can still play with Beethoven's works. And today's composers have been given a completely new instrument: a computer program for the processing of sound, where the actual act of composing is an integral part of the instrument itself. And where the composition takes place simultaneously with a performance, in real time - live, as it is called in music-speak.

This new invention is a tool for both improvisation and variation, a computer program and a musical instrument all rolled up into one. Call it a computer instrument. Its developer is just 36 years old; his name is Øyvind Brandtsegg, from the Norwegian University of Science and Technology (NTNU).

Brandtsegg is a composer, a musician and computer programmer. The instrument is his PhD research.

We're talking about a new type of sound generator, a particle synthesizer. It takes a stanza – a guitar riff, a verse line, a drum solo, or any recorded sound – and splits the sound into a number of very short sound particles that can last for between 1 and 10 milliseconds.

These fragments may be infinitely reshuffled, making it possible to vary the music with no change in the fundamental theme.

"It's easy to change a bit of music into something that can't be recognized. It's the opposite that is the challenge: to create variations in which the musical theme remains clear," says Brandtsegg.

New and better energy

Brandtsegg has created a new link between composition and improvisation with his new instrument. In a way, he's rediscovered the energy of a piece in a new and much better form. What he's doing is something that jazz musicians have always done – they have a composition as the foundation, and then they go up on the podium and play variations on the basic theme.

But there are limits to what even Louis Armstrong can coax out of a trumpet. "This instrument allows me to expand the musical palette with new tonal variations and timbres. It is also the first time that the actual composition process can be controlled in real time", Brandtsegg says.

Work that previously required paper, pencil (and an eraser!) and many hours, can be done in the blink of an eye, with an instrument on stage, says the composer. This allows for new ways of thinking about music composition.

Brandtsegg has also developed ImproSculpt, software that make it possible to sample surroundings during a presentation, and to control the process using a body sensor. He also plays the Marimba Lumina, a percussion instrument that has been electronically modified so that the player can alter the sound by the way he or she strikes the instrument.

Adapted from materials provided by The Norwegian University of Science and Technology (NTNU), via AlphaGalileo. Original article written by Tore Oksholen/Gemini.

http://www.sciencedaily.com/releases/2008/11/081121081055.htm

New Approaches Make Retinal Detachment Highly Treatable

ScienceDaily (Dec. 1, 2008) — Retinal detachment, a condition that afflicts about 10,000 Americans each year, puts an individual at risk for vision loss or blindness. In a new study in the New England Journal of Medicine, a leading ophthalmologist at NewYork-Presbyterian Hospital/Weill Cornell Medical Center writes, however, that a high probability of reattachment and visual improvement is possible by using one of three currently available surgical techniques.

"Although no randomized trials have been conducted that show definitively that one procedure is best for every situation, improvements in these surgical techniques have led to effective treatments for most patients," says Dr. Donald J. D'Amico, ophthalmologist-in-chief at NewYork-Presbyterian Hospital/Weill Cornell Medical Center, professor and chairman of ophthalmology at Weill Cornell Medical College, and an international leader in vitreoretinal surgery.

Although relatively rare, retinal detachment can occur when holes, tears or breaks appear in the light-sensitive retina as a result of trauma or pulling away of the gelatinous mass, known as the vitreous, that fills the back of the eye. Retinal tears occur most often in adults over age 60, but may occur much earlier, particularly in those with high myopia. The sudden onset of light flashes and "floaters" could be the warning signs of an impending retinal detachment, although these symptoms do not always mean that a retinal tear has occurred. Surgery is the only treatment for a retinal detachment.

Dr. D'Amico offers his recommendations for treating a 57-year-old man who experiences sudden flashes and floaters in one eye, progressive loss of vision and a retinal detachment in the article, "Primary retinal detachment."

The three surgical options currently in use to treat such a case are:

1. **Scleral Buckling.** A common way to treat a retinal detachment, scleral buckling surgery has been performed with success for several decades. In this procedure, a piece of silicone is sutured onto the outside wall of the eyeball and left in place permanently to create an indentation, or buckle, that restores contact with the detached retina. The individual tears are then closed by a localized scar that is induced with a freezing probe or laser. According to Dr. D'Amico, scleral buckling is a relatively involved procedure and requires the use of a hospital operating room. It is usually performed on an outpatient basis with local anesthesia with intravenous sedation, and the overall success rate for reattachment is about 90 percent.
2. **Pneumatic Retinopexy.** A newer and less invasive procedure than scleral buckling, pneumatic retinopexy is usually done in the retina specialist's office under local anesthesia. The procedure involves injecting a gas bubble into the vitreous cavity of the eye, then positioning the patient's head so that the bubble floats to the break in the detached retina. The bubble spans and closes the retinal break, and this allows the natural forces in the eye to reattach the retina. The break is permanently sealed by the application of a freezing probe or laser to create a scar around the break. The gas bubble then resolves over several days, and in successful cases, the retina is left reattached without a trip to the operating room, and with no permanent buckling material applied to the eye. According to Dr. D'Amico, pneumatic retinopexy is not suitable for every patient and has a somewhat lower success rate with initial treatment than does scleral buckling or vitrectomy. Nevertheless, he says, because of its minimally invasive attributes, and the fact that an attempted pneumatic does not reduce the ultimate chance for success if additional surgery is required for recurrent detachment, patient and surgeons increasingly select pneumatic retinopexy for suitable primary retinal detachments after a careful discussion of the limitations.
3. **Vitrectomy.** In contrast to scleral buckling, vitrectomy is a surgery within the eye in which the vitreous gel is removed. Because vitreous traction is the typical cause of the retinal tears in a detachment, this approach has the advantage of directly attacking the underlying cause of the detachment. Vitrectomy surgery -- a few decades old -- is a newer surgery than scleral buckling, and it is continually improving due to innovations in instrumentation and technique. Recent

studies have shown success rates comparable to those of scleral buckling. Dr. D'Amico notes that there is a very strong shift toward vitrectomy, and away from buckling, for retinal detachment, particularly by younger surgeons and for patients that have detachment after cataract surgery. Vitrectomy for detachment may be associated with a higher risk of postoperative cataract, and this appears to be its main disadvantage compared to buckling, which has lower risk of cataract but higher risk of other complications. In cases where bleeding in the vitreous gel is present with the detachment, a vitrectomy approach is clearly preferred to remove the vitreous hemorrhage in order to gain better visualization to find and repair tears or holes in the retina. Vitrectomy, like scleral buckling, is typically done on an outpatient basis with local anesthesia with intravenous sedation.

For the patient described in the vignette who went to his ophthalmologist with classic symptoms of primary retinal detachment, including flashing lights, floaters and progressive loss of vision, Dr. D'Amico's first recommendation would be to perform a pneumatic retinopexy. "I would select this option for this patient because this specific detachment is well-suited to pneumatic retinopexy by virtue of the retinal breaks being located close together in the superior retina, which is the easiest location to treat with an intraocular gas bubble. Furthermore, the procedure can be done immediately in the doctor's office at lower cost and with fewer risks of complications, compared to buckling or vitrectomy, and it also compares quite favorably with the other procedures with having a 75 percent chance of restoring vision to 20/50 or better after this minimally invasive procedure," Dr. D'Amico says.

As with any surgery, there are risks associated with each of these techniques. For example, vitrectomy can cause cataract or elevated pressure inside the eye, especially in people with glaucoma; scleral buckling can cause a change in the shape of the eye that may require alteration of the eyeglass prescription; and pneumatic retinopexy often requires more than one surgery to reattach the retina.

"The benefits of surgery, however, far outweigh the risks," says Dr. D'Amico, who performs all of these procedures. "No matter which procedure the surgeon chooses, there is a very good chance today that a patient's retina can be reattached and his or her vision preserved."

Journal reference:

1. . **Primary Retinal Detachment**. *New England Journal of Medicine*, November 26, 2008

Adapted from materials provided by New York- Presbyterian Hospital/Weill Cornell Medical Center/Weill Cornell Medical College, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/11/081126215258.htm

Brain's Magnetic Fields Reveal Language Delays In Autism

A research subject reads instructions on a screen while seated with his head surrounded by the MEG's magnetic detectors. (Credit: Children's Hospital of Philadelphia)

ScienceDaily (Dec. 1, 2008) — Faint magnetic signals from brain activity in children with autism show that those children process sound and language differently from non-autistic children. Identifying and classifying these brain response patterns may allow researchers to more accurately diagnose autism and possibly aid in developing more effective treatments for the developmental disorder.

Timing appears to be crucial. "Children with autism respond a fraction of a second more slowly than healthy children to vowel sounds and tones," said study leader Timothy Roberts, Ph.D., vice chair of radiology research and holder of the Oberkircher Family Endowed Chair in Pediatric Radiology at The Children's Hospital of Philadelphia. Roberts used a technology called magnetoencephalography (MEG), which detects magnetic fields in the brain, just as electroencephalography (EEG) detects electrical fields.

Roberts presented his findings today at the annual meeting of the Radiological Society of North America in Chicago. "The brain's electrical signals generate tiny magnetic fields, which change with each sensation, and with communication among different locations in the brain," he added.

Roberts is working to develop "neural signatures" that can link recorded brain activity to particular behaviors in children with autistic spectrum disorders (ASDs), which are characterized by impaired development in communications and social functioning. "Our hypothesis is that speech and other sounds come in too fast for children with ASDs, and their difficulties in processing sound may impair their language and communication skills," said Roberts.

Physicians already use MEG to map the locations of abnormal brain activity in epilepsy, but the technology Roberts used is one of the few MEG machines available in a dedicated pediatric facility. In the current study, the researchers evaluated 64 children aged six to 15 at The Children's Hospital of Philadelphia. Thirty children had ASDs, the rest were age-matched, typically developing control subjects.

The MEG machine has a helmet that surrounds the child's head. The researchers presented a series of recorded beeps, vowels and sentences. As the child's brain responded to each sound, noninvasive magnetic detectors in the machine analyzed the brain's changing magnetic fields.

When sounds were presented, the MEG recorded a delay of 20 milliseconds (1/50 of a second) in the brain's response for children with ASDs, when compared with healthy control subjects. "This delay

indicates that auditory processing is abnormal in children with autism, and may lead to a cascade of delay and overload in further processing of sound and speech," said Roberts. "Further research may shed light on how this delay in processing sounds may be related to interconnections among parts of the brain." Other testing, measuring a response to mismatched or changed sounds, found longer delays, up to 50 milliseconds (1/20 of a second).

Because autism disorders range across a spectrum of functional abilities, explained Roberts, neural signatures based on brain responses may allow clinicians to more accurately diagnose which subtype of ASD an individual patient has. Such diagnoses may be possible at an earlier age if future studies show that such signatures are detectable in infancy—at younger ages than in the children involved in the current study. "Earlier diagnosis of ASDs may allow clinicians to intervene earlier with possible treatments," said Roberts.

Furthermore, added Roberts, if a patient's neural signature overlaps with that found in another neurological condition, such as epilepsy or attention-deficit hyperactivity disorder, for which a treatment exists, that patient may benefit from such a treatment.

The National Institutes of Health, the Nancy Lurie Marks Family Foundation, and the Jeffrey and Christina Lurie Family Foundation provided funding support for the study. Co-authors with Roberts were J. Christopher Edgar, Ph.D.; Deborah M. Zarnow, M.D.; and Susan E. Levy, M.D.; all of Children's Hospital.

Adapted from materials provided by Children's Hospital of Philadelphia.

http://www.sciencedaily.com/releases/2008/12/081201081710.htm

Drivers Distracted More By Cell Phones Than By Passengers

University of Utah psychology graduate students Russ Costa and Janelle Seegmiller demonstrate the driver and passenger roles used by participants in a study of how drivers are affected by conversations with passengers versus conversations over a cell phone. The study, which used the sophisticated driving simulator shown in the photo, found that when drivers talk on cell phones, they are more likely to drift out of their lane and miss exits. (Credit: Nate Medeiros-Ward)

ScienceDaily (Dec. 1, 2008) — Drivers make more mistakes when talking on a cell phone than when talking to passengers, new research shows.

