Infoteca's E-Journal

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Nature, Up Close and Personal
By HOLLAND COTTER

Summer, which can be hard in the city, could be heaven to the painter Charles Burchfield, the 20th-century mystic of American light. Because he spent most of his time in a leafy suburb of Buffalo, to him the season meant trees aureoled in noonday sunshine, afterglow skies as cool as the song of a thrush and gardens pulsing with the music of crickets in moonlight.

Yet he was never at ease. Even with nature he was tense and agonized. Early on, Burchfield concluded, as God once had, that Paradise meant no people, and he rarely painted any. He also learned that Hell was a society of one: himself. A natural ecstatic, he was also a chronic depressive: not a passive shut-down case, but a lamenter and yearner. “Oh God — How to get back there!” he wrote in his journal, “there” being childhood, innocence, home.

A mood-swing dynamic seems pronounced in the survey called “Heat Waves in a Swamp: The Paintings of Charles Burchfield” at the Whitney Museum of American Art, maybe in part because the show was organized by Robert Gober, the contemporary American artist whose own work mines the neurotic underside of the American psyche. Yet even while emphasizing certain aspects of Burchfield’s career, Mr. Gober gives us nothing but Burchfield himself. The peaks and valleys are all right there in the art.

Born in Ohio in 1893, Burchfield, as early as he could remember, was acutely responsive to nature, in part as a substitute for a lost religious faith. His father, the son of a Methodist minister, had angrily renounced orthodoxy. And when later Burchfield’s mother felt shut out from a local congregation, he rejected religion completely.

He spent four years in art school in Cleveland, absorbed in the thinking of the artist and philosopher Arthur Wesley Dow (1857-1922), who taught that nature should be depicted not realistically but as graphic patterns. In 1916 Burchfield left for New York City with a scholarship to study at the National Academy of Design, but once there he balked and dropped out after a single afternoon. He managed to land a solo show in a bookstore-gallery in Manhattan before heading, desperately homesick, back to Ohio.

By then he was already doing interesting things.

He had settled on watercolor — technically demanding, almost entirely about luminosity — as his primary medium and on landscape, both observed and imagined, as his subject. He was pulling aesthetic stimuli from everywhere: childhood nature books, Japanese prints, Chinese scrolls, Arthur Rackham's Wagner illustrations, Léon Bakst's sets for the Ballets Russes, and painting by Romantic artists like William Blake and, surely, Samuel Palmer.

In 1917, which Burchfield would call his "golden year," this eclectic mélange generated some of his best-known images.

In one titled "The Insect Chorus" the vegetative world becomes a keyed-up anthropomorphic force, with trees rendered as jazzy swirls of bumblebee yellow and black, and the buzz of cicadas notated as clusters of dotted lines.

The same natural energy becomes crushing and funereal in "Church Bells Ringing, Rainy Winter Night," a picture of a steeple looming like a great bug-eyed bird over a squat town as black rain pours down. To Burchfield, at that point simultaneously agnostic and terrified of damnation, the painting expressed the dread that religion instilled in him.

It also incorporated one of his most distinctive conceptual innovations, a lexicon of some two dozen semiabstract designs meant to symbolize negative emotions. These "conventions for abstract thought," as he called them, include a gaping mouth to stand for "dangerous brooding," a pair of blank eyes for "imbecility" and two black whirlpools to represent fear.

He planted these elements in his paintings — the fear symbol dominates the church picture — to give his decorative patterns an expressive personal subtext. Mr. Gober has installed the initial 1917 drawings of these forms at the very beginning of the show, as if to suggest that the art that follows should be read in their light. Much of it can be, but not all.

In 1921 Burchfield moved to Buffalo, married and worked as a designer in a wallpaper company, transferring his nature imagery to a commercial medium. Meanwhile his career as an artist was building, with gallery solos leading, in 1930, to a show of his "golden year" paintings at the fledgling Museum of Modern Art.

Feeling trapped in a job that left him little energy for painting, Burchfield quit commercial work in 1929 only to land in a different trap. He was now painting full time, but the pictures people wanted were of American industry and small-town life, popular subjects during the Great Depression. It was hard for him to say no. Magazine commissions kept coming, and they were turning him into a celebrity.

Again the art he really cared about seemed out of reach or only peripherally in his life — mainly through his habit, which had the character of a compulsion, of drawing wild, sensuous semiabstract designs on stray scraps of paper: telephone notes, shopping lists, card-game score sheets. He dismissively called the sketches "doodles" but pasted thousands of them into albums for safekeeping.

Then in 1944, after his first career retrospective at the Albright-Knox Art Gallery in Buffalo, he decided to do what he had always longed to do, get back to the beginning, to where he had started in his art. He retrieved paintings from around 1917 and began to study and change them. He enlarged their surfaces by adding strips of paper, then reworked and expanded the original images.

One small painting, "The Sphinx and the Milky Way," became an entirely new work at three times its original size, a rapturously spooky fairy-tale version of van Gogh's "Starry Night." A gnarly little 1918 image of

geologic upheaval called “Sun and Rocks” was transformed in 1950, after the addition of a cruciform star, into a scene of mystical visitation.

By that point Burchfield had made his peace with religion, joined a church and returned, refreshed, to the subjects he loved: nature and light. As a consequence the work in the show’s final section, which Mr. Gober has labeled “Great Art and Death,” has a mood of holiday euphoria.

In “Clover Field in June” (1947) sunlight falls like a snow of gold pollen over a world seen from the perspective of a bee on a flower. In “Midsummer in the Woods” (1951-59) a fir tree levitates in a misted clearing. And in “The Four Seasons” (1949-1960) winter, spring, summer and fall recede sequentially into the distance like a succession of brilliantly colored stage flats.

“The Four Seasons” is equal parts Christmas card (Burchfield designed many), Gothic altarpiece and “Fantasia” outtake. It’s kitsch or something close, though the continuing presence of the old codes for fear and brooding indicate a charge of disturbance that faith didn’t touch. In “Early Spring,” left unfinished at Burchfield’s death in 1967, a tree bristles with thorns or spikes. Nature is in tatters; scrawled at the bottom of the picture in the artist’s hand are the words “very dark pit.”

So right to the end it’s hard to know exactly what to do with this doubter-believer and his confessing, witnessing art. Mr. Gober, in collaboration with the Hammer Museum in Los Angeles and the Burchfield-Penney Art Center in Buffalo, presents him with sober, tender attachment. (And tenderness is necessary; some of the paintings look shockingly fragile and faded.)

Burchfield’s intensities are not for all tastes. But this summer if you’re looking for visionary company in the city, someone who has a deep investment in the way light falls, who loves the world with a romantic’s anxiety and avidity, and who will now and then excuse himself to go to “some secret place to think about God,” he’s the artist for you.

“Heat Waves in a Swamp: The Paintings of Charles Burchfield” remains through Oct. 17 at the Whitney Museum of American Art, (212) 570-3600; whitney.org.

http://www.nytimes.com/2010/06/25/arts/design/25burchfield.html?ref=design

The Mysteries of Tobias Wong

By ALEX WILLIAMS

THE designer Karim Rashid was stunned when he read the news online that Tobias Wong, the enfant terrible of the design world, had died on May 30 at 35, in what authorities ruled a suicide. “You’re just starting your career,” he recalled thinking. “Why would you do this?”

Paola Antonelli, the senior curator of architecture and design at the Museum of Modern Art, was in Beirut when she got word. She had to sit on the bed and compose herself, unable to believe it was true.

Rama Chorpash, a design professor in Philadelphia, heard it from a student and it made no sense to him, either. Why would Mr. Wong, the renowned prankster and provocateur, end his own life? “My first thought was that this was another one of Tobi’s stunts,” he said.

Tobias Wong dead? Why? And more to the point, why now? This was no tortured artist, locked in a downward spiral, friends and family said. Complex, mercurial, mischievous — he was all those things. But he was not miserable.

By most accounts, he was actually riding high. Mr. Wong was about to open a new design agency, and was coming off a successful showing at the recent International Contemporary Furniture Fair, a major industry show in New York. At home in the East Village, he and his partner of six years, Tim Dubitsky, a 32-year-old advertising design manager, were talking about having a child by a surrogate. In short, those who knew him well simply couldn’t believe he wanted to take his own life.

Perhaps it is not surprising that Mr. Wong left open questions in death. He continually did so in life. In fact, he built his career on it.

In a field in which so many people want to be the next Philippe Starck, Donald Tobias Wong stood out as a designer who wanted to be the next Duchamp. Deeply influenced by subversive art movements like Dada and Fluxus, he graduated from the sculpture program at the Cooper Union, and went on to produce an acclaimed and influential body of work that questioned concepts like luxury and consumerism in a business that was about promoting them.

He dipped Tiffany pearl earrings in black rubber and sold them in blue Tiffany boxes. He fashioned a duvet and a rose brooch out of black Kevlar (pieces that were shown at MoMA in 2005).

Mr. Wong, who claimed he couldn’t draw, coined the term “paraconceptual” to describe his work. And what other word would you use to describe, say, shimmering strands of Swarovski crystal suspended in a tank of piranhas, a piece he did in collaboration with Amelia Bauer for Art Basel Miami Beach in 2005?

"I don't regard Tobias as a designer," Mr. Rashid said. "I regard him as an artist. His objects were statements. They were profound in the way they made the design community rethink what they were doing, or why they were doing it."

Mr. Rashid was one of about 100 people, many drawn from New York's design community, who turned out for a memorial for Mr. Wong last Monday at the Cappellini showroom in SoHo. True to Mr. Wong's personality, the memorial was informal, lively and slightly outré. (The Russian writer and artist Slava Mogutin, known for his work involving pornography, made a late appearance.)

There were no tearful eulogies. Rather, it resembled a stylish store opening downtown, with people in blocky horn-rim eyeglasses and loafers without socks sipping prosecco and mingling amid displays of Mr. Wong's work: his mirror jigsaw puzzle; his smoking mittens, featuring a hole cut near the fingertips for a cigarette. Some said they half-expected Mr. Wong himself to stroll in and reveal that his death had been another high-concept put-on, perhaps a sly commentary on the primacy of the artist, in juxtaposition to the work itself.

Allan Chochinov, the editor in chief of Core 77, a design Web site, remembered the first time he met Mr. Wong. It was the late '90s, and he was walking down Prince Street when he ran across the boyish designer standing next to a folding table selling capsules — the sort cold medicine comes in — filled with silver leaf.

"I picked one up and said, 'So you eat these?' He was like, 'uh huh.' 'And it turns your poop silver?' And he said, 'yep.' " Mr. Chochinov recalled. "I just had such a smile on my face. I thought, 'O.K.,, we're going to be seeing more of that guy.' "

"You couldn't not remark on his work," he said. "You couldn't not have an opinion."

That included legal opinions. Mr. Wong, famously, was the target of cease-and-desist actions by several companies whose work he cheekily appropriated and subverted, including the fashion designer Issey Miyake (whose Pleats Please dress he turned into a cover for a computer monitor) and McDonald's (whose discontinued model of a coffee spoon, once popular with cocaine users, he plated in gold).

"I've always responded to other work with my work— that's where I fit more into the artist category," Mr. Wong told Azure, a design magazine, in 2003. "I find it really difficult if I'm asked to, say, design a chair. If a manufacturer approached me with that sort of request, I'd be in big trouble."

Indeed, Mr. Wong created a stir in 2001 when he acquired Mr. Starck's plastic Bubble Chair before it was unveiled in the United States, installed a light bulb inside, and transformed it into a piece he called "This Is A Lamp."

His taste for stunts went beyond physical designs. In 2007, the soft-spoken (and stage shy) Mr. Wong sent Mr. Chorpash, the professor and friend, to the podium at a design conference to give an entire presentation pretending to be him — never mind that Mr. Chorpash is tall and Caucasian — while Mr. Wong sat amid baffled audience members, wearing a devilish smile.

What admirers in the design world could not know, however, was that in private, Mr. Wong was given to fits of eccentric behavior that went above and beyond his boundary-pushing professional exploits.

There was the day about a year ago, for example, when Mr. Wong showed up for a breakfast meeting at Balthazar with a glassy look in his eyes and started cadging sausages off a stranger's plate at the next table, recalled Josée Lepage, a friend and colleague who was present.

Or there was the time that Jiminy, a pet cricket he tended with Mr. Dubitsky in their apartment, died. Mr. Dubitsky awoke in the middle of the night to find Mr. Wong meticulously chopping vegetables for the motionless insect, which he had fished out of the garbage. "He was almost tearing up," Mr. Dubitsky recalled. "He was saying: 'Jiminy is not dead! I heard him chirping!' "

There were late-night phone calls that didn't track, e-mail messages in which the logic was off.

The reason for this behavior went beyond the quirks of the creative temperament, friends and family members said: Mr. Wong was, clinically speaking, asleep. For years, he had suffered from a variety of sleep disorders known as parasomnias: in layman's terms, he was a serious, chronic sleepwalker.

During episodes, Mr. Wong would rise from bed in a zombielike trance and perform elaborate tasks (bill clients, make funny outfits for his cats) that require agency and concentration, if not full consciousness. At times, his sleep problems took the form of a related disorder that researchers call sleep terrors — essentially, a half-waking nightmare state that the subject is unable to snap out of.

Given this history, many people who were close to him believe that his death was not an act of will, but, like other sleepwalking episodes, a bizarre out-of-character act that ended tragically.

"This wasn't a typical suicide," Mr. Dubitsky said in an interview at the couple's apartment. "He wasn't angry, he wasn't sad, he wasn't upset. We were always thinking about our future. We wanted kids. We wanted to find a house."

It is possible that Mr. Wong, who left no note, battled inner demons that he never revealed. But friends who saw him during his final weeks said that Mr. Wong showed no signs of significant agitation or distress. He seemed like his normal self: upbeat, albeit with that familiar edge.

"With Tobi, there was sometimes this undercurrent of intensity running beneath the high jinks and laughter," said Aric Chen, a friend and collaborator, describing Mr. Wong's mood during a recent dinner party. (Mr. Chen is also a contributor to The New York Times.)

Mr. Wong was not acting like a man who saw no future. His stepfather, Stephen Chan, said that he found a receipt in Mr. Wong's wallet for an expensive flat-screen television that he had ordered only days before his death.

Mr. Wong, moreover, had no history of mental illness, no health problems and no substance abuse issues, friends and family members said. Unlike many Manhattanites, he wasn't even seeing a therapist. The only problem his partner recalled discussing with him in his final week was how to find transportation for a visit to a friend's country house.

Certainly, it was not always easy to know what was going on inside Mr. Wong's head. He seemed to take life in as if it were composed of the sumptuous, dreamlike visuals in one of his favorite movies, Wong Kar-wai's "In the Mood for Love" — "as this beautiful panoramic of slow-moving things," Mr. Dubitsky said. "That's just the way his mind worked." (He was also colorblind, which is why he designed his wardrobe around grays and whites.)

Mr. Wong, a tireless worker and insomniac, was often exhausted. Born in Vancouver, B.C. (his family was from Hong Kong), he approached the insular New York art and design worlds with the hunger of an outsider.

“He often would tell his mom that he had to work three times as hard as people here to get recognized,” Mr. Chan said.

He pulled all-nighters, and the more stress he experienced, the worse his sleepwalking episodes grew, Mr. Dubitsky said. One or more episodes a week was common. Mr. Wong met with countless doctors and tried numerous remedies — ayurvedic diets, recordings of Tibetan singing bowls, sleeping pills — all unsuccessfully.

On trips home, his mother would leave food on the counter at night, to save him from rummaging the pantry, Mr. Chan said. She would line up chairs in front of the door to the balcony of their high-rise apartment so he wouldn’t wander off it in a daze.

Still, his mother and stepfather never imagined he would really hurt himself. “In a way, we witnessed it without seeing it,” Mr. Chan said.

People close to Mr. Wong learned to recognize the telltale signs. They would get “the look.”

“He’s looking at you, but he’s looking past you, looking through you,” Mr. Dubitsky explained. Mr. Wong might whip up a three-course steak dinner, or run out to the bank. He could not seem to help himself from buying more curios for the apartment online. “If eBay had a rewards program, he’d be platinum,” his partner said.

But sometimes, the episodes turned dark. Mr. Dubitsky would wake up to find him incoherent and sobbing. “I would try to talk to him — ‘What’s wrong, why are you crying?’ ” Mr. Dubitsky said. “But the answers were usually something so bizarre as, ‘Oh it’s not the right color purple.’ They were clearly nonsensical.”

Other times, he seemed panicked, as if fleeing an attacker. Once Mr. Wong even thought that Mr. Dubitsky was someone trying to kill him. “I would hold him and talk to him, just reassure him it’s something else. I’d try to bring him back to reality,” he said.

Then there were the troubling occasions when he showed a capacity for violence. Barbara Moore, an art historian and friend, said that Mr. Wong told her earlier this year that he had pulled a treasured Joseph Beuys artwork off the wall while sleeping and threw it across the room, shattering the glass.

Sleep researchers say that such behavior, while extreme, is not uncommon. Dr. Mark W. Mahowald, the director of the Minnesota Regional Sleep Disorders Center, a prominent sleep research facility at the Hennepin County Medical Center in Minneapolis, explained that “sleepwalking and sleep terrors are the same basic phenomenon.”

In either case, he said, the subject is “half-asleep and half-awake.”

“They are awake enough to perform very complex behaviors, but not awake enough to be aware of or responsible for what they’re doing,” he said.

Dr. Mahowald did not rule out the possibility that a sleepwalker could harm himself unintentionally. Some sleepwalkers will go jogging on the freeway and be killed in traffic, or stroll off the deck of a cruise ship, unaware of their surroundings, he said. He and colleagues even coined the term parasomnia pseudo-suicide, in part because the fatalities are frequently misinterpreted.

Dr. Michel A. Cramer Bornemann, a colleague of Dr. Mahowald, said that the brain's prefrontal cortex is off-line in these cases. "That's important because that's where intent, awareness and motivation resides," he said. "If that's not accessible, you don't have the awareness and motivation. So it's technically not suicide. It's an accident."

No one, however, can know what was going through Mr. Wong's mind the night he died. People looking for signs of a deteriorating mood might linger on the fact that for a recent commissioned piece, Mr. Wong produced a rope with wooden beads that spelled out a Morse code message: "New York, I Love You But You're Bringing Me Down," the title of a song by LCD Soundsystem. Or that he had been listening to a Joni Mitchell meditation on lost innocence, "Both Sides Now," whose lyrics include "so many things I would have done, but clouds got in my way," on a virtual loop at home. Mr. Dubitsky dismissed its significance, saying that Mr. Wong always played songs on repeat, and rarely paid attention to lyrics.

That final day — a clear, warm Saturday— had been particularly serene, Mr. Dubitsky said. The couple slept in, then dropped by the Union Square farmers' market to shop for flowers for their planter. Later, they considered finally removing the Christmas decorations from their mantel, but decided it was too pretty a day to be cooped up inside, so they just sat on their stoop and watched people pass by.

After dinner, they read, sent e-mail messages, then dozed off together on the couch. When he woke up a few hours later, Mr. Dubitsky recalled, Mr. Wong had slipped into a sleepwalking state. Mr. Dubitsky tried to chat with him, then went to bed.

The next morning, he found his partner dead. The office of the chief medical examiner in Manhattan ruled it a suicide by hanging.

Mr. Dubitsky remains convinced that it was sleepwalking. Before his death, Mr. Wong himself seemed to realize that such a tragic accident was possible.

During the interview in the apartment, Mr. Dubitsky produced a small framed copy of the children's prayer, "Now I Lay Me Down to Sleep," handwritten and signed (with hearts) "Tobi," that hung in the home's entryway. Following the line, "If I should die before I wake," however, Mr. Wong had added a few more — a darkly sardonic apology to his partner in case he hurt anyone while asleep.

"It was his way of saying, 'If I ever do anything out of control ... ' " Mr. Dubitsky said, his voice trailing. "This was kind of a joke," he added ruefully.

And perhaps not.

http://www.nytimes.com/2010/06/27/fashion/27Wong.html

Inspired by Wishes, Memories, Dirty Shoes

By KAREN ROSENBERG

What do you wish for? In Rivane Neuenschwander's first museum survey, you can write the wish on a piece of paper and perform a ritual to make it come true. You can also, if you like, work with a police sketch artist to recall the face of your first love. This is Ms. Neuenschwander's contribution to Conceptualism: art that's conciliatory, collaborative and amenable.

At the New Museum, it's also a rite of purification: Dakis detox. Ms. Neuenschwander's exhibition, "A Day Like Any Other," wipes away all traces of the huge, hypersexualized trophies from "Skin Fruit," the museum's previous show of works from the collection of the trustee Dakis Joannou.

Ms. Neuenschwander makes films, photographs, sculptures, actions and installations, all linked by an emphasis on the organic, ephemeral and elusive. Circular motifs, including eggs, soap bubbles and dots of confetti, appear frequently.

As part of the show, Ms. Neuenschwander has installed a series of flip clocks around the museum. Each is permanently set to 00:00; the hour and minute indicators turn over, but time marches in place.

In another work, water leaks through tiny holes drilled in hanging buckets and collects in a second set of buckets resting on the floor. When those receptacles fill, after about four hours, attendants start the cycle anew.

Ms. Neuenschwander is Brazilian, and Brazil's rich history of Conceptual art movements, including Neo-Concretism and Tropicália, guides her work but doesn't script it. The contemporary Latin Americans Félix González-Torres and Gabriel Orozco have some sway, but so does an international cohort of Fluxus artists.

Like Mr. Orozco, she thinks globally and locally — often at the same time. For a new series called “After the Storm,” she left maps of New York counties outside during torrential rains at her home in Brazil. In an earlier piece (in the catalog, but not the show), she collected postcards of Brazilian places named after foreign cities or countries and invited viewers to mail them anywhere in the world.

Her work feels most vital and current when it involves some kind of interaction or transaction, whether it’s one to one or many to many. That happens only a few times in this concise exhibition, organized by the museum’s chief curator, Richard Flood.

It begins in the lobby gallery with “I Wish Your Wish,” an installation that dates from 2003. It’s modeled on a tradition from the Church of Nosso Senhor do Bonfim in Bahia, Brazil: worshipers tie brightly colored silk ribbons to their wrists and wear them until they fall off, at which point their wishes are granted. In Ms. Neuenschwander’s cloying yet irresistible version, museumgoers pluck ribbons from the wall and replace them with their own wishes, written on rolled-up pieces of paper.

To religion, Ms. Neuenschwander adds recycling and a bit of crowd-sourcing. The ribbons at the New Museum come printed with wishes from past versions of the installation, just as the wishes left behind will be used in subsequent projects. You’re meant to believe that your own wish won’t come true unless you wear someone else’s. In essence, Ms. Neuenschwander has turned private desire into collective responsibility.

“I Wish Your Wish” is the sort of work that makes a statement at biennials but doesn’t fit neatly into a midcareer survey. The rest of the show feels just as disjointed, though the New Museum’s emphatically vertical layout is partly to blame.

The fourth floor is the weakest, inducing a kind of boredom that doesn’t always pass for Zen enlightenment. Its main attractions are the dripping buckets of “Rain Rains” (2002) and a floor piece called “Walking in Circles” (2000) that, for now, is barely perceptible. (Consisting of circles of adhesive glue that trap particles of dirt from visitors’ shoes, it should become more visible as the show goes on.)

On the walls, the maps from “After the Storm” (2010) reinforce the water theme. Yet any suggestion of apocalyptic flooding is canceled out by the sunny abstractions Ms. Neuenschwander has painted over the eroded paper.

There’s more suspense to “The Fall” (2009), a short, looped video of an egg being carried on a spoon in carnival-race fashion. Even better is “The Tenant” (2010), another video (this one on the third floor) that’s inspired by Roman Polanski’s 1976 film of the same title. In it the camera follows a soap bubble as it drifts through the rooms of an empty apartment — actually Ms. Neuenschwander’s studio. The Brazilian duo O Grivo, with whom the artist collaborates frequently, contributes a soundtrack of clattering, scraping noises that makes the bubble’s voyage seem all the more perilous.

The third floor confirms that Ms. Neuenschwander’s films, actions and installations are more interesting than her objects. (This is true even when she doesn’t actually generate the objects herself, as in the too cute “Involuntary Sculptures” made by people fiddling with straw wrappers and napkins at bars and restaurants.) It also suggests that her best ideas emerge in dialogue with other artists and writers and moviemakers in particular.

The largest of the upper-floor installations, “The Conversation” (2010), has an intriguing back story. Before her show opened, Ms. Neuenschwander hired a private security firm to “bug” a section of the gallery. She

then hunted for the tiny listening devices by ripping up the carpet and wallpaper. Visitors can survey the trashed room and listen to the sounds of Ms. Neuenschwander's search through small speakers attached to the original surveillance points.

"The Conversation" is titled after Francis Ford Coppola's 1974 movie starring Gene Hackman as a paranoid surveillance expert, but Robert Morris's 1961 sculpture "Box With the Sound of Its Own Making" seems just as germane. Ms. Neuenschwander's piece reflects more method than madness; you can see that she sliced the carpet into neat strips and the wallpaper into squares.

Forensics also factor into "First Love" (2005), inspired by Samuel Beckett's novella of the same title. Here, visitors work with a police sketch artist to establish likenesses of their earliest love objects. It's a lengthy process, conducted over an hour or two with the aid of an F.B.I. identification book, and it involves questions that are surprisingly difficult to answer. ("Was his face more boyish, or masculine?" "How much did his ears stick out?") The final sketches are strictly personal, but the process is universally fascinating; romantic and criminal trauma are revealed to have similarly deleterious effects on memory.

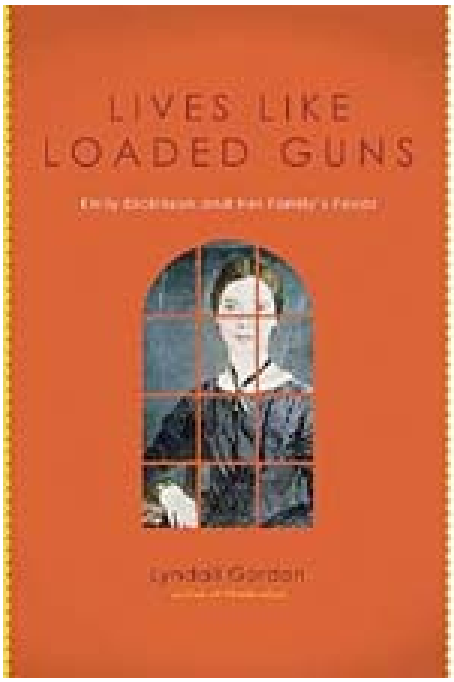
Not so with Ms. Neuenschwander's poetically reciprocal art, which is likely to stick with you long after leaving the museum. You're likely to stick with it, too, tangibly and intangibly: with a wish, or a piece of dirt from your shoe.

"Rivane Neuenschwander: A Day Like Any Other" continues through Sept. 19 at the New Museum, 235 Bowery, at Prince Street, Lower East Side; (212) 219-1222, newmuseum.org.

http://www.nytimes.com/2010/06/25/arts/design/25rivane.html

Emily Dickinson's New SecretLife in that Amherst house was more exciting than we knew.

By Adam KirschPosted Monday, June 28, 2010, at 7:13 AM ET



Lyndall Gordon's Lives Like Loaded GunsSeveral times a week, during the last two years of Emily Dickinson's life, a weird and symbolic drama would play itself out in the old Dickinson family house, the Homestead. At 2:30 in the afternoon, the poet's brother, Austin—a married father of three, a pillar of Amherst society, and the treasurer of Amherst College—would leave his house next door, ostensibly to pay a call on Emily and his other sister, Lavinia. In fact, he came to meet Mabel Loomis Todd, the seductive young wife of the Amherst College astronomer David Todd, and have sex with her on Emily Dickinson's dining room couch. We know exactly what happened and when, because Austin, a lawyer with good business habits, recorded everything punctually in his diary. On January 3, 1886, for instance, he wrote, "at the other house 3 to 5 and +=====XXX." Mabel, who also kept a diary, wrote rather more tenderly on the same day: "A most exquisitely happy and satisfactory two hours."

While the lovers trysted on the first floor, Emily Dickinson was up in her bedroom on the second. She must have known perfectly well what was going on. As Lyndall Gordon writes in Lives Like Loaded Guns: Emily Dickinson and Her Family's Feuds, there must have been some kind of understanding about which rooms the poet was not to enter and when for fear of getting an eyeful. But what makes the story so odd, and so characteristic of Dickinson, is that she managed to live in the same house where Todd was so unmistakably present without ever meeting her. In fact, when Emily Dickinson died, on May 15, 1886, she had never once laid eyes on Mabel Todd—the woman who tore her family apart and who would make her poetry famous.

The two women continue their wary standoff in the pages of Gordon's book, which starts out as a patchy biography of Dickinson before turning into a fascinating account of Todd's contentious role in Dickinson's

afterlife. They are so different that they almost parody the conventional distinction between the life of letters and the life of action, or what the poet called "nobody" and "somebody":

I'm Nobody! Who are you?
Are you—Nobody—too?
Then there's a pair of us?
Don't tell! they'd advertise—you know!

How dreary—to be—Somebody!
How public—like a Frog—
To tell one's name—the livelong June—
To an admiring Bog!

Mabel, born in 1856, came from a poor family, and she was determined to use her beauty and intelligence to move up in the world, to "tell her name," despite all obstacles. "There are capacities in me, I know, which I've not yet begun to feel," she wrote at the age of 21. "I shall yet do something which will be heard of—that I know." She would do many things in her life—travel around the world, become a popular lecturer, have adventurous love affairs—but as fate would have it, the "something" that made her name was to edit and publish the poems of Emily Dickinson.
Advertisement

Dickinson's fame, of course, comes in no small part from what she refused to do. She rarely left her house, and her romances exist mostly in the realm of rumor and scholarly speculation. Most mysterious of all, this author of nearly two thousand poems, including some of the greatest ever produced by an American, published just a handful of minor lyrics in her lifetime. When she died, she left behind a locked chest full of manuscripts, with many poems copied into small handmade booklets. It was Mabel Loomis Todd, more than anyone else, who was responsible for unearthing these poems, transcribing them, editing them, and seeing them into print. The unearthly genius of Dickinson needed Todd's worldly wisdom in order to win immortality.