This finding addresses the common question about whether driver distraction comes from cell-phone use specifically or conversation generally.

Even when drivers used a hands-free cell phone, driving performance was significantly compromised. "Cell phone and passenger conversation differ in their impact on a driver's performance; these differences are apparent at the operational, tactical, and strategic levels of performance," the researchers wrote.

The study, led by Frank Drews, PhD, of the University of Utah, analyzed the driving performance of 41 mostly young adult drivers paired with 41 friends who served as conversation partners. Both sexes were equally represented.

In each of three experimental conditions (conversation with hands-free cell phone, conversation in the car, or no conversation), one person in each pair was randomly selected to be the "driver" and the other the conversation partner.

Drivers used a sophisticated simulator that presented a 24-mile multilane highway with on- and off-ramps, overpasses and two-lane traffic in each direction. Participants drove under an irregular-flow condition that mimics real highway conditions -- with other vehicles, in compliance with traffic laws, changing lanes and speeds. This context required "drivers" to pay attention to surrounding traffic.

In the cell-phone conversation condition, drivers' conversation partners were at another location. In the in-car conversation condition, partners sat next to their (simulated) drivers. In both cases, conversation partners were told to tell one another a previously undisclosed "close call" story about a time their lives were threatened.

All drivers were instructed to leave the simulated highway once they arrived at a rest area about eight miles from the starting point. Partners were told the driver had this task. The driving sequences took about 10 minutes to finish.

Drivers talking by cell phone drove significantly worse than drivers talking to passengers. The cell-phone users were more likely to drift in their lane, kept a greater distance between their car and the car in front, and were four times more likely to miss pulling off the highway at the rest area. Passenger conversation barely affected all three measures.

The authors said the problems could have stemmed from inattention "blindness," or insufficient processing of information from the driving environment. Cell-phone users may also have found it harder to hold in working memory the intent to exit at the rest area.

Conversation analyses revealed some interesting patterns, according to the researchers. When driving tasks got more complicated, drivers appeared to modulate the complexity of their speech, as measured by syllables-per-word. Drivers also talked more when using cell phones, perhaps, the authors speculated, because they were trying to control the conversation to avoid using the mental resources required to really listen to the other person.

Meanwhile, passengers took an active role in supporting the driver, often talking about surrounding traffic. That shared situational awareness could be helpful to the driver.

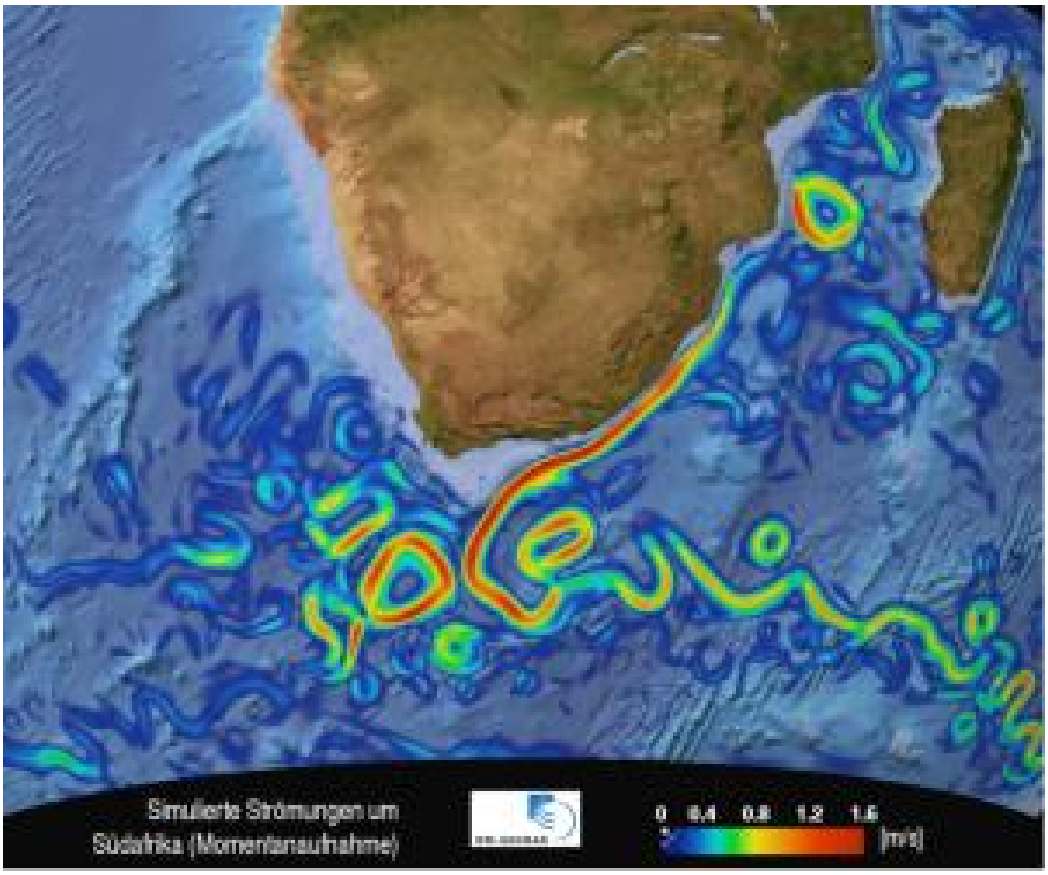
Journal reference:

1. Frank A. Drews, PhD, Monisha Pasupathi, PhD, and David L. Strayer, PhD. **Passenger and Cell Phone Conversations in Simulated Driving**. *Journal of Experimental Psychology: Applied*, Vol. 14, No. 4

Adapted from materials provided by American Psychological Association.

http://www.sciencedaily.com/releases/2008/12/081201081917.htm

Ocean Currents Off South Africa Influence Gulf Stream



Currents around South Africa (snapshot). The Agulhas Current (red band) flows along the South African coast. South-west of Cape Town it abruptly turns back into the Indian Ocean. In this process huge rings of water are cut off that flow westward into the Atlantic Ocean. (The colours indicate the strength of the currents.) (Credit: Image courtesy of Leibniz Institute of Marine Sciences)

ScienceDaily (Dec. 1, 2008) — Variations in the strength of the Gulf Stream can in part attributed to currents off South Africa. Oceanographers at the Leibniz Institute of Marine Sciences (IFM-GEOMAR), Kiel and the University of Cape Town developed a computer model to study the currents systems in unsurpassed detail. To their surprise, they found the impact of small-scale fluctuations of the Agulhas Current south of Africa is detectable all the way into the North Atlantic Ocean.

The Agulhas Current is, like the Gulf Stream, one of the strongest currents in the world ocean. It carries warm and salty water from the tropical Indian Ocean along South Africa's east coast. South-west of Cape Town it makes an abrupt turn back into the Indian Ocean. In this process huge rings of water with diameters of hundreds of kilometre are cut off at intervals of 3 to 4 months. These so-called "Agulhas Rings" carry extra heat and salt into the South Atlantic, making this a key region for the whole Atlantic Ocean.

"Even when it might seem strange for oceanographers in far-away from Germany to investigate currents near South Africa" says Dr Arne Biastoch of the IFM-GEOMAR in Kiel, first author of the research papers. "Surprisingly, one can follow the influence of the Agulhas Current right up to the North Atlantic Ocean. This has important consequences for observational programmes in the North Atlantic that attempt to determine the much feared long-term, climatic changes in the Gulf Stream system."

The new studies show that normal changes from year to year in the formation of Agulhas Rings lead within a few years to an increase in the flux of warm water across the equator from the South to the North Atlantic Ocean. This far-reaching influence was not known before.

"Studies of this kind can only be carried out using very large computer models, which have to simulate fine details in the ocean currents“, adds Prof. Claus Böning from IFM-GEOMAR.

In close international collaboration with colleagues of France and South Africa a new, high-resolution ocean model was developed and intensively tested. It calculates the evolution of the currents on a fine mesh of approximately 40 million grid points. For the simulation supercomputers at the University of Kiel and in Stuttgart were used for a period of over 6 months. The analysis of the enormous amounts of data will keep the scientists of Kiel and their international colleagues busy for years.

This research was recently published both in Nature and Geophysical Research Letter.

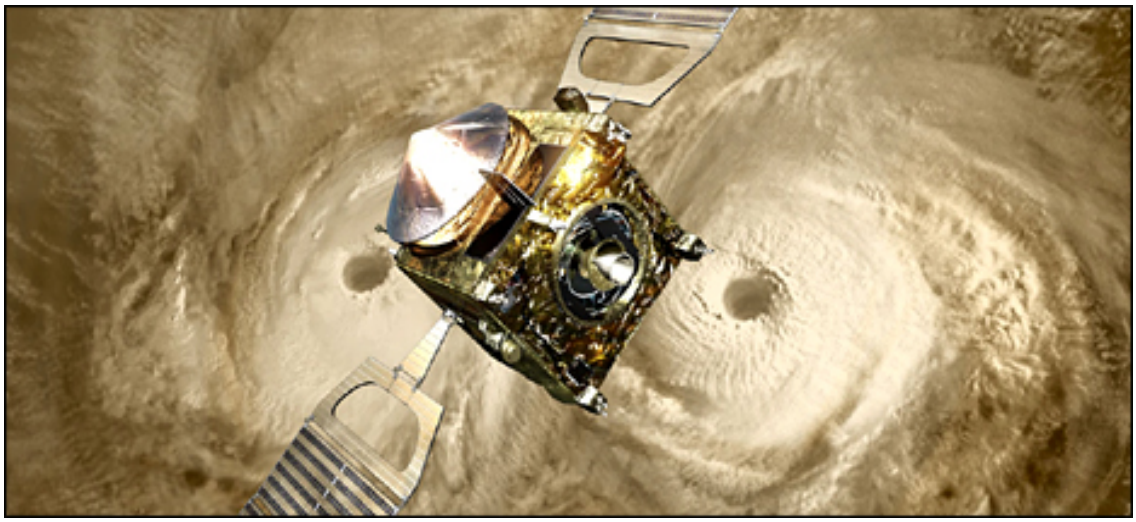
Adapted from materials provided by Leibniz Institute of Marine Sciences, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081126133539.htm

Venus ultraviolet puzzle 'solved'

By Paul Rincon
Science Reporter, BBC News

One of the many mysteries of Earth's nearest planetary neighbour Venus has been cracked, Nature journal reports.



Scientists have long puzzled over conspicuous patches in the Venusian clouds that appear dark at ultraviolet (UV) light wavelengths.

They now think these are solid particles or liquid droplets that get transported from deep in the atmosphere up to the planet's cloud tops.

But a riddle remains: scientists still don't know what they are made up of.

The features are distributed within the thick clouds of sulphuric acid and sulphur dioxide that shroud the hothouse planet.

"These (UV features) have been observed since 1929. We see them in images from the Pioneer Venus probe and in ground-based observations," said Dr Dmitri Titov, from the Max Planck Institute for Solar System Research in Germany.

It had previously been unclear whether these were caused by differences in the height of the cloud tops, temperature differences or variation in composition of the clouds.

Darkness and light

Data from the European Space Agency (Esa) spacecraft show that areas near Venus' equator which appear dark in ultraviolet light are regions of relatively high temperature.

The scientists think this is where intense convection brings up the mysterious dark material from below.

Bright regions at Venus' mid-latitudes are areas where the temperature in the atmosphere decreases with depth, which prevents air from rising. The effect is most extreme in a wide belt around the poles, which has been dubbed the "cold collar". At low and mid-latitudes, the cloud top is located at a constant altitude of about 72km in both the dark and light regions, which suggests the light and dark patches do not result from changes in elevation. Instead, the most likely cause is the uneven distribution of a mysterious chemical in the atmosphere that absorbs ultraviolet light, creating bright and dark zones.

Although the exact chemical species that creates the high-contrast zones remains elusive, a complex compound of sulphur is now a favourite. But a full answer may have to wait for a subsequent Venus mission.