Treating these two lives in the same book, as Gordon has tried to do, is a challenge: They resist each other on the page as they did in life. For the first half of Lives Like Loaded Guns, Gordon focuses on Emily Dickinson's story, and she puts forward one major new claim: Based on medical records and family history, and, more doubtfully, on the evidence of the poems themselves, she suggests that Dickinson was epileptic. This would explain why she preferred near-total privacy—she was afraid of other people witnessing her attacks at a time when the disease carried a stigma, especially for women. It would also explain why her family indulged her preference for staying up all night writing poems and avoiding all housework—a kind of freedom that most New England women could only dream of.

Even as she makes epilepsy a kind of key to Dickinson's mysteries, however—reading lines like "I seek the Dark/ Till I am thorough fit" as coded allusions to epileptic fits—Gordon is clearly uneasy with the very notion of using the poet's life to explain her work. Were the famous "Master Letters," in which Dickinson seems to address a lover, written to the newspaper editor Samuel Bowles, as has been speculated? Yes and no, Gordon replies: Bowles may have provided their occasion, but the letters are mainly rhetorical performances, "fertile imaginings of a potential situation that might have grown out of an initial situation we aren't meant to recover." Even when Dickinson sends Bowles an apparently erotic poem like "Two swimmers wrestled on the spar," Gordon deflects speculation: "to pursue biography is not what this poem asks us to do." True enough; but such interpretive austerity sounds odd in the context of what is, after all, a biography. It is as though

Gordon—whose previous book was a life of Mary Wollstonecraft, a major "somebody"—felt slightly ashamed of her trade in the face of Dickinson's immense reserve.

The book shifts into a higher gear once Todd comes onto the scene. She is a biographer's dream, starting with the clandestine affair with Austin Dickinson, which bloomed into a ménage-a-trois involving David Todd (and, at least once, Gordon suggests, a ménage-a-quatre, with another woman taking part). This affair was not only devastating to the Dickinson family; as Gordon shows in the most innovative part of her book, it had major repercussions for the way future generations would understand Emily Dickinson's life and work. In particular, Gordon is writing to rehabilitate the reputation of Susan Gilbert Dickinson, Austin's wife and Mabel's hated rival. Sue was Emily's trusted reader and close friend: "I chose this single star/ From out the wide night's numbers—/ Sue—forevermore!" she wrote in a poem for her sister-in-law's 28th birthday. But after the poet's death, Mabel Todd convinced Lavinia Dickinson—Emily's sister and the heir to her manuscripts—to entrust the unpublished verse to her care. This was a boon for readers, who benefited from what Gordon calls Todd's "rigorous" and "scrupulous" editing of these eccentric texts—as well as her total faith in Dickinson's genius, in the face of skepticism from editors, one of whom rejected the manuscript with the opinion that Dickinson was "generally devoid of the true poetical qualities."

But Mabel Todd's editorial control also allowed her to obliterate Sue's friendship with Emily—sometimes by literally erasing her name from documents—and turn her into a villain for Dickinson biographers, a calculating woman who married into the socially superior Dickinson family and proceeded to make Austin's life a loveless misery. The enmity between Austin's wife and mistress even passed on, like a Biblical feud, to the next generation. As late as the 1930s, Gordon shows, Mabel's daughter, Millicent Todd Bingham, and Sue's daughter, Martha Dickinson Bianchi, were publishing rival editions of Emily Dickinson's poems and slandering one another's treatment of her life. Martha's Life and Letters of Emily Dickinson created, more or less out of whole cloth, the legend of the poet's doomed love for the Reverend Charles Wadsworth, casting this alleged romance as the key to her aunt's seclusion: "Without stopping to look back, she fled to her own home for refuge—as a wild thing running," she wrote in typically purple prose. Gordon quotes the notes Millicent made in her copy of the book: "Bosh!", "ugh," "Oh yeah?" She got her own back with Ancestors' Brocades, a study in which she suggested that Dickinson's retirement was actually a way of escaping the malevolence of Sue. The all-too-human machinations of the poet's family and friends make for a good, gossipy story. But by the end of Gordon's book, we are more than ready to concede Dickinson's "public" legacy to the croaking frogs and seal ourselves up in the privacy of her poems, as she recommended:

> Reverse cannot befall
> That fine Prosperity
> Whose Sources are interior—
> As soon—Adversity
>
> A Diamond—overtake
> In far—Bolivian Ground
> Misfortune hath no implement
> Could mar it—if it found—

http://www.slate.com/id/2255272/pagenum/all/#p2

"Going to Zero"
By Peter BalakianPosted Tuesday, June 29, 2010, at 6:52 AM ET

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1.

A canvas with less turpentine, more hard edges, less bleeding,
that was good for beauty, Frankenthaler in Art News

in the dining car crammed with parkas and laptops
micro-waved cellophane, plastic plates and canvas bags,

and the valley under fog as the cows disappeared
and when the green came back into view, I could see

the SUVs floating on the Thruway, the cows oblivious
to the revved engines of trucks. The river glistened

all the way to Albany, and I could see flags on Baptist churches
and resurrection trailers, "God Bless America" on pick-ups—

"United We Stand" laminated to billboards
as the fog settled then lifted, and when I woke

a flag the size of a football field hung from the gray tower of the GW,
where the tractor-trailers jammed beneath its hem

as something sifted down on the silver-plated Hudson.
And then the lights went out.

2.

The faces on 7th Avenue blurred in the chaos of vendors and liberty
scarves, freedom ties, glowing plastic torches, dollars and polyester—

and inside Macy's I was hit by cool air as "Stars and Stripes Forever"
floated down from women's fashions into the quiet aisles of Aramis and silk scarves.

I wanted to buy the Frankenthaler, a modest, early print,
minimal, monochromatic; surface and perspective in dialogue;
on 24th off 10th –the gallery still smelled like wood and plaster—

but I didn't stop, and when the train reached the Stock Exchange
the Yom Kippur streets were quiet, and the bronze statue of Washington
was camouflaged by national guard. I was walking my old mail route now

like a drunk knocking into people, almost hit by a cab
until the roped-off streets cut me at the arm. At Broadway and Liberty

the fences wound around the bursts of dust rising

over the cranes and bulldozers, over the punched-out windows—
I stared through a piece of rusted grid that stood like a gate to the crystal river.
I was sweating in my sweatshirt now, the hood filling with soot,

as I watched with others drinking Cokes and eating their pizza of disbelief.
Zero began with the Sumerians who made circles with hollow reeds
in wet clay and baked them for posterity.

At Broadway and Liberty. At 20 floors charred and standing.
At miasma people weeping. Anna's Nail Salon, Diakichi Sushi,
the vacant shops, stripped clean in the graffiti of dust-coated windows.

Something blasted from a boom box in a music store,
something, in the ineffable clips of light,
disappeared over the river.

http://www.slate.com/id/2258515/

Bicycle Highways
Should cities build specialized roadways for cyclists?

By Tom VanderbiltPosted Wednesday, June 30, 2010, at 1:11 PM ET

In this project, "Nimble Cities," Slate wants to hear your best ideas for making urban transportation more efficient, safe, and pleasant. Read Tom Vanderbilt's explanation of Nimble Cities. You can submit your proposal here, scan all the proposals submitted by readers so far, and vote for your favorites. Over the next month, Tom Vanderbilt will evaluate the most interesting ideas and the top vote-getters.
While there have been any number of bicycle-related entries in Nimble Cities, several readers have proposed an idea that can essentially be described as "bicycle highways." "I live in Chicago and take the L to work," wrote one, "but I'd rather ride my bike. A large problem with bicycling in cities is fear, generated by the fragility of a 5-pound bicycle when faced with a 2,000-pound car. To combat this fear, cities must develop or designate roadways specifically for bikes."

Another argued that bicycle rental programs, while a good way to seed networks, were lacking: "Most people don't ride bicycles to work not because they're difficult to store/lock up but because they are at a serious disadvantage safety-wise. No bike helmet will protect you if an SUV driver on a cell phone accidentally broadsides you!"
There is hardly a major city in the world that is not trying to get more people on bikes—ridership is up in cities ranging from Paris to New York—and city planners the world over envision ever greater numbers of people on bicycles in their long-term projections. The reasons are fairly obvious: Bicycles lessen congestion while improving the health of the citizenry. Cycling moreover has begun to seem a kind of indicator of overall urban health. A recent and not atypical survey of the world's 25 most livable cities (by Monocle magazine) was stacked with Copenhagen, Munich, Stockholm, and other cities that have invested heavily in cycling; Portland, Ore., was one of two U.S. entrants. But the question of how to move cycling forward is less clear. Among the hurdles are overcoming the culture of fear that can surround urban cycling (often for good reasons) and overcoming the almost inertial political resistance to giving cycling road space at the expense (perceived or real) of cars.

But the key, one could argue, is infrastructure. While the school of so-called "vehicular cycling" argues that cycles should be treated as cars and share the roads, this philosophy seems to be the result of (primarily American) cyclists adapting by necessity to their harsh surroundings rather than the sound basis of a widespread transportation shift. In the world's top cycling cities, one finds not muscular riders harried and buffeted by passing cars, but all manner of people—young, old, carrying groceries, carrying kids—riding on networks that have been designed for them. In the Netherlands, for example, where no new road is built without a provision for cycles, cyclists ride on paths with a minimum width of 2.5 meters (which must be 1.5 meters from the road), get their own green lights, and find parking (if not always enough) at train stations and even bus stops. And even within the cycling-happy Netherlands, as David Hembrow has noted, the cities that have better infrastructure—and not necessarily the most densely populated ones—have higher cycling rates. And what's the annual cost of the world's best cycling infrastructure? By Hembrow's estimates, is roughly 30 euros for each Dutch citizen—well less than a tank of gasoline.

There have been many protracted debates in the transportation world about what sort of facilities are safest for cyclists (a picture that is complicated by the recent finding, for example, that drivers seem to drive closer to cyclists on streets with bike lanes than without). One thing that seems clear, however, is that cyclist safety tends to improve as there are more cyclists. And the best way to get more cyclists is to make them feel safer. And the way to make them feel safer is, many planners argue, to provide separate facilities. "I do believe the separate facility is the best," says Jacob Larson, a researcher at McGill University who recently completed a

study of Montreal's bicycle infrastructure. "Not only in terms of actual safety performance but in terms of encouraging people who are less likely to ride their bikes. These people shouldn't have to be some kind of breakneck radicals that are really diehards—it should be a clear and safe option, and I think separate facilities give the perception that it is, and often do provide a truly safer alternative."

And while the words bicycle highway might conjure something like this image of a rather pathetic bike lane along a high speed motorway in the United Kingdom, those two words used together are actually gaining a certain currency. In Denmark, for example, the city of Copenhagen is extending its bicycling network outward into the suburbs, creating what the blog Copenhagenize calls "bicycle superhighways," for commutes of 10 kilometers or more, with everything from "green wave" lights (cycle 20 kilometers to hit all green) to standardized signage to bicycle service stations along the way. In London, Mayor Boris Johnson's own network of a dozen cycling "superhighways" (like football's Premiere League, they are sponsored by Barclays) is taking root; it "will provide cyclists with safe, direct, continuous, well marked and easily navigable routes along recognised commuter corridors." Johnson has been criticized, however, by cyclists who say the "superhighways" are just new-model bike lanes, too narrow and too frequently encroached upon by cars (and clearly there are some parts of the network that will have to be fixed). But as the engineering firm Colin Buchanan points out, the Netherlands didn't get its extensive network of separated bicycle facilities overnight—it took decades—and the volume of protest in London may itself be sign of an ascendant cycling culture; i.e., the debate has moved on, as it unfortunately has not in many U.S. cities, from the question of whether there should be bicycle facilities in the first place to the qualities of those facilities.

Even in the United States, however, the idea that there might be entire roads that are prioritized for bicycle use is slowly moving into the mainstream. Take, for instance, so-called "bicycle boulevards" (see here for a short video summary) which are described by Portland State University's Center for Transportation Studies as "low-volume and low-speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. These treatments allow through movements for cyclists while discouraging similar through trips by nonlocal motorized traffic." The idea, inspired by the German Fahrradstraße or the Dutch Fietstraten, is to turn roads into de facto bike paths, shared with the occasional local car.

Not surprisingly, it's Portland—which may spend $600 million on bicycle infrastructure over the next 20 years, with a goal of upping the cycling rate to 25 percent of all trips by 2030—that has most energetically taken on the bicycle boulevard concept, even piggybacking bicycle-friendly traffic-calming measures onto storm-water runoff treatments in its "green streets" program. But any number of other cities are moving ahead with bicycle boulevards, from Austin, Texas, (David Bryne wrote an accompanying theme for that city's plan) to Minneapolis to Wilmington, N.C. In Rochester, N.Y., residents of the Upper Monroe neighborhood recently did a demonstration ride ("just ordinary folks finding out what a bicycle boulevard would look and feel like in our area") of projected bicycle boulevard routes, emphasizing key points: Boulevards need to lead to things, like shopping districts or other bike networks, and bicycle boulevards need to stretch across neighborhoods—so community involvement is essential.

One sometimes hears, in critiques of bringing bicycling in a bigger way to American cities, something along the lines of "that might work in Europe, but it will never work here." But the preponderance of cycling didn't just happen in Amsterdam or anywhere else—it was the result of a politically nonexpedient, concerted effort. Now, that refrain has often shifted to something like, "Well, that might work in Portland, but it wouldn't work in a city like (insert your city here)." Who knows where it won't work next?

http://www.slate.com/id/2258675/pagenum/all/#p2

Discovering the Virtues of a Wandering Mind
By JOHN TIERNEY

At long last, the doodling daydreamer is getting some respect.

In the past, daydreaming was often considered a failure of mental discipline, or worse. Freud labeled it infantile and neurotic. Psychology textbooks warned it could lead to psychosis. Neuroscientists complained that the rogue bursts of activity on brain scans kept interfering with their studies of more important mental functions.

But now that researchers have been analyzing those stray thoughts, they've found daydreaming to be remarkably common — and often quite useful. A wandering mind can protect you from immediate perils and keep you on course toward long-term goals. Sometimes daydreaming is counterproductive, but sometimes it fosters creativity and helps you solve problems.

Consider, for instance, these three words: eye, gown, basket. Can you think of another word that relates to all three? If not, don't worry for now. By the time we get back to discussing the scientific significance of this puzzle, the answer might occur to you through the "incubation effect" as your mind wanders from the text of this article — and, yes, your mind is probably going to wander, no matter how brilliant the rest of this column is.

Mind wandering, as psychologists define it, is a subcategory of daydreaming, which is the broad term for all stray thoughts and fantasies, including those moments you deliberately set aside to imagine yourself winning the lottery or accepting the Nobel. But when you're trying to accomplish one thing and lapse into "task-unrelated thoughts," that's mind wandering.

During waking hours, people's minds seem to wander about 30 percent of the time, according to estimates by psychologists who have interrupted people throughout the day to ask what they're thinking. If you're driving down a straight, empty highway, your mind might be wandering three-quarters of the time, according to two of the leading researchers, Jonathan Schooler and Jonathan Smallwood of the University of California, Santa Barbara.

"People assume mind wandering is a bad thing, but if we couldn't do it during a boring task, life would be horrible," Dr. Smallwood says. "Imagine if you couldn't escape mentally from a traffic jam."

You'd be stuck contemplating the mass of idling cars, a mental exercise that is much less pleasant than dreaming about a beach and much less useful than mulling what to do once you get off the road. There's an evolutionary advantage to the brain's system of mind wandering, says Eric Klinger, a psychologist at the University of Minnesota and one of the pioneers of the field.

"While a person is occupied with one task, this system keeps the individual's larger agenda fresher in mind," Dr. Klinger writes in the "Handbook of Imagination and Mental Simulation". "It thus serves as a kind of

reminder mechanism, thereby increasing the likelihood that the other goal pursuits will remain intact and not get lost in the shuffle of pursuing many goals."

Of course, it's often hard to know which agenda is most evolutionarily adaptive at any moment. If, during a professor's lecture, students start checking out peers of the opposite sex sitting nearby, are their brains missing out on vital knowledge or working on the more important agenda of finding a mate? Depends on the lecture.

But mind wandering clearly seems to be a dubious strategy, if, for example, you're tailgating a driver who suddenly brakes. Or, to cite activities that have actually been studied in the laboratory, when you're sitting by yourself reading "War and Peace" or "Sense and Sensibility."

If your mind is elsewhere while your eyes are scanning Tolstoy's or Austen's words, you're wasting your own time. You'd be better off putting down the book and doing something more enjoyable or productive than "mindless reading," as researchers call it.

Yet when people sit down in a laboratory with nothing on the agenda except to read a novel and report whenever their mind wanders, in the course of a half hour they typically report one to three episodes. And those are just the lapses they themselves notice, thanks to their wandering brains being in a state of "meta-awareness," as it's called by Dr. Schooler,

He, and other researchers have also studied the many other occasions when readers aren't aware of their own wandering minds, a condition known in the psychological literature as "zoning out." (For once, a good bit of technical jargon.) When experimenters sporadically interrupted people reading to ask if their minds were on the text at that moment, about 10 percent of the time people replied that their thoughts were elsewhere — but they hadn't been aware of the wandering until being asked about it.

"It's daunting to think that we're slipping in and out so frequently and we never notice that we were gone," Dr. Schooler says. "We have this intuition that the one thing we should know is what's going on in our minds: I think, therefore I am. It's the last bastion of what we know, and yet we don't even know that so well."

The frequency of zoning out more than doubled in reading experiments involving smokers who craved a cigarette and in people who were given a vodka cocktail before taking on "War and Peace." Besides increasing the amount of mind wandering, the people made alcohol less likely to notice when their minds wandered from Tolstoy's text.

In another reading experiment, researchers mangled a series of consecutive sentences by switching the position of two of nouns in each one — the way that "alcohol" and "people" were switched in the last sentence of the previous paragraph. In the laboratory experiment, even though the readers were told to look for sections of gibberish somewhere in the story, only half of them spotted it right away. The rest typically read right through the first mangled sentence and kept going through several more before noticing anything amiss.

To measure mind wandering more directly, Dr. Schooler and two psychologists at the University of Pittsburgh, Erik D. Reichle and Andrew Reineberg, used a machine that tracked the movements of people's eyes while reading "Sense and Sensibility" on a computer screen. It's probably just as well that Jane Austen is not around to see the experiment's results, which are to appear in a forthcoming issue of Psychological Science.

By comparing the eye movements with the prose on the screen, the experimenters could tell if someone was slowing to understand complex phrases or simply scanning without comprehension. They found that when people's mind wandered, the episode could last as long as two minutes.

Where exactly does the mind go during those moments? By observing people at rest during brain scans, neuroscientists have identified a "default network" that is active when people's minds are especially free to wander. When people do take up a task, the brain's executive network lights up to issue commands, and the default network is often suppressed.

But during some episodes of mind wandering, both networks are firing simultaneously, according to a study led by Kalina Christoff of the University of British Columbia. Why both networks are active is up for debate. One school theorizes that the executive network is working to control the stray thoughts and put the mind back on task.

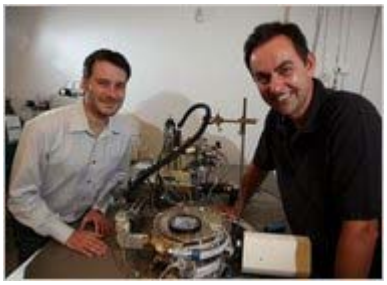
Another school of psychologists, which includes the Santa Barbara researchers, theorizes that both networks are working on agendas beyond the immediate task. That theory could help explain why studies have found that people prone to mind wandering also score higher on tests of creativity, like the word-association puzzle mentioned earlier. Perhaps, by putting both of the brain networks to work simultaneously, these people are more likely to realize that the word that relates to eye, gown and basket is ball, as in eyeball, ball gown and basketball.

To encourage this creative process, Dr. Schooler says, it may help if you go jogging, take a walk, do some knitting or just sit around doodling, because relatively undemanding tasks seem to free your mind to wander productively. But you also want to be able to catch yourself at the Eureka moment.

"For creativity you need your mind to wander," Dr. Schooler says, "but you also need to be able to notice that you're mind wandering and catch the idea when you have it. If Archimedes had come up with a solution in the bathtub but didn't notice he'd had the idea, what good would it have done him?"

http://www.nytimes.com/2010/06/29/science/29tier.html?_r=1&ref=science

Team's Work Uses a Virus to Convert Methane to Ethylene



By JOHN MARKOFF

SAN FRANCISCO — A team of molecular biologists and materials scientists said Monday they had genetically engineered a virus to convert methane to ethylene more efficiently and at a significantly lower temperature than previously possible.

If they are successful in commercializing the new material, it will herald the arrival of a set of new technologies that represents a synthesis of molecular biology and industrial chemistry.

Ethylene, a gas with a characteristic sweet smell that may have once given insights to the Oracle of Delphi, is widely used in the manufacturing of plastics, solvents and fibers, and is essential for an array of consumer and industrial products. But it is still produced by steam cracking, a high-temperature, energy-intensive and expensive industrial process first developed in the 19th century. In this process, hydrocarbons found in crude oil are broken down into a range of simpler chemical compounds.

The search for more efficient, less expensive approaches to the production of ethylene has gone on for more than three decades, and although some progress has been made no new techniques have yet proved commercially viable.

Now a small group of researchers at Siluria Technologies, a Silicon Valley startup based here, are reporting progress in commercializing a nanoscience-based approach to ethylene production.

Their technique for producing ethylene depends on the ability of a genetically engineered virus to coat itself with a metal that serves as a catalyst for an ethylene producing chemical reaction. The key is that the virus can create a "tangle of catalyst coated nanowires — the researchers call it a hairball — that provide so much surface area for chemical reactions to occur that the energy needed to produce the reactions is much reduced.

The basic process, or chemical reaction, known as oxidative coupling of methane, was an area of intense research for the petrochemical industry beginning in the late 1980s. Researchers had some success but never achieved enough of an improvement in energy efficiency to justify displacing the traditional steam-cracking process.

With its hairballs of virus-created nanowires coated with unspecified metals , Siluria has been able to create ethylene-producing reactions at temperatures 200 to 300 degrees lower than previously achieved, said Erik Scher, a chemist who is one of the company's researchers. The company won't say specifically what the coating is, but say that magnesium oxide is an example of the kind of metals involved.

The work is based on a technique for genetically engineering viruses pioneered by Angela Belcher, who leads the Biomolecular Materials Group at M.I.T. The technique involves manipulating the genes of a virus, in this

case one that usually attacks bacteria, so that it will collect and coat itself with inorganic materials, like metals and even carbon nanotubes.

The viruses can be used to create a dense tangle of metal nanowires, and the potential applications for these engineered materials are remarkably diverse. Dr. Belcher's lab is busy with research on more efficient batteries and solar cells, biofuels, hydrogen separation and other fuel cell technologies, CO2 sequestration, cancer diagnostic and therapeutic approaches, as well as an effort to create a catalyst that can convert ethanol to hydrogen at room temperature.

Last year the laboratory published a paper in the journal Science that described using a virus to synthesize nanowires of cobalt oxide at room temperature to improve the capacity of thin, flexible lithium ion batteries. In April the M.I.T. researchers engineered a virus to mimic photosynthesis and produce hydrogen at room temperature by separating water molecules.

Dr. Belcher said her goal had not been commercialization of the potential new technologies she had designed. "We think, 'What is the problem that needs to be solved?' and that is where we head," she said.

In contrast, the Siluria researchers said their advance in developing catalysts is the most significant step yet toward commercialization of the bacteriophage technique.

"We are learning from nature, but going to new places in the periodic table and working with the same tools and techniques to use materials that nature has not worked with," said Alex Tkachenko, a molecular biologist who is a co-founder of Siluria.

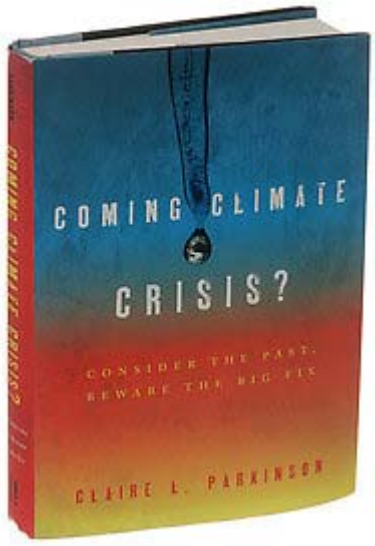
"What is different now," said Dr. Tkachenko, "is that Angie's biosynthetic technology allows us to grow these catalysts in a bottom-up synthetic way into novel shapes — nanowires — which in turn, allow us to create unique surface morphologies."

The researchers acknowledged that they do not yet have a complete scientific understanding of the surface behavior of their new catalyst.

"These are the next generations that will evolve into materials and systems, that we can't even imagine right now," said Mehmet Sarikaya, director of the Genetically Engineered Materials Science and Engineering Center at the University of Washington. Dr. Sarikaya's lab is performing similar research in designing materials like smaller proteins and peptides, that can mimic biological processes.

http://www.nytimes.com/2010/06/29/science/29ethyl.html?ref=science

When the Day After Tomorrow Has Come
By CORNELIA DEAN



Imagine that it is 2050 — or even 2020 — and you are the president. Your science adviser has brought you alarming news: Greenland's inland ice sheets are melting so fast that sea levels are about to rise dramatically. Moreover, thawing Arctic permafrost is about to pour huge quantities of heat-trapping methane gas into the atmosphere, which will make the already roasting planet even hotter.

The crisis, your adviser tells you, is now.

What can you do?

Quite a bit, to hear some researchers tell it. They say it should be possible to "geoengineer" the planet to cool its increasingly raging greenhouse fever. But they say these possibilities must be tested now, so that when the world needs to act, the scientific community can offer responsible advice. Their ideas are the subject of a new book, "Hack the Planet," by Eli Kintisch, a reporter for the journal Science.

Mr. Kintisch begins by describing a two-day meeting organized to discuss the ideas, held in 2007 in Cambridge, Mass. The meeting, under the auspices of the American Academy of Arts and Sciences and Harvard University, brought together researchers who have been thinking about these ideas for years — some with enthusiasm, some with alarm.

Geoengineering is generally defined as the application of engineering techniques to alter the planet as a whole. As far as climate is concerned proposals fall into two groups.

The first involves removing carbon from the atmosphere by, say, fertilizing oceans with iron, to encourage the growth of plankton or algae. In theory, the plankton would absorb the carbon and, when they die, take it with them as they sink to the ocean floor. (As Mr. Kintisch relates, private groups have already experimented with this technique, in hopes of eventually selling credits to buyers eager to offset carbon emissions.)

The second approach involves reflecting solar radiation back into space by, say, spraying sulfate aerosols into the atmosphere to make the Earth, in effect, shinier.

But, as Mr. Kintisch relates, these remedies are not necessarily simple and even their easy-to-envision consequences can be alarming. For example, encouraging plankton growth would encourage the growth of the creatures that feed on plankton, potentially disrupting the ocean food web. Sulfates in the atmosphere might disrupt rainfall in some areas, causing droughts.

And then, of course, there are the "unknown unknowns," things we won't even know we need to worry about until it is too late.

Plus, once some of these remedies are in place, they must be maintained indefinitely. Injecting sulfates into the atmosphere won't stop carbon dioxide and other greenhouse gases from accumulating there. So if the project is abandoned, Earth won't revert to its earlier temperatures. Instead, the intervening accumulation of atmospheric carbon could cause temperatures to zoom calamitously, virtually at once.

Also, of course, there is more to climate change than heat — and engineering Earth's temperature will do nothing to reduce problems like changing chemistry in the oceans, which are acidifying as their carbon dioxide levels rise.

For some, the most worrisome thing about geoengineering is the idea that, once people know about it, they will think of it as a technological quick fix that makes it unnecessary to control emissions of greenhouse gases, an effort everyone takes pains to point out is by far the most important step to be taken now.

Still, if geoengineering is not yet an idea whose time has come, it is definitely gaining traction. It is discussed in two other new books, "Fixing the Sky: The Checkered History of Weather and Climate Control," by James Rodger Fleming, a professor of science, technology and society at Colby College, and "Coming Climate Crisis? Consider the Past, Beware the Big Fix," by Claire L. Parkinson, a NASA scientist whose specialty is polar sea ice and a forthcoming book, "The Climate Fix," by Roger Pielke Jr., a professor of environmental studies at the University of Colorado.

For Dr. Fleming, whose book is a scholarly look at the history of weather modification and similar efforts, geoengineering proposals are "untested, untestable and dangerous beyond belief." He fits them neatly into what he calls "a long tradition of imaginative and speculative literature involving the 'control' of nature." But, as he notes, the ideas have drawn favor especially among conservatives and libertarians who look for technological rather than regulatory solutions for climate change.

Dr. Parkinson, whose book deals largely with the evidence that human actions are altering climates, notes that "good intentions do not necessarily lead to good results." So far, she writes, humanity's record of environmental manipulation does not inspire confidence.

In his discussion of geoengineering in "The Climate Fix," Dr. Pielke argues that research into geoengineering techniques could advance scientists' understanding of the action of Earth's climate. But if the techniques are put into effect, "unintended consequences are certain," he writes, adding "there is no practice planet earth on which such technologies can be implemented, evaluated, and improved."

His book will be published in the fall.

Mr. Kintisch makes the same point, in a way, beginning many of his chapters with tales of well-meaning efforts gone awry (species brought in to control pests that themselves become pests, irrigation projects that end up poisoning the soil and so on).