"It seems that Venus Express will not completely solve this," Dr Titov told BBC News. "This species is very strange because it doesn't have particular features - just very broad ones. So we can't say exactly what it is made of. It's probably some kind of chemical hidden inside cloud droplets."

He added: "We need to send balloons (to Venus). The balloons will be ideal because they will be flying in this region. And if we have a chemical laboratory... on board the balloon we will really understand what this is."

Sun block

Balloons were deployed in the Venusian atmosphere during the Soviet-French Vega 1 mission in 1985. And both the US and Europe have carried out technical studies on a next-generation Venus mission which could feature a balloon or lander. Some researchers have even speculated whether Venusian microbes could survive high in the planet's atmosphere, where the temperature and pressure are quite Earth-like.

Here, they say, the ultraviolet-absorbing chemical could act as an "umbrella" to shield life forms from the destructive UV rays coming from the Sun. Further down, conditions are quite different. The planet's surface is heated to an average temperature of 467C (872F) - hot enough to melt lead.

And the dense atmosphere generates a surface pressure 90 times greater than that on Earth. Another key question for the mission is whether Venus is still volcanically active. Venus Express has found a highly variable quantity of the volcanic gas sulphur dioxide in the atmosphere.

Some observers think this could be to do with recent volcanic activity on the surface.

But others say the lack of rain on Venus to scrub the atmosphere clean of sulphur dioxide means Venus Express could be detecting events that happened millions of years ago.

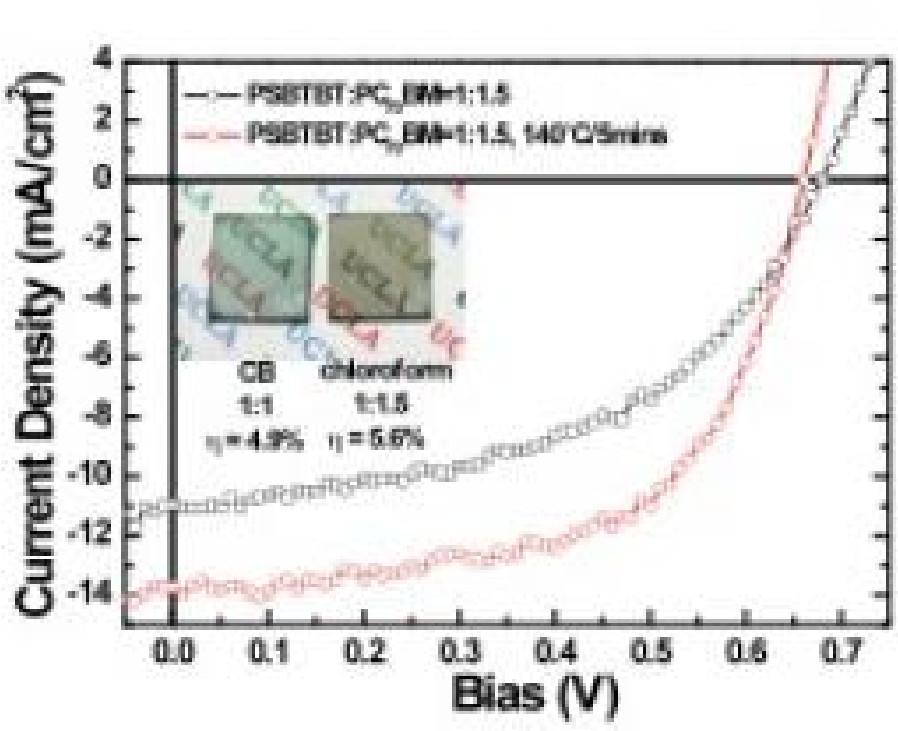
"We're not ready to say definitively one way or another on the basis of this evidence before we analyse all the data," said Fred Taylor, Venus Express interdisciplinary scientist at the University of Oxford.

He told the Oxford Science Blog: "However, there's plenty of indirect evidence for volcanic activity on Venus so, in my opinion, it's about how much activity is going on and the role it plays in the planet's climate. I think it's probably just a matter of time before we 'see' a volcano erupting."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7763009.stm

Published: 2008/12/03 21:01:24 GMT

Polymer Solar Cells With Higher Efficiency Levels Created



UCLA solar polymer films and the corresponding device characteristics made from these films. The films are actually semitransparent. (Credit: Image courtesy of UCLA)

ScienceDaily (Dec. 1, 2008) — Currently, solar cells are difficult to handle, expensive to purchase and complicated to install. The hope is that consumers will one day be able to buy solar cells from their local hardware store and simply hang them like posters on a wall.

A new study by researchers at the UCLA Henry Samueli School of Engineering and Applied Science has shown that the dream is one step closer to reality. Reporting in the Nov. 26 edition of the Journal of the American Chemical Society, Yang Yang, a professor of materials science and engineering, and colleagues describe the design and synthesis of a new polymer, or plastic, for use in solar cells that has significantly greater sunlight absorption and conversion capabilities than previous polymers.

The research team found that substituting a silicon atom for carbon atom in the backbone of the polymer markedly improved the material's photovoltaic properties. This silole-containing polymer can also be crystalline, giving it great potential as an ingredient for high-efficiency solar cells.

"With the reality of today's energy crisis, a new-game changing technology is required to make solar cells more popular," Yang said. "We hope that our newly synthesized polymer can eventually be used on solar cells far beyond their current rooftop applications. Imagine a house or car covered and powered by flexible solar films. Our dream is to see solar cells used everywhere."

Polymers are lightweight, low-cost plastics used in packaging materials and inexpensive products like insulators, pipes, household products and toys. Polymer solar cells utilize organic compounds to produce

electricity from sunlight. They are much cheaper to produce than traditional silicon-based solar cells and are also environmentally friendly.

But while polymer solar cells have been around for several years, their efficiency has, until recently, been low. The new polymer created by Yang's team reached 5.1 percent efficiency in the published study but has in a few months improved to 5.6 percent in the lab. Yang and his team have proven that the photovoltaic material they use on their solar cells is one of the most efficient based on a single-layer, low-band-gap polymer.

At a lower band gap, the polymer solar cell can better utilize the solar spectrum, thereby absorbing more sunlight. At a higher band gap, light is not easily absorbed and can be wasted.

"Previously, the synthesizing process for the polymer was very complicated. We've been able to simplify the process and make it much easier to mass produce," said Jianhui Hou, UCLA postdoctoral researcher and co-author of the study. "Though this is a milestone achievement, we will continue to work on improving the materials. Ideally we'd like to push the performance of the solar cell to higher than 10 percent efficiency. We know the potential is there."

"We hope that solar cells will one day be as thin as paper and can be attached to the surface of your choice," added co-author Hsiang-Yu Chen, a UCLA graduate student in engineering. "We'll also be able to create different colors to match different applications."

The study was funded by Solarmer Energy Inc. and a UC Discovery Grant. Solarmer Energy Inc. has recently licensed the technology from UCLA for commercialization.

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

http://www.sciencedaily.com/releases/2008/11/081126133435.htm

Why Are So Many Infectious Diseases Jumping From Animals To Humans?

Community member Peter Atwooki (left) and Tom Gillespie talk about the interface between conservation and health at a community meeting in Kanyawara, Uganda. (Credit: Image courtesy of Emory University)

ScienceDaily (Dec. 1, 2008) — Why are so many infectious diseases jumping from animals to humans? Why do we have so little capacity to predict epidemics, or avoid them? Some answers, and possible solutions, can be found in the first trench-to-bench guide to wild primate infectious diseases, to be published Nov. 17 in the Yearbook of Physical Anthropology.

"There is growing awareness that the majority of emerging pathogens in the world are coming from wildlife. And most of that wildlife is in tropical forests – in places where we have the least disease surveillance," says Thomas Gillespie, assistant professor of environmental studies at Emory University, and lead author of the article.

In addition to describing integrative approaches to studying primate infectious diseases, the article provides standardized, step-by-step guidelines for properly gathering and storing feces, blood and other specimens from wild primates for laboratory analysis.

"By giving researchers from a range of disciplines standardized guidelines for collecting data, and integrating that data across sites, we can build a baseline for patterns of primate disease. That may give us a chance to see something abnormal before it becomes an epidemic," says Gillespie, one of the world's leading primate disease ecologists.

The article was in response to a growing outcry among scientists for integrated approaches to studying how outbreaks get their start. A meta-analysis published in the journal "Nature" in February showed that

more than 60 percent of epidemics between 1940 and 2004 began when a germ jumped from wildlife to humans.

Gillespie's co-authors on the Yearbook of Physical Anthropology article were Charles Nunn, a biological anthropologist at Harvard University; and Fabian Leendertz a virologist at the Robert Koch Institute and Max Planck Institute for Evolutionary Anthropology in Germany.

Risk of Primate, Human Pathogen Exchanges Up

The specialized field of primate disease ecology began around 1999, when the global HIV/AIDS pandemic was traced definitively to SIV-1 from chimpanzees. While HIV/AIDS and Ebola are the two most dramatic examples of human diseases linked to primates, many other viral, bacterial, fungal and parasitic pathogens found in apes and monkeys are readily transmissible to humans. Recent studies have also shown that potential pathogens are passing from people and domestic animals to primates, bolstering suspicions that primate epidemics of polio, measles and respiratory diseases came from humans.

"The close genetic relationship between wild primates and people, coupled with growing human activity in forests, is increasing the opportunities for the exchange of pathogens," Gillespie says.

One of Gillespie's current research projects, funded by the National Geographic Society, is tracking the ecology of pathogens among people and wild primates at logging sites in the Republic of Congo. The project is gathering data to support sustainable logging methods, as well as to protect the health of people and animals.

Integrated Research Key to Interventions

Gillespie is among the founding scientists of the Great Ape Health Monitoring Unit, a cooperative effort of the United Nations, academic institutions and non-governmental organizations. The unit strives to integrate research from anthropologists, health professionals, biologists, ecologists and other scientists who are studying wild primates in remote locales with the work of lab-based scientists and computer modelers.

"We want to reduce the risks of a pathogen jumping from animals to people and vice-versa," Gillespie says. "And if a pathogen does make the jump, we want to have enough data to develop effective interventions."

Adapted from materials provided by Emory University.

http://www.sciencedaily.com/releases/2008/11/081118141710.htm

Humanity May Hold Key For Next Earth Evolution

Charles Langmuir described planetary evolution as a series of steps. (Credit: Kris Snibbe/Harvard News Office)

ScienceDaily (Dec. 1, 2008) — Human degradation of the environment has the potential to stall an ongoing process of planetary evolution, and even rewind the evolutionary clock to leave the planet habitable only by the bacteria that dominated billions of years of Earth's history, Harvard geochemist Charles Langmuir said Thursday (Nov. 13).

Langmuir, Higgins Professor of Geochemistry and an expert on the undersea volcanic vents that are contenders for life's birthplace, said that planets may proceed through a natural series of evolutionary steps that transform them from lifeless balls into the home of bacteria and other microscopic life and then into a place that supports more complex life.

Along the way, life interacts with the nonliving parts of the planet in planet-changing ways. The oxygen in today's atmosphere, for example, was initially given off by early bacteria that changed the air's chemical composition over billions of years.

Langmuir described this planetary evolution as a series of steps and said there's no guarantee that a planet will proceed from one to the next. Each step represents a moment of both crisis and opportunity. So far, the Earth has surmounted each step, while other planets, such as Mars, which may have once had microscopic life, failed to cross the evolutionary hurdle where life is sustained and becomes abundant.

"It seems likely that all planets go through stages, but some get stuck and stop," Langmuir said. "Life, I think, is a natural planetary process, likely to occur on any planet with the proper climate systems."

The Earth today may be at the brink of another step, Langmuir said. Complex life has evolved into intelligent life that dominates the planet — ecosystems, food webs, and energy flow — as no species ever has before.

Whether the planet takes the next step or not may depend on us. If we recognize humanity is an integral part of the planet and begin working for a healthy Earth, then planetary evolution could move forward to some unknown future.