In March many of the participants in the Cambridge meeting joined other researchers at the Asilomar Conference Grounds in Pacific Grove, Calif., famed as the site of a 1975 meeting where biologists and others struck by the emerging power of DNA technology began work that eventually led to regulation of the work.

But if participants in this year's meeting hoped to do the same for geoengineering, they must be disappointed. Perhaps it is too soon to expect results especially since, in their own way, the technical issues surrounding geoengineering are at least as complex than those surrounding DNA. And the stakes are at least as high.

Meanwhile, there has been relatively little discussion so far about who would make geoengineering decisions — would the world accept an American president in charge of the decision to go ahead? Assuming we could tune the Earth to a desirable temperature, who would say what that temperature would be? What side effects would be acceptable? Who would be compensated for suffering them. And so on.

I attended the Cambridge meeting Mr. Kintisch describes at the beginning of his book. Afterward, I talked to participants about what it would take to devise and implement any geoengineering plan the world's wildly diverse people and governments might buy into. And who would regulate it or police any "rogue state," nonprofit or commercial venture ready to act on its own?

Participants I spoke with were at a loss. "World government," one of them, finally, offered. The answer does not inspire confidence either.

All the while, humanity is already engaged in a gigantic geoengineering experiment, one that has been under way, however inadvertently, since people started large-scale burning of fossil fuels 150 years ago. So far, the world's efforts to act together on the problem have been, to be charitable, unimpressive.

The lesson, as all three authors put it, might therefore lie not in figuring out how to "hack the planet" but rather to change things so that planetary hacking will not be needed at all.

http://www.nytimes.com/2010/06/29/science/29scibks.html?ref=science

Computers Learn to Listen, and Some Talk Back

By STEVE LOHR and JOHN MARKOFF

"Hi, thanks for coming," the medical assistant says, greeting a mother with her 5-year-old son. "Are you here for your child or yourself?"

The boy, the mother replies. He has diarrhea.

"Oh no, sorry to hear that," she says, looking down at the boy.

The assistant asks the mother about other symptoms, including fever ("slight") and abdominal pain ("He hasn't been complaining").

She turns again to the boy. "Has your tummy been hurting?" Yes, he replies.

After a few more questions, the assistant declares herself "not that concerned at this point." She schedules an appointment with a doctor in a couple of days. The mother leads her son from the room, holding his hand. But he keeps looking back at the assistant, fascinated, as if reluctant to leave.

Maybe that is because the assistant is the disembodied likeness of a woman's face on a computer screen — a no-frills avatar. Her words of sympathy are jerky, flat and mechanical. But she has the right stuff — the ability to understand speech, recognize pediatric conditions and reason according to simple rules — to make an initial diagnosis of a childhood ailment and its seriousness. And to win the trust of a little boy.

"Our young children and grandchildren will think it is completely natural to talk to machines that look at them and understand them," said Eric Horvitz, a computer scientist at Microsoft's research laboratory who led the medical avatar project, one of several intended to show how people and computers may communicate before long.

For decades, computer scientists have been pursuing artificial intelligence — the use of computers to simulate human thinking. But in recent years, rapid progress has been made in machines that can listen, speak, see, reason and learn, in their way. The prospect, according to scientists and economists, is not only that artificial intelligence will transform the way humans and machines communicate and collaborate, but will also eliminate millions of jobs, create many others and change the nature of work and daily routines.

The artificial intelligence technology that has moved furthest into the mainstream is computer understanding of what humans are saying. People increasingly talk to their cellphones to find things, instead of typing. Both Google's and Microsoft's search services now respond to voice commands. More drivers are asking their cars to do things like find directions or play music.

The number of American doctors using speech software to record and transcribe accounts of patient visits and treatments has more than tripled in the past three years to 150,000. The progress is striking. A few years ago, supraspinatus (a rotator cuff muscle) got translated as "fish banana." Today, the software transcribes all kinds of medical terminology letter perfect, doctors say. It has more trouble with other words and grammar, requiring wording changes in about one of every four sentences, doctors say.

"It's unbelievably better than it was five years ago," said Dr. Michael A. Lee, a pediatrician in Norwood, Mass., who now routinely uses transcription software. "But it struggles with 'she' and 'he,' for some reason. When I say 'she,' it writes 'he.' The technology is sexist. It likes to write 'he.' "

Meanwhile, translation software being tested by the Defense Advanced Research Projects Agency is fast enough to keep up with some simple conversations. With some troops in Iraq, English is translated to Arabic and Arabic to English. But there is still a long way to go. When a soldier asked a civilian, "What are you transporting in your truck?" the Arabic reply was that the truck was "carrying tomatoes." But the English translation became "pregnant tomatoes." The speech software understood "carrying," but not the context.

Yet if far from perfect, speech recognition software is good enough to be useful in more ways all the time. Take call centers. Today, voice software enables many calls to be automated entirely. And more advanced systems can understand even a perplexed, rambling customer with a misbehaving product well enough to route the caller to someone trained in that product, saving time and frustration for the customer. They can detect anger in a caller's voice and respond accordingly — usually by routing the call to a manager.

So the outlook is uncertain for many of the estimated four million workers in American call centers or the nation's 100,000 medical transcriptionists, whose jobs were already threatened by outsourcing abroad. "Basic work that can be automated is in the bull's-eye of both technology and globalization, and the rise of artificial intelligence just magnifies that reality," said Erik Brynjolfsson, an economist at the Sloan School of Management at the Massachusetts Institute of Technology.

Still, Mr. Brynjolfsson says artificial intelligence will also spur innovation and create opportunities, both for individuals and entrepreneurial companies, just as the Internet has led to new businesses like Google and new forms of communication like blogs and social networking. Smart machines, experts predict, will someday tutor students, assist surgeons and safely drive cars.

The Digital Assistant

"Hi, are you looking for Eric?" asks the receptionist outside the office of Eric Horvitz at Microsoft.

This assistant is an avatar, a time manager for office workers. Behind the female face on the screen is an arsenal of computing technology including speech understanding, image recognition and machine learning. The digital assistant taps databases that include the boss's calendar of meetings and appointments going back years, and his work patterns. Its software monitors his phone calls by length, person spoken to, time of day and day of the week. It also tracks his location and computer use by applications used — e-mail, writing documents, browsing the Web — for how long and time of day.

When a colleague asks when Mr. Horvitz's meeting or phone call may be over, the avatar reviews that data looking for patterns — for example, how long have calls to this person typically lasted, at similar times of day and days of the week, when Mr. Horvitz was also browsing the Web while talking? "He should be free in five or six minutes," the avatar decides.

The avatar has a database of all the boss's colleagues at work and relationships, from research team members to senior management, and it can schedule meetings. Mr. Horvitz has given the avatar rules for the kinds of meetings that are more and less interruptible. A session with a research peer, requiring deep concentration, may be scored as less interruptible than a meeting with a senior executive. "It's O.K. to interrupt him," the assistant tells a visitor. "Just go in."

As part of the project, the researchers plan to program the avatar to engage in "work-related chitchat" with colleagues who are waiting.

The conversation could be about the boss's day: "Eric's been in back-to-back meetings this afternoon. But he's looking forward to seeing you." Or work done with the boss: "Yes, you were in the big quarterly review with Eric last month." Or even a local team: "How about that Mariners game last night?"

Mr. Horvitz shares a human administrative assistant with other senior scientists. The avatar's face is modeled after her. At Microsoft, workers typically handle their own calendars. So the main benefit of the personal assistant, Mr. Horvitz says, is to manage his time better and coordinate his work with colleagues'. "I think of it as an extension of me," he said. "The result is a broader, more effective Eric."

Computers with artificial intelligence can be thought of as the machine equivalent of idiot savants. They can be extremely good at skills that challenge the smartest humans, playing chess like a grandmaster or answering "Jeopardy!" questions like a champion. Yet those skills are in narrow domains of knowledge. What is far harder for a computer is common-sense skills like understanding the context of language and social situations when talking — taking turns in conversation, for example.

The scheduling assistant can plumb vast data vaults in a fraction of a second to find a pattern, but a few unfamiliar words leave it baffled. Jokes, irony and sarcasm do not compute.

That brittleness can lead to mistakes. In the case of the office assistant, it might be a meeting missed or a scheduling mix-up. But the medical assistant could make more serious mistakes, like an incorrect diagnosis or a seriously ill child sent home.

The Microsoft projects are only research initiatives, but they suggest where things are headed. And as speech recognition and other artificial intelligence technologies take on more tasks, there are concerns about the social impact of the technology and too little attention paid to its limitations.

Smart machines, some warn, could be used as tools to isolate corporations, government and the affluent from the rest of society. Instead of people listening to restive customers and citizens, they say, it will be machines.

“Robot voices could be the perfect wall to protect institutions that don’t want to deal with complaints,” said Jaron Lanier, a computer scientist and author of “You Are Not a Gadget” (Knopf, 2010).

Smarter Devices

“I’m looking for a reservation for two people tomorrow night at 8 at a romantic restaurant within walking distance.”

That spoken request seems simple enough, but for a computer to respond intelligently requires a ballet of more than a dozen technologies.

A host of companies — AT&T, Microsoft, Google and startups — are investing in services that hint at the concept of machines that can act on spoken commands. They go well beyond voice-enabled Internet search.

Perhaps the furthest along is Siri, a Silicon Valley company offering a “virtual personal assistant,” a collection of software programs that can listen to a request, find information and take action.

In this case, Siri, presented as an iPhone application, sends the spoken request for a romantic restaurant as an audio file to computers operated by Nuance Communications, the largest speech-recognition company, which convert it to text. The text is then returned to Siri’s computers, which make educated guesses about the meaning.

“It’s a bit like the task faced by a waiter for whom English is a second language in a noisy restaurant,” said Tom Gruber, an artificial intelligence researcher and co-founder of Siri. “It isn’t perfect, but in context the waiter can usually figure out what you want.”

The Siri system taps more data to decide if it is seeking a romantic restaurant or romantic comedy. It knows the location of the phone and has rules for the meaning of phrases like “within walking distance.” It scans online restaurant review services like Yelp and Gayot for “romantic.”

Siri takes the winnowed list of restaurants, contacts the online reservation service Open Table and gets matches for those with tables available at 8 the next day. Those restaurants are then displayed on the user’s phone, and the reservation can be completed by tapping a button on the screen. The elaborate digital dance can be completed in a few seconds — when it works.

Apple is so impressed that it bought Siri in April in a private transaction estimated at more than $200 million.

Nelson Walters, an MTV television producer in New York, is a Siri fan. It saves him time and impresses his girlfriend. “I will no longer get lost in searching Yelp for restaurant recommendations,” he said. But occasionally, Mr. Walters said, Siri stumbles. Recently, he asked Siri for the location of a sushi restaurant he knew. Siri replied with directions to an Asian escort service. “I swear that’s not what I was looking for,” he said.

Mr. Gruber said Siri had heard an unfamiliar Japanese word, but did not know the context and guessed wrong.

In cars, too, speech recognition systems have vastly improved. In just three years, the Ford Motor Company, using Nuance software, has increased the number of speech commands its vehicles recognize from 100 words to 10,000 words and phrases.

Systems like Ford's Sync are becoming popular options in new cars. They are also seen by some safety specialists as a defense, if imperfect, against the distracting array of small screens for GPS devices, smartphones and the like.

Later this summer, a new model of the Ford Edge will recognize complete addresses, including city and state spoken in a single phrase, and respond by offering turn-by-turn directions.

To the Customer's Rescue

"Please select one of the following products from our menu," the electronics giant Panasonic used to tell callers seeking help with products from power tools to plasma televisions.

It was not working. Callers took an average of 2 1/2 minutes merely to wade through the menu, and 40 percent hung up in frustration. "We were drowning in calls," recalled Donald Szczepaniak, vice president of customer service. Panasonic reached out to AT&T Labs in 2005 for help.

The AT&T researchers worked with thousands of hours of recorded calls to the Panasonic center, in Chesapeake, Va., to build statistical models of words and phrases that callers used to describe products and problems, and to create a database that is constantly updated. "It's a baby, and the more data you give it, the smarter it becomes," said Mazin Gilbert, a speech technology expert at AT&T Labs.

The goal of the system is to identify key words — among a person's spoken phrases and sentences — so an automated assistant can intelligently reply.

"How may I help you?" asked the automated female voice in one recording.

"I was watching 'American Idol' with my dog on Channel 5," a distraught woman on the line said recently, "and suddenly my TV was stuck in Spanish."

"What kind of TV?" the automated assistant asked, suggesting choices that include plasma, LCD and others.

"LCD," replied the woman, and her call was sent to an agent trained in solving problems with LCD models.

Simple problems — like product registration or where to take a product for repairs — can be resolved in the automated system alone. That technology has improved, but callers have also become more comfortable speaking to the system. A surprising number sign off by saying, "Thank you."

Some callers, especially younger ones, also make things easier for the computer by uttering a key phrase like "plasma help," Mr. Szczepaniak said. "I call it the Google-ization of the customer," he said.

Over all, half of the calls to Panasonic are handled in the automated system, up from 10 percent five years ago, estimated Lorraine Robbins, a manager.

But the other half of calls are more complex problems — like connecting a digital television to a cable box. In those cases, the speech recognition system quickly routes a call to an agent trained on the product, so far more problems are resolved with a single call. Today, Panasonic resolves one million more customer problems a year with 1.6 million fewer total calls than five years ago. The cost of resolving a customer issue has declined by 50 percent.

The speech technology's automated problem sorting has enabled Panasonic to globalize its customer service, with inquiries about older and simpler products routed to its call centers in the Philippines and Jamaica. The Virginia center now focuses on high-end Panasonic products like plasma TVs and home theater equipment. And while the center's head count at 200 is the same as five years ago, the workers are more skilled these days. Those who have stayed have often been retrained.

Antoine Andujar, a call center agent for more than five years, attended electronics courses taught at the call center by instructors from a local community college. He used to handle many products, but now specializes in issues with plasma and LCD televisions.

Mr. Andujar completed his electronics certification program last year, and continues to study. "You have to move up in skills," he said. "At this point, you have to be certified in electronics to get in the door here as a Panasonic employee."

The Efficient Listener

"This call may be recorded for quality assurance purposes."

But at a growing number of consumer call centers, technical support desks and company hot lines, the listener is a computer. One that can recognize not only words but also emotions — and listen for trends in customer complaints.

In the telephone industry, for example, companies use speech recognition software to provide an early warning about changes in a competitor's calling plans. By detecting the frequent use of names like AT&T and other carriers, the software can alert the company to a rival that lowered prices, for example, far faster than would hundreds of customer service agents. The companies then have their customer agents make counteroffers to callers thinking of canceling service.

Similar software, used by Aetna, began to notice the phrase "cash for clunkers" in hundreds of calls to its call center one weekend last year. It turned out that tens of thousands of car shoppers responding to the government incentive were calling for insurance quotes. Aetna created insurance offers for those particular callers and added workers to handle the volume.

And as Apple's new smartphone surged in popularity several years ago, GoDaddy, an Internet services company, learned from its call-monitoring software that callers did not know how to use GoDaddy on their iPhones. The company rushed to retrain its agents to respond to the calls and pushed out an application allowing its users to control its service directly from the iPhone.

Certain emotions are now routinely detected at many call centers, by recognizing specific words or phrases, or by detecting other attributes in conversations. Voicesense, an Israeli developer of speech analysis software, has algorithms that measure a dozen indicators, including breathing, conversation pace and tone, to warn agents and supervisors that callers have become upset or volatile.

The real issue with artificial intelligence, as with any technology, is how it will be used. Automation is a remarkable tool of efficiency and convenience. Using an A.T.M. to make cash deposits and withdrawals beats standing in line to wait for a teller. If an automated voice system in a call center can answer a question, the machine is a better solution than lingering on hold for a customer service agent.

Indeed, the increasing usefulness of artificial intelligence — answering questions, completing simple tasks and assisting professionals — means the technology will spread, despite the risks. It will be up to people to guide how it is used.

“It’s not human intelligence, but it’s getting to be very good machine intelligence,” said Andries van Dam, a professor of computer science at Brown University. “There are going to be all sorts of errors and problems, and you need human checks and balances, but having artificial intelligence is way better than not having it.”

http://www.nytimes.com/2010/06/25/science/25voice.html?ref=science

From M.S. Patients, Outcry for Unproved Treatment

By DENISE GRADY

For her first appointment with Dr. Daniel Simon, Neelima Raval showed up with a rolling file cabinet full of documents. She had downloaded every word written by or about Dr. Paolo Zamboni, a vascular surgeon from Italy with a most unorthodox theory about multiple sclerosis.

Dr. Zamboni believes that the disease, which damages the nervous system, may be caused by narrowed veins in the neck and chest that block the drainage of blood from the brain. He has reported in medical journals that opening those veins with the kind of balloons used to treat blocked heart arteries—an experimental treatment he calls the “liberation procedure”— can relieve symptoms.

The idea is a radical departure from the conventional belief that multiple sclerosis is caused by a malfunctioning immune system and inflammation.

The new theory has taken off on the Internet, inspiring hope among patients, interest from some researchers and scorn from others. Supporters consider it an outside-the-box idea that could transform the treatment of the disease. Critics call it an outlandish notion that will probably waste time and money, and may harm patients.

These critics warn that multiple sclerosis has unpredictable attacks and remissions that make it devilishly hard to know whether treatments are working — leaving patients vulnerable to purported “cures” that do not work.

The controversy has exposed the deep frustration of many people with this incurable, disabling disease, who feel that research has let them down. It is a case study in the power of the Internet to inform and unite angry patients—which may be a double-edged sword. Pressure from activists helped persuade the Multiple Sclerosis

Society to pay for studies of Dr. Zamboni's theory, but the Internet buzz has also created an avid market for a therapy that is still unproved.

"It's eye-opening the way this group of patients has grabbed hold of the social-networking technology," said Dr. Simon, an interventional radiologist at JFK Medical Center in Edison, N.J. "They've taken this to a level I've not seen in other patients. Patients used to read an article or two. Now, they're actually seeing procedures on YouTube. Is this the future of medicine?"

Scientifically, the jury is out: Dr. Zamboni's hypothesis is being studied. It is not known whether narrowed veins are more common in people with multiple sclerosis than in others, and even if they are, whether the narrowings are a cause, or an effect, of the disease. There is no solid proof that opening the veins can help. There have been no studies with control groups — the only way to find out whether a treatment works.

"In my view the evidence is quite scanty and the biological plausibility is low," said Dr. Stephen L. Hauser, the chairman of neurology at the University of California, San Francisco. Many neurologists agree. Dr. Hauser said there was much stronger evidence that the disease arose from genetic variations affecting the immune system.

But Dr. Adnan H. Siddiqui, part of a team at the University at Buffalo that has been studying Dr. Zamboni's theory, said that it made sense and that the data from Italy was encouraging. Still, he emphasized that more study was needed, and that patients should not be treated until the research was done.

In Demand

Despite the lack of proof, many patients are captivated by the idea that multiple sclerosis might turn out to be a vascular disease. They want to believe it can fixed with a relatively simply procedure, and they want to be tested and treated. Now.

These patients say they cannot afford to wait for research results because they will wind up in wheelchairs before the studies are done. Their only option so far has been a lifelong course of drugs with limited benefits and harsh side effects. To some, balloon treatment seems no riskier than those drugs.

Dr. Zamboni himself has said that the procedure should not yet be done outside of studies. He said in an interview that he was conducting research only and had turned down thousands of requests from people wanting to go to his clinic at the University of Ferrara.

But other doctors have set up shop. A clinic in India with a toll-free American phone number has an online advertisement for a "liberation package." Patients are posting testimonial videos and trading tips on clinics in Bulgaria, Poland and Jordan.

In the United States, where many hospitals forbid experimental treatments outside of studies, a "back alley" network of doctors willing to perform the procedure has begun to develop, said Dr. Salvatore J. A. Sclafani, chairman of radiology at Downstate Medical Center in Brooklyn. He said he knew of about a dozen. The doctors try to stay under the radar, and patients quietly pass their names to one another.

"It reminds me of abortion in 1968," Dr. Sclafani said.

He said he had treated about 20 patients at Kings County Hospital before the hospital ordered him to stop in early April. He said he had a waiting list of 300 to 400 patients..

Meanwhile, researchers are trying to answer basic questions. On June 29, the team in Buffalo is to begin the first treatment study to include a control group. The controls will be given a sham procedure, and compared with others who get the real thing. Initially, 30 patients — only those with an early form of the disease — will be enrolled. Thousands of people applied.

The Multiple Sclerosis Societies in the United States and Canada will spend $2.4 million over the next two years on studies at seven centers. Researchers will study veins in patients with different stages of multiple sclerosis, in healthy people and in those with other neurological diseases. The studies will not test the balloon treatment, but are meant only to find out if the narrowings really exist, if they are related to the disease and if they are a cause or an effect.

Some patients complain that the society has been too slow to consider the new idea. A splinter group — the Reformed Multiple Sclerosis Society — has formed to increase the availability of the vein treatment.

Joyce Nelson, the president of the Multiple Sclerosis Society in the United States, said, “I wasn’t aware how thin the veneer was and how close to the surface the frustration was.”

“ ‘We can’t wait’ has resounded,” Ms. Nelson said. But she added, “There isn’t a way to rush the work that needs to be done.”

As the procedure has caught on in some places, few serious complications have been reported. But at Stanford University, a woman, 50, treated with stents (wire-mesh tubes used to hold blood vessels open) and blood-thinning drugs, died of a brain hemorrhage after returning home, and another patient needed heart surgery after a stent placed in a neck vein came loose and was swept into the heart. The procedures were stopped.

Dr. Michael Dake, who treated the patients, declined several requests for an interview, but said by e-mail that he hoped to discuss “a number of exciting developments” about the procedure “in the near future.”

Dr. Philip Pizzo, the dean of Stanford’s medical school, said the vein theory “deserves to be explored” — but only in studies. A study with a control group is being planned.

About 400,000 people in the United States have multiple sclerosis; worldwide, there are 2.1 million. (The disease is more common in temperate zones than in the tropics, and affects more women than men and more Caucasians than members of other groups.) It usually begins in young adults, with fatigue, vision problems, numbness, bladder trouble and difficulty with walking, balance and coordination. The disease eats away a fatty substance, myelin, that coats nerves, and gradually scars the nerves. The damage is thought to occur because the immune system, for unknown reasons, mistakenly attacks myelin.

Most patients, 85 percent, start out with a form called relapsing-remitting. In about half of those the disease becomes progressive, harder to treat and more disabling. Ms. Raval, who is 38 and has had multiple sclerosis for 13 years, implored Dr. Simon to test her for narrowed veins and, if he found any, to open them.

Dr. Simon regularly uses balloons and stents to open bile ducts and blood vessels. He was impressed with Ms. Raval’s determination, her trove of information and her background. She has a degree in toxicology and works for a drug company. But he was also familiar with Dr. Zamboni’s work—and deeply skeptical of it.

“My initial take was, it doesn’t make any sense,” Dr. Simon said.

But Ms. Raval had high hopes. She said she believed that the balloon treatment would be “the next best thing to a cure.” The usual drugs have not worked for her. Her 5-year-old son is eagerly awaiting the day when she can run with him, but she is finding it harder and harder even to walk. Theory Born of Experience

Dr. Zamboni, 53, (no relation to the inventor of the ice-rink machine) began studying the medical literature on multiple sclerosis in 1995 when his wife learned she had the disease.

“What I found was like a detective story,” he said.

He discovered reports of vein abnormalities and of brain lesions forming around veins. But the research had been abandoned. Vein disorders are his specialty; he has been studying them for 25 years. He began using ultrasound and other imaging techniques to examine veins, and found narrowings in the neck and chest veins in people with the disease, but not in healthy ones. He suspected that abnormal blood flow and pressure in the veins— not just narrowing alone — might cause minute amounts of bleeding in the brain, leading to an immune reaction and inflammation that damaged myelin and nerves. Iron deposits could also form, and add to the damage. He wondered if opening the narrowed areas might help.

In 2006 he began using balloons to treat patients, including his wife, whose symptoms went away and, he says, have not come back. Other patients who, like his wife, had relapsing-remitting disease, also recovered fully, he said; but some did not respond at all. In those with progressive disease, fatigue improved, but not mobility problems, according to a pilot study he published in December in The Journal of Vascular Surgery. And in half the treated patients, the neck veins closed up again. The study did not have a control group, and the patients were also taking drugs to treat multiple sclerosis . More rigorous trials will start in Italy this summer, Dr. Zamboni said.

Another doctor, Marian Simka, who has been performing the procedure in Pszczyna, Poland, has reported that it has made symptoms worse in some patients..

Researchers in Buffalo have confirmed (but not yet published) that narrowed veins and abnormal blood flow are more common in people with multiple sclerosis. But, while Dr. Zamboni found them in all patients and no healthy people, the Buffalo team found them in about 60 percent of patients and 15 percent of healthy controls.

Granting a Patient’s Wish

Dr. Simon sensed that Ms. Raval would have no peace unless she could learn whether she had narrowed veins, and he wanted to help her.

So he offered to perform a test to find out, a venogram. It involves passing a tube into a vein in the groin and up to the neck and chest, and then injecting dye to take X-rays of the veins. He felt sure there would be no blockages.

“And then she would be able to stop obsessing over this and move on with her life and get some kind of conventional treatment,” he said.

But he was stunned to find narrowings, right where Dr. Zamboni’s theory predicted: in the jugular vein in the neck, and the azygous, a vein in the right side of the chest.

Ms. Raval was elated. She felt certain that opening up those veins would solve her problems. Dr. Simon agreed to try.

Although it was, technically, an experimental procedure, Dr. Simon said he did not have to ask his hospital for permission to perform it. The details were similar to other procedures that interventional radiologists do every day. It is not uncommon for them to take a device approved for one purpose and use it for another, like putting a bile-duct stent into a blood vessel — a practice called “off-label” use, which the Food and Drug Administration allows. Interventional radiology, Dr. Simon said, is an “off-label specialty” that depends on innovation and adaptability.

On March 24, as Ms. Raval lay on a padded table in a treatment room, Dr. Simon passed balloons to the pinched spots in her right jugular and azygous, and dilated them.

The procedure took less than an hour. In the recovery room, Ms. Raval said she felt better already.

Over the next days and weeks, she noticed remarkable improvements. Her fatigue went away. She walked and climbed stairs more easily, and the color in her face brightened. Her husband and co-workers saw the changes, too, she said.

Was it real, or just one giant, communal placebo effect? Ms. Raval posted exuberant Facebook messages naming her “most amazing doctor.” Other patients began calling Dr. Simon.

Within a month, Ms. Raval again had trouble walking. She felt sure her veins had closed again. Another venogram showed they had. Dr. Simon reopened them.

Ms. Raval felt better — and then deteriorated again. On June 18, another venogram, her fourth invasive procedure in three months, suggested that the narrowings had recurred. She struggled over what to do. She could not keep having balloon procedures again and again. Dr. Simon consulted Dr. Dake, his former mentor, who recommended stents.Initially, Ms. Raval and Dr. Simon had thought stents too risky. Unlike balloons, which are inserted briefly and removed, stents are permanent. They can migrate to somewhere they do not belong, like the heart, as occurred in Dr. Dake’s patient. Or tissue growth can clog them.

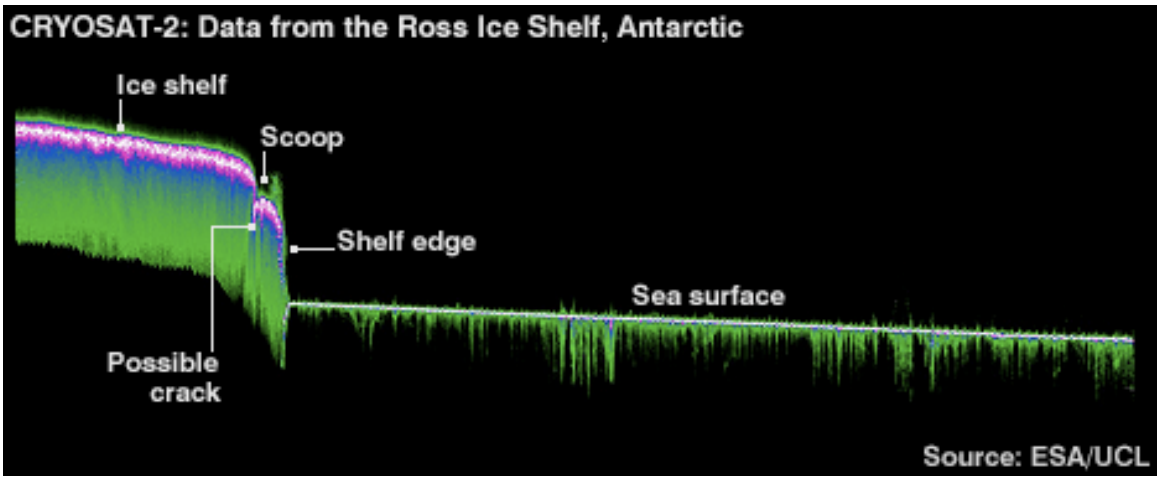
But Dr. Simon and Ms. Raval could see no other option. On June 23, he implanted a stent in her two jugular veins.“I really have a good feeling on this one,” Ms. Raval said a few hours after the procedure. “ I think this is the resolution, long-term. Let’s wait and see.”

In the meantime, Dr. Simon had conducted venograms on about 20 other patients with multiple sclerosis. He found narrowed veins in all but one. He said he was going to ask the hospital’s ethics panel for permission to perform balloon procedures in those patients. But the hospital would have to figure out how to get paid: insurance might cover venograms, but not an experimental treatment. The total charge for the procedure, including both hospital and doctor fees, would be about $10,000, Dr. Simon said.