On the other hand, Langmuir said, if we continue to view the Earth as something that is separate, that we merely use, then the resulting practices could damage the environment enough to stall planetary evolution, even causing it to fall back to a level where it supports just microscopic life.

“The story of the Earth is our story. We are intimately connected [to the Earth] in every fiber of our being, in every breath we take. We’re inseparable from the Earth,” Langmuir said.

Langmuir spoke to an audience of several hundred at the Geological Lecture Hall in the first talk of the Harvard Museum of Natural History’s “Earth Matters” series. Langmuir’s talk, “Earth and Human: A Planetary Perspective,” sought to look at humanity and human impacts on the Earth from the long viewpoint of the planet.

Langmuir developed his views as he explored the Earth’s ocean basins, where volcanoes along the mid-ocean ridges constantly renew the continental plates. It was while in research vessels’ close quarters with scientists from other disciplines who were exploring the living communities clustered around these vents that Langmuir came to appreciate how deeply intertwined living and geological systems are.

“Here we see an entirely different living environment from other life on Earth, based on the planet itself. It has completely changed our view of life on Earth. We see that volcanoes and life are related to each other; Earth and life are related,” Langmuir said.

Through the course of the talk, Langmuir brought audience members on a tour of Earth’s history.

The early Earth would have looked a lot like the moon, pockmarked and bombarded by meteors, with very active volcanoes, no protective ozone layer, high carbon dioxide, and very likely high temperatures. The early atmosphere, he said, had no oxygen at all, so early bacteria developed ways to live without it. When those bacteria figured out how to harness the sun’s energy through photosynthesis — which Langmuir termed Earth’s first energy revolution — oxygen was a byproduct. Released in tiny amounts by untold numbers of bacteria over billions of years, oxygen levels gradually built up in the atmosphere. That not only changed the atmosphere, Langmuir said, it also changed the rocks, as oxygen is very reactive and interacts readily with iron and other elements in the rocks.

To those early anaerobic bacteria, oxygen wasn’t a boon; it was a poison. Because oxygen is so reactive, it was toxic to those microscopic creatures. That is why, Langmuir said, chemicals such as antioxidants developed, to protect against oxygen’s damaging effects. As oxygen levels rose, however, some creatures learned to use it in a way that provided an enormous boost to their metabolism compared with that of oxygen-free processes. Langmuir described the incorporation of oxygen into metabolism as the planet’s second energy revolution.

More complex single-celled creatures, the eukaryotes, joined bacteria in the Earth’s microscopic menagerie, eventually teaming up to form multi-celled creatures. Eventually, enough oxygen built up that ozone was formed high in the atmosphere, shielding the land from harmful radiation, and allowing life to emerge from the seas.

From there, large animals emerged, then mammals, and finally, humans.

All the while, Langmuir said, physical systems supported and were influenced by living systems, with chemicals cycling into and out of the Earth to maintain the chemical balance of the seas and the air. The

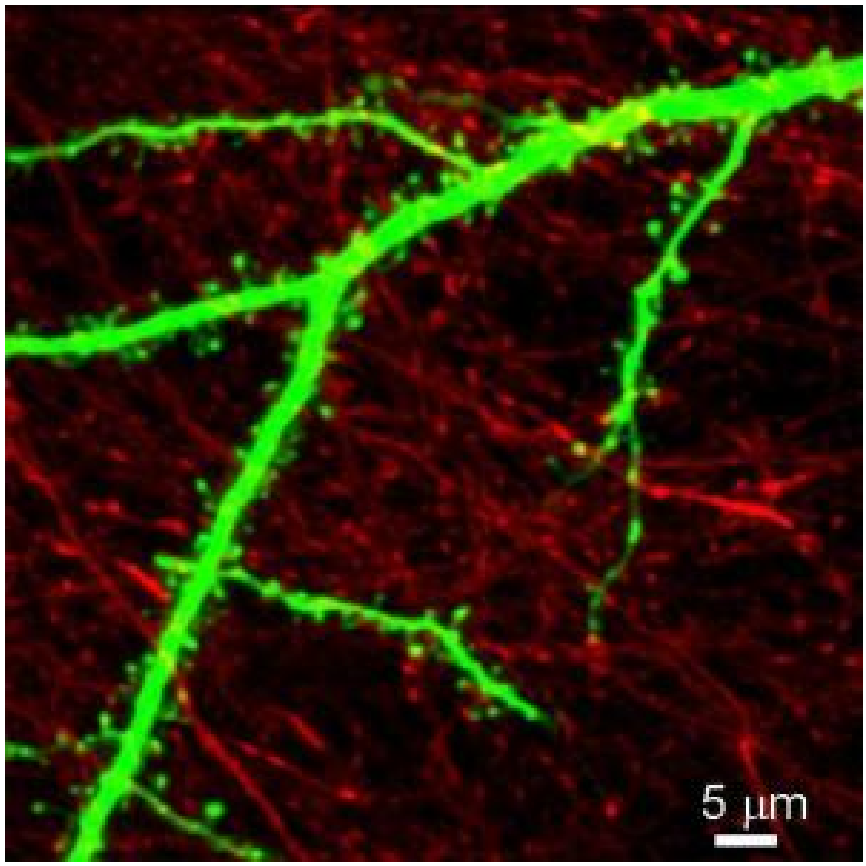
end result, Langmuir said, is that we humans are creatures that are very much a part of the Earth and will remain dependent on it for our future.

"We are … an agent for planetary evolution or an agent for planetary destruction," Langmuir said. "Do we relate to the current environmental problems as if we are users of the Earth, or do we recognize that we are the byproduct of 4.5 billion years of planetary evolution? What we do may determine whether the planet is able to move into its next phase of development."

Adapted from materials provided by Harvard University.

http://www.sciencedaily.com/releases/2008/11/081129173302.htm

Why We Remember Important Things And Forget Trivia: Neuron's Synapses Remodel Themselves



Only when the transmission terminals (on the red cells) and the receiver stations (on the green cells) are in the right proportion to each other can communication actually take place in the brain. (Credit: Max Planck Institute of Neurobiology / Nägerl)

ScienceDaily (Dec. 3, 2008) — Where would we be without our ability to remember important information or, for that matter, to forget irrelevant details? Thanks to the flexibility of the nerve cell's communication units, called synapses, we are good at both. Up to now, only the receiving side of a synapse was believed to play an active role in this reorganization of the brain, which is thought to underlie our ability to learn but also to forget.

An incorrect assumption, as scientists at the Max Planck Institute of Neurobiology in Martinsried could now show. In the scientific journal Neuron, they report that the neurotransmitter-releasing part of a synapse dramatically remodels itself in response to electrical stimulation. It may thus make a decisive contribution to the adaptability of the brain to ever-changing environments.

Communication is the be-all and end-all of the brain. Every one of the hundred billion nerve cells that comprise our brain is a master of data exchange, with contacts to thousands of neighbouring cells. At these points of contact, known as synapses, the neuronal information flows along a one-way channel; from the upstream cell to the downstream cell. The brain can deal with its complicated tasks only when the nerve cells manage to exchange information at the right time and place via their synapses.

It therefore comes as no surprise that one of the most outstanding attributes of the brain is its great adaptability. This is due to the versatility of the synapses, which, depending on whether they are required

or not, can proliferate or are pruned accordingly. Most scientists are of the opinion that this flexible exchange of information is what makes learning and memory possible in the first place.

The two sides of information transmission

The receiver side of the points of contact, the spines, plays an active role in the assembly and break-down of new synapses. The more information to be processed, the more receiver stations the nerve cell will set up. New spines grow towards neighbouring cells to form new synapses. If the flow of information weakens, the synapses disappear and the spines can regress. By comparison, the other side of the synapse, the transmitter unit, also known as bouton, was believed to play only a passive role in the formation of synapses.

However, this presumption turned out to be false, as scientists at the Max Planck Institute of Neurobiology have now shown. They are the first to successfully observe both the receiver side and the transmitter terminal of a synapse over an extended period of time. This involved tagging a number of nerve cells with a red fluorescent dye and labelling the connected cells in green. Using a high-resolution two-photon microscope, changes on both sides could be observed in time-lapse sequences.

It soon became clear that the transmitter unit of a synapse played a considerably more active role in the assembly and disintegration of the synapse than hitherto assumed. Once the flow of information to be passed on by a cell is reduced, many of the meanwhile superfluous transmitter stations are broken down. Furthermore, since this novel experimental approach enabled them to watch the contacts between boutons and spines breaking down directly under the microscope, the scientists were able to verify that the reduction in the number of spines does, in fact, result in the loss of synapses.

The brain's reorganization is unexpectedly complex

"What is particularly exciting is that, all in all, the number of transmitter terminals remains constant", project leader Valentin Nägerl explains. While the number of synapses is reduced when the flow of information weakens, new transmitter terminals emerge elsewhere in a seemingly balanced fashion. Since only those cells that originally communicated with each other were tagged, the scientists do not know whether the new transmitters pass the information on to nerve cells that were hitherto not involved in the communication. "Perhaps the cells form new synapses to inhibitory nerve cells, which would reduce the transmission of synaptic information even more", Nadine Becker speculates on her results. The scientists now aim to investigate precisely this possibility by also visualizing synapses formed with inhibitory neurons. One thing is for certain: The processing of information is not exclusive to the receiver cell. The transmitter cell reacts actively to the situation at hand and therefore plays an important role in our ability to learn and remember things.

Journal reference:

1. Nadine Becker, Corette Wierenga, Rosalina Fonseca, Tobias Bonhoeffer, U. Valentin Nägerl. **LTD induction causes morphological changes in presynaptic boutons and reduces their contacts with spines**. *Neuron*, November 26, 2008

Adapted from materials provided by Max-Planck-Gesellschaft.

http://www.sciencedaily.com/releases/2008/12/081202115201.htm

Vaccine Against Multiple Sclerosis? Mouse Experiment Yields Promising Results

ScienceDaily (Dec. 3, 2008) — Some 80,000 people in Germany suffer from multiple sclerosis – their immune system attacks and destroys healthy nerve tissue. Researchers at the Heidelberg University Hospital and the German Cancer Research Center in Heidelberg have succeeded in vaccinating mice with specially treated, autologous immune cells and preventing them from developing encephalitis, which is similar to multiple sclerosis in humans.A protein of the nervous system, that is the target of the harmful immune reaction in multiple sclerosis, was placed on the surface of the cells; the cells were treated with an agent that suppresses immune defense.

The Heidelberg researchers have published their results, initially online, in the Proceedings of the National Academy of Sciences USA.The team around Professor Dr. Peter Terness is working in the Department of Transplantation Immunology (Director: Professor Dr. Gerhard Opelz) of the Institute of Immunology at the Heidelberg University Hospital. Professor Terness and his colleagues work primarily on developing methods to prevent rejection of donor organs without impairing the immune system.

Vaccine developed from transplant research

"The vaccine against multiple sclerosis works on the same principle," explains Professor Terness. "We have to teach the immune system not to fight the donor organ, or in this case its own nerve cells, as a foreign body."In the course of their research on organ rejection, the scientists successfully treated immune cells (known as dendritic cells) of a donor animal with the chemotherapeutic agent mitomycin and injected them into the organ recipient before transplantation – the modified cells were not attacked. The immune system of the transplant recipient subsequently accepted the tissue of the donor animal as well. The results were published in "Transplantation" in 2007.

Treated cells suppress the immune response

Subsequently, Professor Terness's team used this procedure to suppress the harmful immune response in multiple sclerosis – in cooperation with Dr. Thilo Oelert from the Department of Molecular Immunology at the German Cancer Research Center they loaded immune cells from mice with a self protein from the nervous system, treated them with mitomycin, and reinjected them into the animals. Afterwards, experimental autoimmune encephalitis – the equivalent of multiple sclerosis in humans – could no longer be induced in these mice; they were resistant. "The treated cells express the target protein and simultaneously suppress the immune response. In this manner, the immune cells become accustomed to the protein and do not attack it later, even without the inhibitor," explains Professor Terness.

The researchers now want to study whether this method is also effective for treating already-existing multiple sclerosis. They will use animal experiments to study whether the vaccine with treated autologous cells has not only a preventive effect, but a therapeutic effect as well.