He and his partner, Dr. Noam Eshkar, said they knew many researchers thought patients should not be given unproven treatments outside of clinical trials. They said they did not disagree. But they also sympathized with patients who had progressive diseases and who felt they did not have the time to wait. “In the real world,” Dr. Eshkar said, “things happen at the edge of scientific proof.”

http://www.nytimes.com/2010/06/29/health/29vein.html?ref=health

Cryosat-2 focuses on ice target



By Jonathan Amos
Science correspondent, BBC News Infographic (BBC) Cryosat tracks over the Ross Ice Shelf and Ross Sea on 11 April

The Cryosat-2 mission is delivering on its promise to make high-precision radar measurements of polar ice.

The first data from the European spacecraft has been presented at an Earth observation meeting in Norway.

The information clearly shows Cryosat has the required sensitivity to assess the state of Antarctic and Arctic ice, according to its lead scientist.

"All of the measurement concepts have been confirmed," UCL Professor Duncan Wingham told BBC News. Antarctic ice The Ross Ice Shelf is formed by landed glaciers that push out into the sea

The European Space Agency's Cryosat-2 satellite was launched in April on a quest to map the thickness and shape of the Earth's polar ice cover.

It carries a single instrument - a SAR/Interferometric Radar Altimeter (Siral) - which has a capability that far exceeds the previous space-borne radar technology used for this purpose.

Siral has an along-track (straight ahead) resolution of about 250m, which will allow it to see the gaps of open water between the protruding sea-ice floes of the Arctic.

With centimetre-scale accuracy, the altimeter will measure the difference in height between the two surfaces so scientists can work out the overall volume of the marine cover.
HOW TO MEASURE ICE THICKNESS FROM ORBIT
Infographic (BBC)

Cryosat's radar has the resolution to see the Arctic's floes and leads

Some 7/8ths of the ice tends to sit below the waterline - the draft

The aim is to measure the freeboard - the ice part above the waterline

Knowing this 1/8th figure allows Cryosat to work out sea ice thickness

A second antenna on Siral offset from the first by about a metre will enable the instrument to sense the shape of the ice below, returning more reliable information on slopes and ridges.

This interferometric observing mode will be used to assess the edges of Greenland and Antarctica where some rapid thinning has been detected in recent years.

At Esa's Living Planet Symposium here in Bergen, Professor Wingham released radar data taken from a Cryosat pass over the Ross Ice Shelf in Antarctica.

It records the edge of the 400m-thick mass of ice, and the sudden drop to the seawater surface which is probably covered with a thin veneer of ice.

"It shows us coming off the shelf; it shows the scoop [or slumping] you often get at the edge as a result of melting underneath, and then our pass over the sea - although there must be a lot of ice in the water. It's very still; there are no waves on it," explained Professor Wingham. "There's a feature in there that's so sharp, it's probably a fracture."

Another radar echo track, acquired this time in the Arctic, illustrates Cryosat's ability to see the gaps, or leads, in the ice - something it has to do to make an assessment of ice thickness. This only became possible last week after several weeks of calibration work on Siral. Infographic (BBC) Cryosat has to be able to distinguish the floes from the leads

"It's all starting to come into focus," said Professor Wingham. Esa's mission operations team has had to work the spacecraft to get it into the correct orbit to do its science.

The Dnepr rocket put the satellite initially into an elliptical orbit that took the platform to too high an altitude to make optimal ice measurements.This meant Cryosat had to fire its thrusters to tighten the ellipse, bringing the highest altitude down from 770km to under 760km; and the instrument was then re-tuned for the changed circumstances.

"We budgeted 15kg of fuel to acquire the initial orbit to allow for launch errors," said Dr Richard Francis, the Esa Cryosat project manager."What we actually used to achieve this [modified] orbit was 2.2kg. So, it was a lot less than we budgeted; we've got a lot of fuel left. We're now using about 2g a day in normal operations."

Esa expects to get at least five years of mission life out of the satellite.The spacecraft is mid-way through a six-month commissioning phase. Once this is complete, calibrated and validated data will be delivered to the scientific community.

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http://news.bbc.co.uk/2/hi/science_and_environment/10450425.stm

Simple test could detect Down's

By Emma Wilkinson
Health reporter, BBC News, in Rome Amniocentesis Amniocentesis carries a small risk of miscarriage

A blood test during pregnancy could one day replace more invasive tests for Down's syndrome, say researchers.

High-risk women are currently offered an amniocentesis test, which carries a risk of miscarriage.

But Dutch researchers told a fertility conference they are on the verge of developing an accurate way of testing the mother's blood for chromosome disorders in the foetus.

Experts said it was promising but early days.

The test is based on a series of "probes" that attach to specific points on a chromosome.

It is the same technique that is already used to detect problems in foetal DNA in samples taken from the amniotic fluid in the womb.

But the advantage of testing the mother's blood is that it is non-invasive, quick and carries no risks for the foetus.
Early days

Delegates at the European Society of Human Reproduction and Embryology heard that the team have so far successfully identified the male or Y chromosome from the foetus in the mother's blood, proving their technique works.

It can be used as early as six-to-eight weeks, they said.

Continue reading the main story

It is the holy grail of prenatal diagnosis to try and find a reliable method of diagnosing Down's syndrome and other chromosome abnormalities without doing invasive testing

Professor Stephen Robson RCOG

They are now using the same principle to develop probes to detect the extra chromosome found in Down's syndrome.

It will be tested in women at high risk of an abnormal pregnancy and so already undergoing prenatal screening and invasive tests.

But if proven to be accurate, the researchers hope that all women will have access to the blood test within a few years.

Study leader Dr Suzanna Frints, a clinical geneticist at Maastricht University Hospital, says the costs of such tests are coming down all the time and it could eventually be available for as little as £25.

"Blood samples can be taken during routine antenatal visits."

"It is inexpensive compared to the costs of invasive prenatal diagnosis, and could easily be implemented at low cost.

She added: "At the moment, the reliability of the test is about 80% due to false negative results, but we are working to improve the accuracy."

Professor Stephen Robson, spokesman for the Royal College of Obstetricians and Gynaecologists, said there are a number of labs around the world working on different techniques for such diagnostic tests.

"It is the holy grail of prenatal diagnosis to try and find a reliable method of diagnosing Down's syndrome and other chromosome abnormalities without doing invasive testing.

"This is another technique that could offer the potential to diagnose Down's syndrome non-invasively but it's important to emphasise that it is some years away."

http://news.bbc.co.uk/2/hi/health/10453774.stm

•Snakeheads: the Asian Fish That Terrified Arkansas

How a government team called Operation Mongoose tried to get rid of the invasive northern snakehead by poisoning 400 miles of Arkansas waterways.

By Sam Eifling

Lee Holt, a biologist with the Arkansas Game & Fish Commission, aims his Chevy Silverado south, heading from his field office in Brinkley, Ark., out to the rice and soybean farms that surround this small Delta town. It's a hot, sticky summer day, and the A/C is thrumming inside the cab as Holt passes a Lutheran church on Highway 49 with a marquee that reads, "We Don't Serve A Wimpy God." This is the same road that he traversed a few months earlier, when he got a call from Russell Bonner's farm that changed his life and launched a sort of paranoia — and eventually an unprecedented government response — in these parts.

He let himself hope then that it was a snipe hunt; he's been on plenty of them as the concern spread. The concern comes in the form of telephone calls from amped-up Arkansans who are convinced that they've found specimens of the northern snakehead, Channa argus. The fish does not belong here. It has no local predators. It is an obligate air-breather and thus can live outside water for days. It can wriggle swiftly through the scantest smattering of water. It is a top-level predator with fearsome teeth and a carnivore's appetite. It breeds up to five times a year, producing tens of thousands of young, and as both parents protect the hatchlings, it is a prolific breeder.

Fishermen catch something that looks even vaguely like this invader, and they freak.

Callers have told Holt they caught a fish — a snakehead for sure — and threw it into the weeds, but they can tell him where it is. A woman called recently and said she was sure a fish she found was a snakehead because it "attacked" a bucket she set near it. "People just want to have a snakehead," Holt says. "They're confident, regardless of what you tell them."

The irony is, no one in his right mind wants the fish around. Even the prospect of their existence here is a relatively new phenomenon. It was April 2008 when Bonner phoned, claiming he had a snakehead. At the time, the fish was thought to be contained in the United States; none had been confirmed in Arkansas, a fish-friendly state that's home to nearly every species of freshwater game fish found in the United States. "I tried to talk him into that he had a bowfin," Holt recalls.

The rice farmer knew otherwise. He had found the fish on a dirt access road that crosses his land. A culvert had clogged in heavy rains, and it wasn't unusual to see curios float up. Bonner thought the fish a bowfin (also known as a grinnel), but it looked odd. He scooped up the live fish with a shovel and tossed it in the back of a utility truck, drove it back to his office and asked whether anyone had seen a grinnel like it before. A couple of days later, someone remembered the fish and went to dispose of it.

"Fish was still alive," Bonner recalls as he and Holt stand on the stretch of dirt road where the fish was found. "After a day and a half of laying in the back of a truck, he whacks it with a shovel and throws it off in a ditch. I get to thinking about it and talking to different people, and said, 'That might have been something we need to look at.'"

His concern was grounded; though at the time, no one in east Arkansas knew it. Since its first appearance in two Maryland ponds in 2002, northern snakeheads had popped up variously in California, New York, Virginia, Florida and North Carolina, always to outsized reaction. The U.S. Fish and Wildlife Service made importation of the fish illegal under the Lacey Act in 2002. But in 2000, a fish farm south of Brinkley tried raising snakeheads, which fetch high prices in Asian fish markets. When informed that the fish could

potentially constitute a menace, the owners seined the pond and cast the fish onto the bank. Nothing seemed amiss over the intervening years, though Bonner now says of the creeks around his place “used to be good fishing; then we noticed you couldn’t catch any fish. ‘Course, we didn’t know why.”

The theories as to how the fish got from the fish farm to the Bonner place, a solid mile away, is anyone’s guess. If you believe in the fish’s alleged powers of cross-land propulsion, one or two must have flopped their way to a nearby ditch. Maybe a pregnant female missed the seining, laid in the muck and escaped through drainage.

Either way, years passed. All was quiet. And then Holt got a gander at the fish that survived a solid day in the back of a truck.

“As soon as Russell opened the top of the bucket,” Holt says, “my heart sunk down to my stomach.”

Instead of being ground zero for an outbreak of invasive fish, Brinkley would prefer to be known as the home of the ivory-billed woodpecker. The majestic bird was believed to be extinct in the United States for about 50 years, until sporadic sightings and a blurry video shot in 2004 suggested to experts that a few specimens may have remained shrouded in the swamps all these decades. Ornithologists descended on the small town and traipsed into the woods looking for proof. Hopeful national media followed the redemptive storyline: Maybe we didn’t slaughter all these birds after all. The town transformed into a tourist trap for the woodpecker set. Years later, with no further evidence of the bird’s existence, the billboards that flank Brinkley on both sides of the Interstate advertising the town as the bird’s home seem ever sadder, ever more desperate.

The story of the bird runs perpendicular to that of the nefarious fish now infesting the backwaters around this Delta town. The woodpecker died because people prized its beautiful head, and because they drained swamps and felled forests to clear the ground for rice and soybeans. In so doing, they made the land just that much more hospitable to the snakehead, whose native Asian habitat is, like Arkansas, a land suited to growing rice with its concomitant irrigation systems and watery flats. (You have to wonder whether anyone has attempted a Chinese translation of a bumper sticker common here: “Have a Rice Day.”)

Still, it was hardly ordained that the fish would find its way to these parts, let alone find purchase here. The story of the snakehead’s spread in the U.S. and to Arkansas illustrates the seeming inevitability of unnatural migrations in a world once again flat. The northern snakehead is native to Russia, China and Korea and came to North America as an aquarium-bound pet (though one that potentially will devour its tankmates) and as a prized main course, often steamed with vegetables, pan-fried or used to anchor a whole-fish soup. (The fish’s physical durability makes it a relatively easy animal to transport live.) Here, it has the potential to join a roster of past invasives that have so thrived that they could be mistaken for natives: rats, hogs, kudzu, Japanese honeysuckle, goldfish, Rosa multiflora, burning bush, pythons, Brazilian pepper plants, the emerald ash borer, zebra mussels, iguanas and white mulberry. The Asian carp, which now is threatening Lake Michigan, also had a breakout from Arkansas aquaculture. Invasives compete with native species for food, spread disease and often lead to reduced biodiversity.

Species enter and fade from foreign ecosystems all the time; considering the arduous task that is evolution, it’s no surprise that most nonnatives entering a given environment will not prosper. But the ones that do survive and thrive share certain traits. Foremost among those, according to Chris Bright, author of Life Out of Bounds: Bioinvasion in a Borderless World and president of the nonprofit Earth Sangha, which seeks to restore native forests, is a tendency not to rely too heavily on any other single species. “They tend to be generalists, whether they’re a plant or an animal,” he says. That is, they don’t require a symbiosis to feed or breed. They adjust to variations in climate. They multiply with ease. A plant specialist, Bright groups these qualities under the term “weediness.”

The northern snakehead has displayed all the tenacity of a weed in its American infestations. As a survivor,

it's concerning; as an omnivore, it's potentially a threat to nearly every fish in an aquatic ecosystem; as a prolific breeder, it's the total package. In his 2004 U.S. Fish and Wildlife study of snakeheads, fishery biologist Walter Courtenay cites snakeheads' threat to native fish (and thus, to the economy in many places), and especially the threat to endangered fish and crustaceans, as among the fish's greatest potential impacts. "Depending on the habitat," he wrote, "snakeheads have the potential to detrimentally alter aquatic communities." He concluded that the fish's probability of establishment and the consequences of that establishment were "high." The fish's hideous countenance and creepy air-breathing, while not themselves dangerous, only make it that much easier to revile.

Maryland game officials addressed the infestations there by poisoning ponds with rotenone, a piscicide derived from the stem of a Mexican vegetable and considered relatively harmless to people. In those closed waters, the fish was eradicated. Two years later, though, it appeared in the Potomac River, a vastly more complex system.

Virginia biologists John Odenkirk and Steve Owens have monitored the fish in the Potomac for years. Dogue Creek, a Potomac tributary they define as the epicenter of the outbreak, has been home to 80 percent of the 505 snakeheads captured (mostly by stunning them with an electric charge). In a 2007 journal article in Transactions of the American Fisheries Society, they wrote that the maximum size of the snakeheads surveyed increased each year, suggesting a maturing population. Among the identified remains of other fish in the snakeheads' guts, the fifth most common was the goldfish — like the snakehead, a "naturally reproducing exotic species," the authors noted.

Media coverage of the fish peaked in 2004 and 2005, Odenkirk and Owens wrote. Anglers held snakehead "rodeos," and stores offered bounties for the beasts. A 2005 Virginia law made it legal to keep creeled northern snakeheads so long as fishermen had caught the fish legally, killed it and notified authorities. Catch rates, both by anglers and by scientists, continued to rise.

"Once we recognized that we had natural reproduction, it was not even a consideration that we could eradicate them," Odenkirk says in an interview. "Biology and physics are not going to allow for the eradication of that fish from a place where you have mile-wide channels in places."