Journal reference:

1. Peter Terness, Thilo Oelert, Sandra Ehser, Jing Jing Chuang, Imad Lahdou, Christian Kleist, Florian Velten, Günter J. Hämmerling, Bernd Arnold and Gerhard Opelz. **Mitomycin C-treated dendritic cells inactivate autoreactive T cells: Toward the development of a tolerogenic vaccine in autoimmune diseases**. *Proc Natl Acad Sci USA*, 2008; DOI: 10.1073/pnas.0807185105

Adapted from materials provided by University Hospital Heidelberg.

http://www.sciencedaily.com/releases/2008/12/081201105851.htm

Bone Mineral Content Shown In Various Anatomical Areas, Confirms Differences In Gender And Age

Patterns of bone loss. (Credit: Unidad de Reumatología del Hospital Vall d'Hebron)

ScienceDaily (Dec. 3, 2008) — Scientists from the University of Alcalá de Henares (UAH) have examined the patterns of total bone mineral content of the Spanish population in different areas of the body. The analysis is the first one of its kind undertaken in Spain that studies subjects from birth until 80 years of age and confirms the differences in mineral content according to gender and changes due to age.

A team of Spanish researchers set out to establish the reference values for skeletal bone status in the course of a human being's lifetime. This is a "very important piece of work given the changes in bone metabolism of the Spanish population", Soledad Aguado, the main author of the work and researcher at the UAH explains to SINC.

The research, published in the latest number of the Skeletal Radiology Journal, is the first that has been undertaken in Spain in subjects whose ages ranged from 0 to 80 years of age. The study was performed in 1,120 subjects from the Community of Madrid, all of whom had a sedentary lifestyle.

The sample was divided into 16 groups at 5-year age intervals. Each group had a bone densitometry scan using the technique known as "Dual X-Ray phototonic absorptiometry [DXA]. The aim was to quantify bone mineral content in the whole body and in different and separate areas of the body. The results show that there are big differences in gender in the mean values of bone mineral content for the head and trunk of the body (between 16 and 25 years) and legs and arms (between 16 and 70 years). In all cases, women have less bone mineral content.

Previous studies confirmed that the bone mineral content increases from birth until 25 years of age and reduces from 26 until 40 years of age, the time at which it starts to stabilize. From 56 years old the reduction in bone mineral content becomes more acute. However, women reach their maximum bone mass at an earlier age than men: the increase of total bone mineral content occurs from birth until 20 years of age. The researcher from Madrid explains that these values "offer a useful piece of reference information when comparing them with sedentary populations from other geographical areas, or a population with osteoporosis or sportsmen or women".

Osteoporosis in Spain

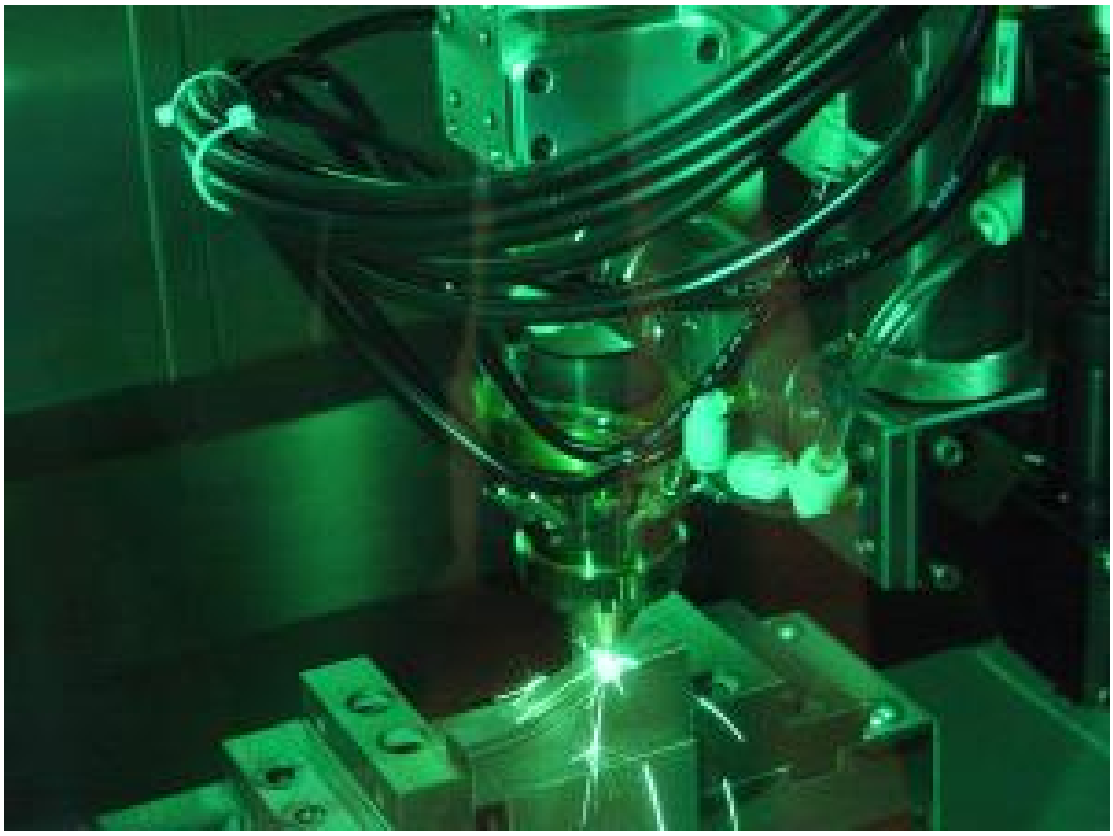
According to the Spanish Society for Bone Research and Mineral Metabolism [la Sociedad Española de Investigación Ósea y Metabolismo Mineral] (SEIOMM), osteoporosis is a disease that affects women more than men. Today two million women already suffer from this disease and it causes about 25,000 bone fractures per year as a result of deterioration in the micro-architecture of bone tissue caused by osteoporosis.

The appearance of this disease is caused mainly by an ageing population and the prevalence of this disease is increasing on a daily basis. Currently, osteoporosis affects 16% of people older than 50 years of age.

Adapted from materials provided by University of Alcalá de Henares, via AlphaGalileo

http://www.sciencedaily.com/releases/2008/12/081201145114.htm

Laser Deposition Welding And Milling In A Single Machine



The combination of laser cladding and milling manufactures complex molds and metallic components directly from the 3-D- CAD model. (Credit: Copyright Fraunhofer IWS)

ScienceDaily (Dec. 3, 2008) — Improving the productivity of machining processes is one of the basic requirements in every machine-tool engineering specification. The Fraunhofer Institute for Material and Beam Technology IWS in Dresden has integrated a laser module into the tool station of a milling spindle.

The five-axis, computer-controlled milling center can now perform two jobs: Three-dimensional deposition welding using a 1.5-kilowatt diode laser and component finishing using 5-axis milling. The IWS's manufacturing experts will be exhibiting their two-in-one machining solution on the joint Fraunhofer stand at the EUROMOLD trade show in Frankfurt from December 3 to 6, 2008 (Hall 8, Stand L113).

»We linked all the processing steps on the basis of uniform CAD and NC data, and implemented them in a single machine with one tool fixture,« relates Dr.-Ing. Steffen Nowotny of the IWS in Dresden. The 5-axis CNC milling center is ideal for performing repairs on mold inserts used to manufacture plastic components, and for machining finely structured surfaces and functional coatings on metallic components. Instead of having to discard damaged precision tools, they can now be returned to the workshop, reprocessed by the laser welding and milling machine, and reused – thus saving costs and reducing expenditure on new tools.

The combination of laser cladding and milling is also a cost-effective method of manufacturing complex molds and metallic components directly from the 3-D CAD model. The machining system's high degree of automation and its multitasking capability are extremely useful attributes in applications such as aircraft engine maintenance and automobile construction: »The software links together all the individual processes. This simplifies and speeds up the task of programming the machine,« says Nowotny.

The use of a complete machining solution significantly improves process efficiency, because the numerical control system regards the laser tool head and the milling spindle as interchangeable tools. The ability to switch rapidly and easily between milling and laser welding provides added flexibility, resulting in a machine that offers all the necessary features for time-saving manufacturing processes.

Adapted from materials provided by Fraunhofer-Gesellschaft.

http://www.sciencedaily.com/releases/2008/12/081201110003.htm

New Online Test For Depression

ScienceDaily (Dec. 3, 2008) — A new universal test to predict the risk of someone succumbing to major depression has been developed by UCL (University College London) researchers. The online tool, predictD, could eventually be used by family doctors and local clinics to identify those at risk of depression for whom prevention might be most useful.

The risk algorithm, developed by a team led by UCL Professors Michael King and Irwin Nazareth, was tested in 6,000 people visiting their family doctor in six countries in Europe (UK, Spain, Portugal, the Netherlands, Slovenia and Estonia). Its accuracy was also tested in nearly 3,000 GP attendees in a further country, Chile, in South America. The study, published in the Archives of General Psychiatry, followed-up the participants at six and 12 months. The team modelled their approach on risk indices for heart disease, which provide a percentage risk estimate over a given time period. The algorithm was as accurate at predicting future episodes of depression as similar instruments developed in Europe to predict future risk of heart problems.

Further testing of the tool as an early detector of depression is planned in randomised trials of prevention in Europe. The team are also exploring the feasibility of using the instrument in China, with plans to set up a study on the prediction of depression in a Chinese community setting. This would be the first ever research initiative of its kind within Asia.Professor Michael King, UCL Department of Mental Health Sciences, says: “Depression is a common problem throughout the world, but although we know how to treat it, we know very little about how to prevent its onset. We have ways of predicting the onset of heart disease or stroke, but none for predicting people’s risk of major depression. Our study is one of the first to develop a risk algorithm for just this purpose.”

“Risk tools such as ours are needed to focus more effort on preventing depression. For example, people identified as at risk by an online tool could be flagged on a GP’s computer. Recognition of those at risk could help with watchful waiting or active support, such as restarting treatment in patients with a history of depression. Patients could also be advised on the nature of depression or on cognitive behaviour therapies to help reduce their risk of developing major depression.”“Major depression is now a leading cause of illness and disability world-wide and reducing its prevalence is one of the greatest public health challenges of the twenty-first century. Depression will rank second to cardiovascular disease as a global cause of disability by 2020. Up to a quarter of people who visit their doctor experience major depression, with relapses frequently occurring for up to 10 years.”

“The next stage of our research will be to establish how GPs could use our tool to help prevent the onset of depression. We are hoping to run a large-scale trial to explore the tool’s use in prevention.”This study was funded by the European Commission.

A website has been set up for the risk algorithm, at http://www.ucl.ac.uk/predict-depression/.

Journal reference:

1. Michael King et al. **Development and validation of an international risk prediction algorithm for episodes of major depression in general practice attendees**. *Archives of General Psychiatry*, December 2008

Adapted from materials provided by University College London.

http://www.sciencedaily.com/releases/2008/12/081202115154.htm

Epigenetics: Plants Display 'Molecular Amnesia'

The researchers' experiments with corn -- technically known as "maize" -- suggest the propensity to maintain epigenetic states can vary depending on the position of the transposons within the genome. (Credit: iStockphoto/Bill Grove)

ScienceDaily (Dec. 3, 2008) — Plant researchers from McGill University and the University of California, Berkeley, have announced a major breakthrough in a developmental process called epigenetics. They have demonstrated for the first time the reversal of what is called epigenetic silencing in plants.

The findings are important to develop a better understanding of gene regulation in the continuing quest to breed enhanced crops that produce higher yields, are more resistant to disease and can better tolerate environmental stress – all keys to helping improve the world's food supply. But perhaps even more important, the discovery may lead to new insights into how epigenetic processes work in the human body, which could assist in developing new ways of modifying our genetic makeup to help us avoid such diseases as cancer.

Although nearly every cell in our body is genetically identical, the researchers explained, each cell type expresses a distinct set of genes. Changes to the proteins around which DNA is wound are called "epigenetic" modifications, because they alter patterns of this gene expression without changing the actual DNA sequence. However, like changes in DNA sequence, epigenetic modifications can be passed on from parent cell to daughter cell, ensuring each cell line has the proper characteristics consistently over many generations.

This process must be repeated each generation, and there is good evidence in animals that, during early development, there is a wave of epigenetic reprogramming that effectively "resets" this system. Some genes, it seems, must be more actively reset than others. And genes that do the same thing in every cell, regardless of tissue type, may not have to be reset at all.

One kind of gene is quite distinct from all of the others, because it is nearly always epigenetically inactivated. These are the genes carried by transposons, or "jumping genes." Transposons are mutagens, genes that can modify their host cell in different ways, and lead to a predisposition to cancer, for example.

The researchers' experiments with corn – technically known as "maize" – suggest the propensity to maintain epigenetic states can vary depending on the position of the transposons within the genome.

Many organisms, from worms to humans to plants, have learned to tame transposons by epigentically "silencing" them: if they can't express their genes they can't jump. If they can't jump for long enough, their DNA sequence slowly accumulates errors, and they become molecular fossils. Most transposons in most organisms are silenced in this way, but some remain quite active.

In previous studies from the laboratory of two of the article's authors, UC Berkeley professors Damon Lisch and Michael Freeling, with the support of the National Science Foundation at UC Berkeley, epigenetic silencing was triggered in maize. Once triggered, the maize plant "remembers," and keeps the transposon "silenced" generation after generation, even after the trigger is lost.

"However, we have found that at some positions in the genome, this is not the case. At these positions, although the trigger works fine, and the transposon is silenced, once the trigger is lost, the transposon reawakens," said Jaswinder Singh, a professor in the Plant Sciences Department at McGill University, and lead author of the new article. The study, "A Position Effect on the Heritability of Epigenetic Silencing," was published in October in the journal PLoS Genetics.

This "molecular amnesia" has never before been documented in plants and no one has seen it associated with a particular position in the genome of any species before. These data suggest the epigenetic landscape of plant genomes may be more subtle and interesting than previously thought, with the ability to remember epigenetic silencing varying depending on position.

"This may relate to the degree to which a given gene or group of genes must be reprogrammed each generation," Singh said. "We can now use transposons to probe for variations in the epigenetic landscape of the maize genome. It may turn out that forgetting can be as important as remembering. Our findings suggest that erasure of heritable information may be an important component of epigenetic machinery."

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

http://www.sciencedaily.com/releases/2008/12/081202153529.htm

Putting A Green Cap On Garbage Dumps

Bulldozer dumping soil over layers of domestic garbage in a landfill site. Landfill sites produce the greenhouse gases, methane and carbon dioxide, as waste decays. Growing plants and trees on top of a landfill, a process known as 'Phytocapping', could reduce the production and release of these gases. (Credit: iStockphoto)

ScienceDaily (Dec. 3, 2008) — Landfill sites produce the greenhouse gases, methane and carbon dioxide, as putrescible waste decays. Growing plants and trees on top of a landfill, a process known as 'Phytocapping', could reduce the production and release of these gases, according to Australian scientists.

Despite legislative pressures to reduce landfill use, in certain parts of the world it remains the most economical and simplest method of waste disposal.

Biodegradation of organic matter in a landfill site occurs most rapidly when water comes into contact with the buried waste, explains Kartik Venkatraman and Nanjappa Ashwath of the Department of Molecular and Life Sciences, at Central Queensland University (CQU), Rockhampton, Australia. They point out that conventional approaches to reducing this effect involve placing compacted clay over the top of a landfill to form a cap that minimizes percolation of water into the landfill.

Some sites do not attempt to prevent water percolation and biodegradation and instead install gas collection systems to trap the methane released.

The use of clay capping has generally proved ineffective in trials in the USA, the researchers say. The problem being that in arid regions the clay cap dries out and cracks allowing water to easily percolate into the landfill. Equally problematic, methane gas collection is an inordinately expensive option for many Australian landfills that do not reach the methane production threshold to enable efficiency.

Hence, a new technique, known as phytocapping, which involves placing a layer of top soil and growing dense vegetation on top of a landfill, was successfully trailed at Rockhampton's Lakes Creek Landfill not far from Central Queensland University. This research was conducted by Kartik Venkatraman and Nanjappa Ashwath (CQU) in conjunction with the Rockhampton Regional Council and Phytolink Pty LTD.

Selected plant species are established on an unconsolidated soil placed over the waste. The soil acts both as "storage" and "sponge" and the plants as "bio-pumps" and "rainfall interceptors". For an effective site water balance, it is important that appropriate plant species are chosen and the soil depth optimized. As such, the team has investigated the effects of different ranges of species as well as soil depth.

The team's studies of the benefits of a landfill phytocap show that the approach can reduce surface methane emission four to five times more than the adjacent un-vegetated site. They found that a cap of 1400 mm thickness also reduces surface methane emissions 45% more than a cap half as thick.

The team also looked at the effects of nineteen tree species, including acacias, figs, eucalyptus, and other Australian native species, growing in the phytocap to determine which species are most effective at reducing water percolation and methane emissions. The root system acts as a good substrate to methanogens, which oxidizes methane thereby reducing methane emission into the atmosphere.

The benefits of phytocapping include, cutting in half the cost of landfill remediation and providing biodiversity corridors along which wild species can travel. The process also inverts the aesthetic qualities of landfills adjacent to urban communities, and in some cases, introduces economical benefits such as timber and fodder. "The establishment of phytocaps would offer an additional and economical way of reducing methane emission from landfills," the researchers conclude.

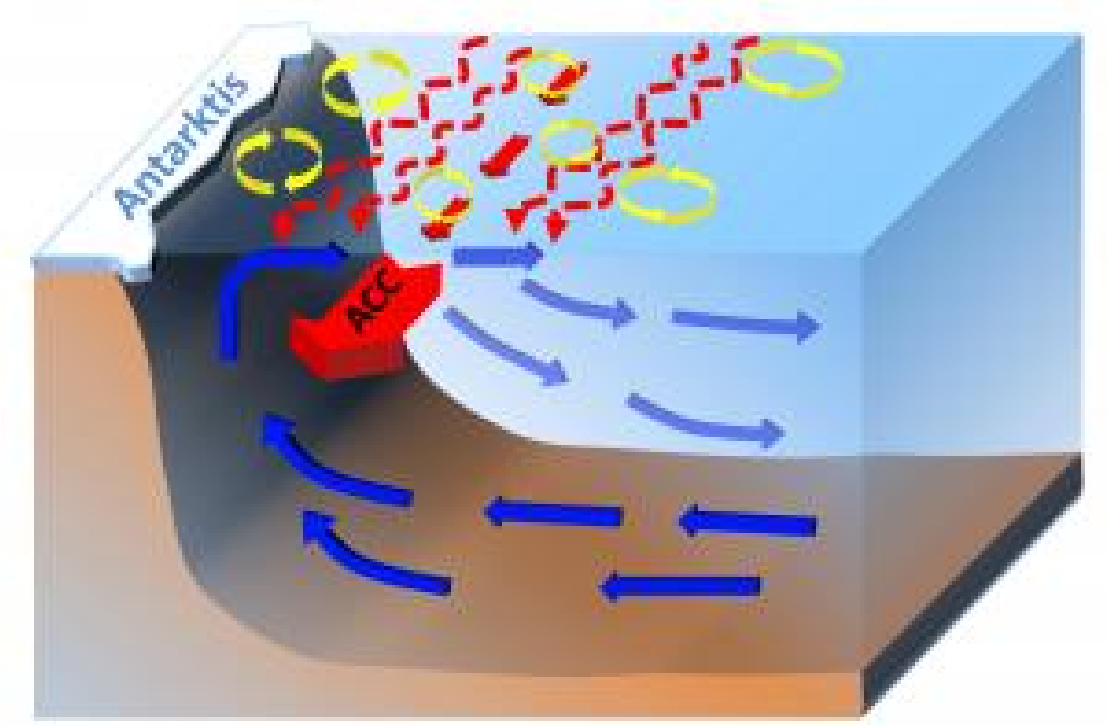
Journal reference:

1. Kartik Venkatraman and Nanjappa Ashwath. **Can phytocapping technique reduce methane emission from municipal landfills?** *International Journal of Environmental Technology and Management*, 2009, 10, 4-15

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

http://www.sciencedaily.com/releases/2008/11/081124102704.htm

Climate Clues In Southern Ocean: Ocean Currents Surprisingly Resistant To Intensifying Winds



Schematic diagram of the circulation in the Antarctic Circumpolar Current (ACC). The ACC (red) is surrounding the Antarctic continent in eastern direction while the current shows intensive meanders and eddies (yellow). Crossways at the northern rim of the ACC large-scale downwelling of surface water to depth of app. 1000 meters takes place whereas at the south rim water is upwelled from greater depths. (Credit: Image courtesy of Leibniz Institute of Marine Sciences (IFM-GEOMAR))

ScienceDaily (Dec. 2, 2008) — The Antarctic Circumpolar Current is the current system with the largest volume transport in the world ocean. Between 40° and 60°S strong westerlies move about 140 million cubic meters of water per second around the Antarctic continent (this is about five times the transport of the Gulf Stream).

Vertical motions associated with this current have been responsible for transporting a substantial fraction of the anthropogenic carbon dioxide emissions from the atmosphere to the deep ocean, thereby effectively damping the rate of global warming.

Investigations in this key region of the world ocean have been hampered by a sparse database due to the logistical challenges for ship based expeditions in the high-latitude Southern Ocean.

“In our study we used data obtained by the international Argo Programme”, explains Prof. Claus Böning from the Leibniz Institute of Marine Sciences (IFM-GEOMAR) in Kiel, Germany. Argo is a system of currently 3000 autonomous free-floating robotic systems which are surveying the world ocean. Every 10 days these buoys measure temperature and salinity profiles over the upper 2000 meters. These measurements are transmitted to land stations via satellite. “For this study about 52,000 profiles of more than 600 Argo-drifters in the Southern Ocean were used and compared with historic ship measurements”, explains oceanographer Astrid Dispert from IFM-GEOMAR. For this analysis the extensive archives of the Australian marine research centre in Hobart, Tasmania were also used.

As expected, the observations in the subpolar ocean demonstrate an increase of water temperature and a decrease in salinity at the same time. Nevertheless, in contradiction to the simulations of various climate

models the data show no significant changes in water transport. “Our results point to one important thing: Eddies which are currently not resolved in climate models might be the key process in controlling the transport of the ACC”, Prof. Böning explains. Hence, his conclusion is that investigations with high-resolution ocean models are required to test this hypothesis. “Of course, besides the simulations we also need further observations”, adds Prof. Martin Visbeck (IFM-GEOMAR). “Thanks to the international Argo observations programme we now have continuously access to data from a worldwide network of more than 3000 profiling-drifters. This is a quantum leap in the field of ocean observations, which, together with high resolution modelling gives us new insights about long-term changes in the ocean.“

Further investigations have to show whether the results are robust. If confirmed, this would in one way be good news: Until now the Southern Ocean is the biggest oceanic sink for anthropogenic carbon dioxide and therefore a crucial regulator for the atmospheric carbon dioxide concentration. Climate models predicted a severe reduction in the southern ocean carbon dioxide uptake due to wind-forced changes in the current fields. Now high-resolution models are needed to assess the role of the hitherto unresolved ocean eddies in the Southern Ocean’s response to the progressive changes in the atmospheric conditions.

Journal reference:

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Adapted from materials provided by Leibniz Institute of Marine Sciences (IFM-GEOMAR), via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081123222842.htm

Pros And Cons Of Gastric Bypass Surgery For Severe Obesity

ScienceDaily (Dec. 2, 2008) — Severely obese patients who underwent two different gastric bypass techniques had lost up to 31 per cent of their Body Mass Index (BMI) after four years, with no deaths reported among the 50 study subjects, according to the November issue of the British Journal of Surgery.

The number of patients suffering from high blood pressure fell by 76 per cent, diabetes fell by 90 per cent and cases of dyslipidaemia – abnormal concentrations of lipids or lipoproteins in the blood – fell by 77 per cent.

However 29 complications were reported in 27 patients, including minor wound infections and narrowing of the anastomotic suture, and ten patients had to be operated on again in the four-year period after surgery.

Surgeons at the University Hospital Zurich, Switzerland, carried out the study to compare two techniques and find out whether varying the length of the small bowel limb during surgery could offer superior weight loss.

It had been suggested by several studies that a longer length would reduce the body's ability to absorb certain sugars and fats.

As a result of the four-year study, they now perform proximal gastric bypass as the operation of first choice, having decided that the distal gastric bypass technique, with its longer alimentary limb, doesn't offer any significant advantages but does have a number of drawbacks.

"There has been an ongoing debate about whether having a longer limb offers the patient greater weight loss and we decided to compare both techniques" explains Dr Markus Muller from the University's Department of Visceral and Transplant Surgery.

Fifty patients having laparoscopic gastric bypass surgery were match-paired, with 25 undergoing the proximal technique and 25 undergoing the distal technique. The alimentary limb length in the proximal surgery group was 150cm and this increased to between 200cm and 400cm in the distal group.

The study subjects' BMIs averaged 45.9 in the proximal group and 45.8 in the distal group. All had been obese for more than five years and had failed to lose weight using conventional methods for at least two years. Forty were female, their average age was 38 and their average weight was 126kg.

Key findings included:

- BMI decreased from 45.9 to 31.7 in the proximal group (31 per cent) and from 45.8 to 33.1 in the distal group (28 per cent).
- Average operating time was significantly longer in patients undergoing distal than proximal bypass surgery (242 minutes versus 170 minutes) and distal patients stayed in hospital longer (nine days versus eight days).
- Over the four-year follow-up, 29 complications were reported in 11 patients in the proximal group and 16 patients in the distal group. 12 repeat operations were necessary, four in the proximal group and eight in the distal group. Two patients - one in each group - had two operations for both early and late complications.
- Sixteen early complications were reported in the first 30 days after surgery - eight in each group. Eight of these were wound infections, there were two cases each of internal hernia, narrowing of the anastomotic suture and pulmonary embolism and one case each of staple-line bleeding and intra-abdominal abscess. Three reoperations and two endoscopic dilatations were required.

- Thirteen late complications were reported 48 months after surgery, including seven internal hernias and three cases where the anastomotic suture had narrowed. There was also one case each of anastomotic ulcer, foreign body (part of a suction drain) and severe malnutrition. Nine reoperations and three endoscopic dilatations were required.
- Before they received their gastric bypass, 29 patients had been suffering from high blood pressure. Two years after surgery this had dropped to seven patients (from 14 to two in the proximal group and 15 to five in the distal group).
- Diabetes declined from 19 patients to two (from ten to two in the proximal group and nine to zero in the distal group).
- The number of patients with dyslipidaemia – abnormal concentrations of lipids or lipoproteins in the blood – fell from 39 to nine (from 20 to four in the proximal group and 19 to five in the distal group).

"Our study found that both laparoscopic and distal bypass operations were feasible and safe with no deaths" says Dr Muller. "There were no significant statistical differences between the two techniques when it came to weight loss or reducing health issues such as high blood pressure or diabetes.

"However, we were very concerned that one of the distal patients developed severe protein malnutrition, because malnourished patients have high complication rates after surgery. A further operation was carried out to convert the distal bypass to a proximal bypass.

"As a result we now perform proximal gastric bypass surgery as the operation of first choice in morbidly obese patients."

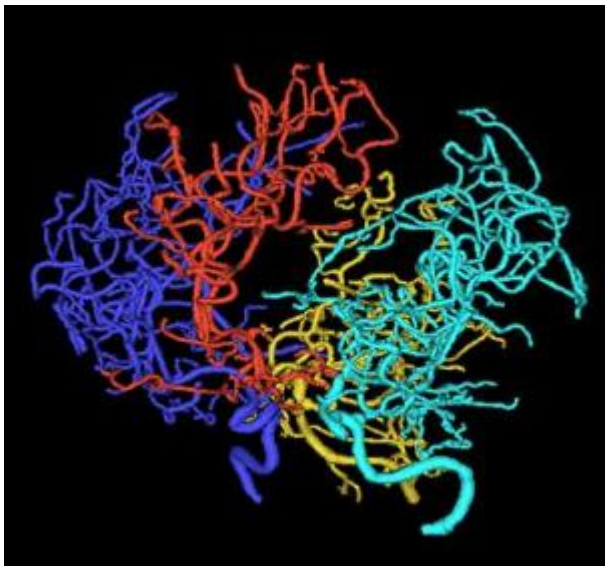
Journal reference:

1. Müller et al. **Long-term follow-up of proximal versus distal laparoscopic gastric bypass for morbid obesity**. *British Journal of Surgery*, 2008; 95 (11): 1375 DOI: 10.1002/bjs.6297

Adapted from materials provided by Wiley - Blackwell, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/11/081118071426.htm

Exercise Helps Prevent Age-related Brain Changes In Older Adults



A 3-D model of the blood vessels extracted from an MR angiography image. (Credit: Image courtesy of Radiological Society of North America)

ScienceDaily (Dec. 2, 2008) — Older adults who exercise regularly show increased cerebral blood flow and a greater number of small blood vessels in the brain, according to findings presented today at the annual meeting of the Radiological Society of North America (RSNA).

The study, conducted at the University of North Carolina (UNC) – Chapel Hill, is the first to compare brain scans of older adults who exercise to brain scans of those who do not.

"Our results show that exercise may reduce age-related changes in brain vasculature and blood flow," said presenter Feraz Rahman, M.S., currently a medical student at Jefferson Medical College in Philadelphia. "Other studies have shown that exercise prevents cognitive decline in the elderly. The blood vessel and flow differences may be one reason."

The researchers recruited 12 healthy adults, age 60 to 76. Six of the adults had participated in aerobic exercise for three or more hours per week over the last 10 years, and six exercised less than one hour per week. All of the volunteers underwent MRI to determine cerebral blood flow and MR angiography to depict blood vessels in the brain.

Using a novel method of three-dimensional (3-D) computer reconstruction developed in their lab, the researchers were able to make 3-D models of the blood vessels and examine them for shape and size. They then compared the blood vessel characteristics and how they related to blood flow in both the active and inactive groups.

The results showed that the inactive group exhibited fewer small blood vessels in the brain, along with more unpredictable blood flow through the brain.

"The active adults had more small blood vessels and improved cerebral blood flow," said the study's senior author, J. Keith Smith, M.D., Ph.D., associate professor of radiology at UNC School of Medicine. "These findings further point out the importance of regular exercise to healthy aging."

The study was funded by the UNC Biomedical Research Imaging Center and by a grant from the National Institutes of Health.

Co-authors are Elizabeth Bullitt, M.D., Laurence, Katz, M.D., and Bonita Marks, Ph.D.

Adapted from materials provided by Radiological Society of North America.

http://www.sciencedaily.com/releases/2008/12/081201081727.htm

New Cognitive Telerehabilitation Program Uses Virtual Reality

Researchers have designed a three-dimensional space has been designed to help improve functional capacity in the daily life activities of people with cognitive deficits caused by acquired brain damage. (Credit: Image courtesy of Universitat Politècnica de Catalunya)

ScienceDaily (Dec. 2, 2008) — The Guttmann Institute, the Biomedical Engineering Research Center (CREB) and the Department of Software of the Universitat Politècnica de Catalunya (UPC), as well as other science and technology partners, are working on a telerehabilitation program for treating people with cognitive deficits caused by acquired brain damage. A three-dimensional space has been designed to help these people improve their functional capacity in daily life activities.

The Guttmann Institute, a university institute attached to the Autonomous University of Barcelona (UAB), has been developing a clinical research program over the last five years. Now, with the collaboration of the Generalitat's Ministry of Universities, Research and the Information Society and Health Department, it has created the Cognitive Rehabilitation Platform (PREVIRNEC) to treat cognitive sequelae associated with brain damage. The project's leader is Dr. Teresa Roig Rovira, head of the Neuropsychology Unit at the Institute.

The PREVIRNEC platform enables therapists to personalize treatment plans: intensive rehabilitation can be programmed automatically for the required length of time, the results monitored and the level of difficulty adjusted according to patients' performance in previous sessions.

A multidisciplinary team of researchers is currently working on the project. The UPC's CREB, coordinated by lecturer Daniela Tost, is in charge of 3D software, the Guttmann Institute, a benchmark in neurorehabilitation, contributes neuropsychological and therapeutic knowledge, and a group from the Rovira i Virgili University is responsible for distributed software.

The aim of this project is to use software to meet the treatment needs of patients with acquired brain damage. The software promotes the rehabilitation of affected cognitive functions by representing everyday, real life situations in a virtual world.

All of the software that has been designed has two applications. It offers patients a three-dimensional IT platform on which to carry out their cognitive rehabilitation exercises. In addition, it provides a web interface for the therapist, through which different exercises can be programmed for each individual, their performance monitored, their progress assessed and their rehabilitation treatment plan adapted, if required.

Currently, the main limitation of conventional cognitive rehabilitation is the difference between the types of activities used in therapeutic sessions and the real difficulties that patients face after treatment. The introduction of virtual reality applications helps to reduce this gap between clinical practice and everyday life.

In this innovative proposal, the contribution of the UPC's Computer Science in Engineering Group (GIE) involves developing virtual realities of everyday spaces, for example the kitchen, in which the patient has to carry out several tasks, such as putting things away in the fridge or preparing a salad. These kinds of tasks, which are difficult to simulate in a clinical setting, can help patients to work on their ability to plan, sequence, categorize or use their memory.

The flexibility and adaptability of this computer technology means that it can be used in the rehabilitation of other types of patients who also require cognitive treatment to improve their quality of life.

The project is still in progress and the following have been incorporated: new technology partners, such as the Biomedical Engineering and Telemedicine Center (GBT) of the Technical University of Madrid; knowledge in the field of neurosciences, provided by the Catalan Institute of Aging (FICE); the UAB, in the form of the Cognitive Neuroscience Research Group; and the recognition and drive of ICT industries, represented by ICA and Vodafone, as the result of a research, development and innovation grant that was awarded through the AVANZA program.

Adapted from materials provided by Universitat Politècnica de Catalunya.

http://www.sciencedaily.com/releases/2008/12/081201082357.htm

Newborns Exposed To Maternal Smoking More Irritable, Difficult To Soothe

ScienceDaily (Dec. 2, 2008) — Previous studies have shown that babies exposed to tobacco in utero are more likely to have a low birth weight and are at increased risk for sudden infant death syndrome. Now new research by The Miriam Hospital reveals that these babies are also less likely to self-soothe and are more aroused and excitable than newborns whose mothers did not smoke during pregnancy.

Researchers from The Miriam Hospital's Centers for Behavioral and Preventive Medicine say early identification and targeted intervention efforts aimed at both infants and parents may help prevent possible disruption in early maternal-infant bonding and, ultimately, long-term adverse outcomes. The study is published online by the Journal of Pediatrics.

"A baby who is harder to soothe and more irritable could be more difficult to take care of and could potentially affect the developing mother-child relationship, especially for mothers who are already stressed and have fewer resources," says lead author Laura Stroud, PhD, a psychologist with The Miriam Hospital's Centers for Behavioral and Preventive Medicine. "We need better treatment programs to help women not smoke during pregnancy, to keep them from starting smoking after the baby is born, and to help them take care of an excitable or colicky baby."

Between 11 and 30 percent of women continue to smoke during pregnancy, according to the Centers for Disease Control and Prevention. In addition to the physical side effects, tobacco exposure in utero has also been linked to long-term adverse neurobehavioral outcomes in children, including conduct disorder and hyperactivity. However, researchers say relatively less attention has focused on the effects of maternal smoking on newborn neurobehavior.

In the study, Stroud and colleagues from Women & Infants Hospital in Providence, RI, and the Warren Alpert Medical School of Brown University focused on newborns between 10 and 27 days old. The researchers decided on this infant age range because it is well past the half-life of nicotine, meaning the acute effects of nicotine withdrawal were unlikely to be a factor in the study. All 56 babies – 28 smoking-exposed and 28 unexposed – were healthy and full-term. Maternal social class, age and alcohol use were similar in each group.

Mothers in the study were assigned to the smoking or non-smoking group based on self-reports of cigarette use during pregnancy assessed shortly after babies were born. This was verified biochemically by measuring cotinine, the primary metabolite of nicotine, in the mother's saliva. Cotinine is readily passed from mother to infant, with the baby absorbing nearly as much as the mother does.

On average, the number of cigarettes mothers smoked each day decreased over the course of the pregnancy, from about 15 cigarettes per day in the first trimester to approximately five cigarettes in the third trimester.

Postnatal smoke exposure was quantified by infant saliva cotinine levels. All infants were then assessed using the Neonatal Intensive Care Unit (NICU) Network Neurobehavioral Scale, a tool developed for the National Institutes of Health to measure the effects of prenatal drug exposure in infants, including withdrawal and general signs of stress.

According to the study's findings, smoking-exposed infants showed a greater need for handling, or external intervention, in order to be soothed and calmed down. These babies also tended to be more easily aroused and excitable.

"Although the effects of maternal smoking at 10 to 27 days were subtle, in combination with a high-stress postnatal environment and deficits in parenting, they could represent early precursors for long-term,

negative behavioral outcomes," says Stroud, who is also an assistant professor of psychiatry (research) at Alpert Medical School.

The study was funded by the National Institutes of Health; Stroud was supported by a grant from the Robert Wood Johnson Foundation Tobacco Etiology Research Network. Co-authors were Barry Lester, PhD, Amy Salisbury, PhD, and Linda Lagasse, PhD, from Women & Infants Hospital and the Brown Center for the Study of Children at Risk; George D. Papadonatos, PhD, from the Center for Statistical Sciences at Brown University; and Rachel L. Paster, Raymond Niaura, PhD, and Cynthia Battle, PhD, from Alpert Medical School.

Adapted from materials provided by Lifespan.

http://www.sciencedaily.com/releases/2008/12/081201144729.htm

Cell Phones That Never Need To Be Charged? Sound Wave-powered Devices Possible

A new advance in piezoelectrics may lead to self-powering cell phones and other electronic devices that can convert sound waves produced by the user into the energy it needs to keep running. (Credit: iStockphoto/Roberta Casaliggi)

ScienceDaily (Dec. 2, 2008) — Imagine a self-powering cell phone that never needs to be charged because it converts sound waves produced by the user into the energy it needs to keep running. It's not as far-fetched as it may seem thanks to the recent work of Tahir Cagin, a professor in the Artie McFerrin Department of Chemical Engineering at Texas A&M University.

Utilizing materials known in scientific circles as "piezoelectrics," Cagin, whose research focuses on nanotechnology, has made a significant discovery in the area of power harvesting – a field that aims to develop self-powered devices that do not require replaceable power supplies, such as batteries.

Specifically, Cagin and his partners from the University of Houston have found that a certain type of piezoelectric material can covert energy at a 100 percent increase when manufactured at a very small size – in this case, around 21 nanometers in thickness.

What's more, when materials are constructed bigger or smaller than this specific size they show a significant decrease in their energy-converting capacity, he said.

His findings, which are detailed in an article published this fall in "Physical Review B," the scientific journal of the American Physical Society, could have potentially profound effects for low-powered electronic devices such as cell phones, laptops, personal communicators and a host of other computer-related devices used by everyone from the average consumer to law enforcement officers and even soldiers in the battlefield.

Many of these high-tech devices contain components that are measured in nanometers – a microscopic unit of measurement representing one-billionth of a meter. Atoms and molecules are measured in nanometers, and a human hair is about 100,000 nanometers wide.

Though Cagin's subject matter is small, its impact could be huge. His discovery stands to advance an area of study that has grown increasingly popular due to consumer demand for compact portable and wireless devices with extended lifespans.

Battery life remains a major concern for popular mp3 players and cell phones that are required to perform an ever-expanding array of functions. But beyond mere consumer convenience, self-powering devices are of major interest to several federal agencies.

The Defense Advanced Research Projects Agency has investigated methods for soldiers in the field to generate power for their portable equipment through the energy harvested from simply walking. And sensors – such as those used to detect explosives – could greatly benefit from a self-powering technology that would reduce the need for the testing and replacing of batteries.

"Even the disturbances in the form of sound waves such as pressure waves in gases, liquids and solids may be harvested for powering nano- and micro devices of the future if these materials are processed and manufactured appropriately for this purpose," Cagin said.

Key to this technology, Cagin explained, are piezoelectrics. Derived from the Greek word "piezein," which means "to press," piezoelectrics are materials (usually crystals or ceramics) that generate voltage when a form of mechanical stress is applied. Conversely, they demonstrate a change in their physical properties when an electric field is applied.

Discovered by French scientists in the 1880s, piezoelectrics aren't a new concept. They were first used in sonar devices during World War I. Today they can be found in microphones and quartz watches. Cigarette lighters in automobiles also contain piezoelectrics. Pressing down the lighter button causes impact on a piezoelectric crystal that in turn produces enough voltage to create a spark and ignite the gas.

On a grander scale, some night clubs in Europe feature dance floors built with piezoelectrics that absorb and convert the energy from footsteps in order to help power lights in the club. And it's been reported that a Hong Kong gym is using the technology to convert energy from exercisers to help power its lights and music.

While advances in those applications continue to progress, piezoelectric work at the nanoscale is a relatively new endeavor with different and complex aspects to consider, said Cagin.

For example, imagine going from working with a material the size and shape of a telephone post to dealing with that same material the size of a hair, he said. When such a significant change in scale occurs, materials react differently. In this case, something the size of a hair is much more pliable and susceptible to change from its surrounding environment, Cagin noted. These types of changes have to be taken into consideration when conducting research at this scale, he said.

"When materials are brought down to the nanoscale dimension, their properties for some performance characteristics dramatically change," said Cagin who is a past recipient of the prestigious Feynman Prize in Nanotechnology. "One such example is with piezoelectric materials. We have demonstrated that when you go to a particular length scale – between 20 and 23 nanometers – you actually improve the energy-harvesting capacity by 100 percent.

"We're studying basic laws of nature such as physics and we're trying to apply that in terms of developing better engineering materials, better performing engineering materials. We're looking at chemical constitutions and physical compositions. And then we're looking at how to manipulate these structures so that we can improve the performance of these materials."

Adapted from materials provided by Texas A&M University, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/12/081201162127.htm

An Ace For Visually-impaired Students In Computer Science

The visually impaired students who took part in the ImagineIT workshop at the Rochester Institute of Technology programmed robots like these to be able to perform tasks such as handling balls and navigating a maze. (Credit: Courtesy of Stephanie Ludi, Rochester Institute of Technology)

ScienceDaily (Dec. 2, 2008) — Many computing luminaries, such as Steve Jobs or Bill Gates, have an early experience in common--an engaging experience in middle school or high school that sparked an excitement for learning everything they could about computers. Today, many young people are surrounded by computing at home and in school, and some of them will likely find a similar passion that will lead them to push tomorrow's frontiers in computer science.

For visually impaired students, however, the pathways to studying computer science are more complicated. While technologies can make it easier for them to use computers, the visual nature of modern computing makes it difficult for them to participate in programming courses and other types of computing instruction. These students also commonly lack the resources and preparation other students get in computing before they get to college, and there is a dearth of visually impaired role models in computing to inspire them as they pursue their degrees.

Enter Project Accessible Computing Education (ACE), an NSF-funded initiative at the Rochester Institute of Technology (RIT). The project is designed to help prepare visually impaired middle school and high school students participate in computer science programs at the collegiate level. Project ACE's ultimate goal is to increase the number of visually impaired students pursuing degrees in computer science and give them the foundations they need to be fully successful in their studies and beyond.

According to Stephanie Ludi, a professor of software engineering at RIT and the principal investigator for the project, in the long run, encouraging these students will benefit everyone who uses a computer. "Because of the unique perspective they have," Ludi said in an interview this month, "they can create software that is really more usable for everybody."

The project is focused on three areas: better preparation for visually impaired students before college, support for these students as they face challenges in computing that other students do not, and educating teachers in how to best help these students learn and achieve.

Last year, the project conducted an interactive workshop for visually impaired students and their parents called ImagineIT. The four-day workshop, held at RIT's B. Thomas Golisano College of Computing and Information Sciences, brought together more than a dozen visually impaired students and their parents from around the country and gave them an opportunity to tackle "real world" computing applications and learn about career opportunities in computing. The students worked collaboratively on a number of challenges, including building and programming Lego Mindstorm robots to interact with the environment by navigating through a maze to find a sound source.

According to Thomas Reichlmayr, also a professor of professors of software engineering at RIT and co-principal investigator on the project, the workshop was helpful for everyone. "It was a good opportunity for the students," Reichlmayr said, "but also for their parents to network with other parents, to share experiences with their school districts and their own experiences as well."

In addition to helping these young programmers gain a better appreciation for computer science, Project ACE also used the experience as a foundation for future workshops centered on preparing teachers to work with these students.

Ludi says that Project ACE will repeat the ImagineIT workshop next year at RIT and also in Southern California.

In the next few years, the students from the first ImagineIT workshop will enter college. According to Ludi, some of them have already expressed interest in majoring in computer science.

Adapted from materials provided by National Science Foundation.

http://www.sciencedaily.com/releases/2008/12/081201144559.htm

Symptoms Of Depression Associated With Increase In Abdominal Fat

ScienceDaily (Dec. 2, 2008) — Older adults with symptoms of depression appear more likely to gain abdominal fat, but not overall fat, over a five-year period, according to a new report.

About 10 percent to 15 percent of older adults have symptoms of depression, according to background information in the article. "Depression has been associated with the onset of diabetes, cardiovascular disease and cardiac mortality [death]," the authors write. "To better prevent occurrence of these major disabling and life-threatening diseases, more insight into underlying mechanisms relating depression to these disorders is needed."

Nicole Vogelzangs, M.Sc., of VU University Medical Center, Amsterdam, the Netherlands, and colleagues studied 2,088 adults age 70 to 79 years. Participants were screened for depression at the beginning of the study and their overall and abdominal obesity was recorded then and again after five years. Measures of overall obesity included body mass index and body fat percentage, while abdominal obesity was assessed using waist circumference, sagittal diameter (distance between the back and the highest point of the abdomen) and visceral fat (fat between the internal organs) measured by computed tomography.At the beginning of the study, 4 percent of participants had depression. After adjusting for sociodemographic and other characteristics associated with weight changes, depression was associated with an increase in sagittal diameter and visceral fat over five years. "Such an association was not found for an increase in overall obesity and also appeared to be independent of changes in overall obesity, suggesting that depressive symptoms are rather specifically associated with fat gain in the visceral region," the authors write.

There are several mechanisms by which depression might increase abdominal fat, they note. Chronic stress and depression may activate certain brain areas and lead to increased levels of the hormone cortisol, which promotes the accumulation of visceral fat. Individuals with depression may have unhealthier lifestyles, including a poor diet, that could interact with other physiological factors to produce an increase in abdominal obesity."Our longitudinal results suggest that clinically relevant depressive symptoms give rise to an increase in abdominal obesity, in particular visceral fat, which seems to be stronger than and independent of overall obesity," the authors conclude. "This could also help explain why depression is often followed by diabetes or cardiovascular disease. Future research should further disentangle these mechanisms because this will yield important information for prevention or treatment of depression-related health consequences."

This study was supported by contracts from the National Institute on Aging, a travel grant from the Young Academy of the Royal Netherlands and in part by the Intramural Research Program of the National Institutes of Health, NIA. Data analyses were supported by a grant from the National Heart, Lung, and Blood Institute.

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Adapted from materials provided by JAMA and Archives Journals.

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