Apparently, snakeheads have the potential to get cozy nearly anywhere in North America. When a team of scientists modeled the potential distribution of the northern snakehead for the *Canadian Journal of Fisheries and Aquatic Sciences*, they found that it could range from deep in Mexico to all but a few hot crannies of the continental United States, across Canada and up into the Aleutian Islands. (The northern snakehead prefers air temperatures between 41 and 64 degrees and tolerates almost 200 days of frost a year.)

Past initiatives to battle the snakehead were successful only in containing the creature to a relatively static body of water such as a lake. For all their adaptability, snakeheads tend to prefer stagnant to flowing water. "The nastiest water you can think that a fish would be in, that's where they'll be," is how Holt puts it. But in Arkansas, if the fish does migrate, either by will or flood or human carrier, the direst concerns border on an invasive-species disaster. Save for a small bottleneck, there's no natural barrier from the infested watershed of Piney Creek to Big Creek. Big Creek runs into the White River, a trout fishing mecca known for its pristine waters. From that point, the White runs south through the White River National Wildlife Refuge and, about a hundred miles north of the Louisiana border, connects to the Mississippi River.

From there, it could go almost anywhere in the eastern U.S.

No one really knows whether the snakehead could spread through these routes, whether it would be inclined to and whether it would thrive in doing so. But biologists aren't keen to simply watch and see where the snakeheads go.

"What happens if we don't do anything?" Holt asks. "What happens 10 years from now, 15 years from now, 30 years from now? Have they impacted our sport fish population? Is it pretty much just all snakeheads over

in the Delta? We don't know."

The authorities in Arkansas decided there was no point in taking chances. In the spring of 2009, they brought to bear the full force of helicopters, amphibious tanks called Marsh Masters and even spring-breaking undergrads with the goal of eradicating the snakeheads. The name was Operation Mongoose, and the method was to indiscriminately poison every gilled animal anywhere in the vicinity of a known snakehead.

The first thing that strikes you about Ginny Adams' classroom is the smell of formalin, a pungent embalming agent, the acrid scent of decay staved off. A couple of months after Operation Mongoose, the science classroom at the University of Central Arkansas — in Conway, about 90 miles west of Brinkley — is a cheery repository of dead snakeheads. Country radio plays on a stereo while students wander in and out, some handling the fish corpses wrapped in cheesecloth and stowed seemingly in every sink and cranny.

Arkansas launched Operation Mongoose in an effort to eliminate snakeheads. (Courtesy of University of Central Arkansas)

A weeklong eradication effort turned up thousands of dead snakeheads, 786 of which were toted back here for study. The most fearsome of the lot is an adult nearly 30 inches in length, a gruesome silver creature nearly as long as the ice chest that held him in a back room. But by far the more concerning fish are the silvery young, bottled up in a cafeteria-size repurposed mayonnaise jar. These are the juveniles, the 1- and 2-year-old fish that Adams tallied in astonishing numbers and that may in hindsight constitute the best justification for the expensive attempt to wipe out the snakeheads.

"The crazy thing is, even in ones not much bigger than this, we're getting eggs and sperm," Adams says. "In their native range, we're looking at second- or third-year spawning. Here, we have the potential in Arkansas to look at year-ones actually able to produce gonads."

That is, not only were these fish part of an apparent baby boom, they were sexually viable earlier than Adams had found in East Asia. Even for a fish with such a broad possible range of survival, something was clicking for it in Arkansas that Adams says is unparalleled in the literature on the fish.

Hence, Operation Mongoose.

The seeds of the operation were planted two weeks after the first snakehead turned up at the Bonner farm. On April 28, 2008, a follow-up sweep produced 90 snakeheads in a single 2.5-mile irrigation ditch, and the next day, snakeheads were found in Piney Creek. Not long afterward, the operation launched, and it was a multi-agency affair: helicopters and ATVs from Arkansas, wildlife officials from Mississippi and Tennessee, and about 20 UCA students at any given time on the ground scouting, poisoning and collecting fish.

It was a grueling week. When students spotted fish, they'd quarantine those waters with block nets, then set about cataloguing the environment: the water chemistry and depth, the stream width, the vegetation types and density. A team would hit the water with rotenone, the fish poison. Another team would return to find bodies of dead fish of all sorts, and collect the snakeheads (along with some similar species, like bowfin) for transport back to the parking lot of a motel, where students injected the fish with formalin, wrapped them in cheesecloth and packed them in coolers. Then they'd adjourn to an Italian restaurant that couldn't sell them alcohol but saw no problem with the exhausted workers bringing their own in the back door.

"Any time you get a nonnative species such as snakeheads that have the potential of gravely harming your native species, it's going to draw a lot of attention," said Ricky Campbell, the hatchery manager for the Pvt. John Allen National Fish Hatchery, a U.S. Fish and Wildlife Service facility in Tupelo, Miss. During Operation Mongoose, Campbell coordinated a Fish and Wildlife assessment team that followed a day behind the eradication teams to count the dead fish. On his first day, his assigned coordinates took him to a flooded rice field. His drop point was 1.2 miles from his pickup, he said. The only way to do his job was to walk it, through the water. "I didn't go 10 yards before I saw a cottonmouth as big around as my arm," Campbell said. That snake was the first of 17 he saw on that walk. But by the end, he was convinced of the eradication's efficacy: "It was a good kill. Critters were dead all down through there."

The agency dosed larger areas by helicopter. In all, 18,000 pounds of powdered rotenone and nearly 3,000 gallons of liquid rotenone were strewn along 400 miles of waterways across 68 square miles — an area three times the size of Manhattan. Campbell said the only operation he's been a part of with the same militaristic feel and command structure was Hurricane Katrina relief. The total price tag was around $750,000.

Considering the indiscriminate murder of the native fish, including game species, the local response was encouraging. "We're mud-covered, down in a ditch, seining," Adams says, "and these people would pull over and ask, 'Are y'all trying to get those snakeheads? Good! Get those the hell out of here!'" People who worried that the snakeheads would devour the native bass population missed the larger point, she says. Game fish can be restocked, but if the snakehead was found to wipe out smaller fish, those would be gone for good.

"A lot of people from all over the country are watching Arkansas very closely right now, because from a policy standpoint, from an action standpoint, have we done the right thing?" the professor says. "And maybe we didn't, but we had to try."

As it turned out, further study has been inconclusive on that point. For one thing, rotenone poisoning causes the fish to disgorge, making it difficult to ascertain their diets from stomach contents and therefore difficult to assess just how much of a threat they posed to other fish. And curiously, the fish found were, on average, not as heavy for their length as those pulled from the Potomac in studies there.

Adams was encouraged by the returns. Best case? The operation snuffed the snakehead problem completely. She admitted this was highly unlikely. More likely, the operation depressed snakehead numbers such that they could be contained through standard control methods like spot treatments with poison and local monitoring. "The other option is," she said, "by killing out all the natives, we opened up a huge ecological niche for the

snakeheads. And [then] we see a population explosion. That's the worst-case scenario."

It's nighttime in the swamps of Louisiana. A fish the size of a sedan has just leapt onto a houseboat to attack a man who kills it with a shotgun blast to the beast's head. He cuts out the fish's heart, barbecues it and takes a defiant bite. That's when a second giant fish leaps out, eats his torso and then wriggles back into the dark water.

"It can breathe out of the water?" an onlooker yells. "How the f— can it do that?

A foxy biologist pipes up. "It must have a vestigial air lung, like Chinese snakeheads," she says. "They can live out of the water for days. They're voracious. They took over a lake in Maryland a couple of years ago, and the Wildlife and Fisheries people had to poison the whole lake. They were scared. …"

"It's a monster!" another woman cries. "It's not a fish!"

This impromptu (and astonishingly accurate) biology lesson is from Frankenfish, one of at least two snakehead-inspired B-movies that came out in 2004 (along with Snakehead Terror, another instant classic) that played upon — or perhaps preyed upon — the hysteria that marked early revelations of the fish's arrival in U.S. aquacultures. Both Odenkirk and Courtenay mentioned during interviews for this story that their views of the media had been dimmed by their experience with previous snakehead coverage; Courtenay agreed to be interviewed only via e-mail because he'd been misquoted in the past. (One myth he'd like to dispel: The fish cannot "walk" across land.) None other than National Geographic referred to the animal as "Fishzilla."

Eventually the journalism subsides, and science is left to do the durable fact-finding. After studying the fish in the Potomac for years, Odenkirk is less than sold on the threat the snakehead poses to that ecosystem. "We've cried 'the sky is falling' a few times on things like hydrilla, and hydrilla was one of the best things to happen to that river," Odenkirk said. "Some invasives haven't proven to be an ecological disaster."

The northern snakehead is, after all, a fish, not a monster, and its impact has yet to be determined. Say this for the fish: It is a marvelous survivor. It was just weeks after Operation Mongoose last year that a fisherman caught a snakehead 8 miles east of the Piney Creek drainage; the man chopped its head off and reported it to Game & Fish. "I think it was just a fluke fish," Holt said. "You have that all the time. You have manatees up in Memphis. You have bull sharks in St. Louis. Stuff like that happens."

In October, UCA students conducted another week of sampling in the areas where the fish were formerly rampant. This time, they found just eight fish in the ditches and backwaters where thousands died in the eradication. The Bonner farm, the site of the original discovery and by far the most fecund ground for the fish since, produced five snakeheads. High water due to record rains at the end of October and a generally wet winter — the third straight year that the state has seen abnormally heavy rains — have delayed further sampling. Viewed optimistically, the high water could push the fish far enough away from each other (especially when waters recede, isolating some backwaters) that spawning will be less likely.

"Going into eradication, we knew we weren't going to be 100 percent effective," Holt says 10 months after Operation Mongoose, "but we did accomplish what we were after. It bought us a little time."

That time will go to further study. The question of the snakehead's interaction with the local species, especially the biologically similar bowfin, is, in one sense, the primary question here. After all, why fear the introduction of a new, delicious, self-sustaining species if it doesn't interfere with the native flora and fauna?

Courtenay points out that the effects of nonnatives on aquatic systems with only a few species of fish (desert river environments, for example) can be fast and devastating. But in a more interwoven environment, it could take years or decades for an invasive's impact to be felt. There is, he says, "no guarantee that such an addition

will, in the future, not become a dominant species in that ecosystem to the detriment of the natives." In his view, Operation Mongoose was an expensive test of whether eradication was possible. Judged on that basis alone, the effort was unsuccessful. "This was a well-intended effort that has now indicated that trying to eradicate an invasive aquatic species is the ultimate impossible dream," the biologist says. Maybe even up there with trying to wish an extinct native bird back into existence.

Further study of the fish may yield a solution more elegant than mass fish kills. Until that happens, the state is invested in local monitoring and control. Every so often, an angler pulls one out of a ditch and reports it. Mongoose did not finish off the snakeheads. "Looking back on it, it was a very, very near insurmountable task," Virginia's Odenkirk said. "The deck was stacked against them to begin with, just based on the physiology of the fish."

But an infestation, even by an accused monster, doesn't necessarily constitute calamity. By summer's end, Adams felt good enough about the results that she was able to strike an upbeat tone when she presented her findings to the Oklahoma Chapter of the American Fisheries Society. Among the surprises she relayed: The fish were found largely in areas with far less vegetation than has been characteristic of northern snakeheads elsewhere, and they were found in density similar to the bowfin, the most similar native fish.

Measurements of the fish begat a bar graph of the population distribution — weighted heavily toward young fish — that reads like fear unrealized. "This size-class structure that we observed is very similar to what they had in the Potomac River the year they had a 950 percent increase in population density," she told the conference. "Operation Mongoose occurred when we were probably right on the cusp of that sort of increase." In this stage, at least, the worst may have been averted.

One of the slides in Adams' presentation depicted a smiling, bearded student holding a knife near a filet of fish on a cutting board in the bed of a trailer. Superimposed on the photo were words Arkansans may come to live by when it comes to future snakehead control. It read, "If you can't beat 'em, eat 'em."

http://www.miller-mccune.com/environment/snakeheads-the-asian-fish-that-terrified-arkansas-16876/

•Bamboo Houses to the Rescue

Bamboo houses combat climate change, encourage economic growth and protect the poor from natural disaster. Why aren't there more of them?

By Elisabeth Best

Over time, poor countries don't experience more natural disasters than rich countries, but poor people — even those living in rich countries — suffer more in a catastrophe. Since the dawn of civilization, infrastructure has played a crucial role in deciding who and what survives a flood, earthquake, tropical cyclone or other natural disaster. And the wealthy really are different from you and me; they have more infrastructure.

Beyond increasing per capita income — the goal of many, if not all, development projects — what can be done to provide better infrastructure and reduce the death toll of natural disasters in developing nations? According to a set of specialized architects and builders, one answer involves permanent bamboo housing. They argue that bamboo cultivation and construction can protect people in disaster-prone areas. History suggests they may be correct.

A 7.5 earthquake in Limón, Costa Rica, in April 1991 destroyed homes built with concrete and rebar, but all 20 of the more-flexible bamboo houses at the earthquake's epicenter remained standing. When three typhoons swept into the Cook Islands in 2005, one producing winds of 173 mph, they devoured everything in their path — everything, that is, except a group of bamboo houses on the beach.

But in the age of global warming, bamboo has a benefit beyond construction: Both young and mature bamboo plantations capture more carbon than similar stands of trees. In a 2007 paper titled "Sub-optimal Equilibriums in the Carbon Forestry Game: Why Bamboo Should Win and Why It Will Not," energy specialist Raya Kühne said, "A non-tree species — bamboo — may be one of the species most well-suited to the Clean Development Mechanism's goals of maximizing carbon revenues and promoting sustainable development."

In the Japanese culture, bamboo symbolizes "the perfect man." It is strong but flexible and was the first green plant to reappear after the bombing of Hiroshima. Bamboo has twice the compression strength of concrete and half the tensile strength of steel.

The Chinese have used it for more than 5,000 years for housing, food, furniture, medicine and "fire arrows." In Ecuador, the pre-Columbian record includes pottery from 3,500 B.C. that depicts bamboo dwellings, and colonial-era buildings in Colombia have bamboo in their walls. Thomas Edison carbonized bamboo for use in the first successful light filaments, and an entirely bamboo airplane was constructed in the Philippines in the 1940s.

Bamboo is the largest grass in the world, and there are more than 1,000 species of the plant. Its uses range from paper products to eco-friendly textiles; its shoots are a culinary staple in much of Asia. Today, bamboo is most frequently used in the U.S. for landscaping and fishing poles, but it has also caught on as a low-cost alternative to hardwood flooring. A number of companies offer bamboo bicycles, and a small town in the Philippines has even developed three bamboo car models that run on coconut biofuel.

There are two types of bamboo: running and clumping, names that describe their rhizomes, or roots. Running bamboo has a bad reputation among gardeners; it has a long horizontal root network that spreads quickly and reaches far. Clumping bamboo, the less common of the two, has a rhizome network that runs more deeply underground and does not spread horizontally.Bamboo has been used as a building material in the developing world for centuries. It (literally) grows like a weed — under the right conditions, some species grow up 1.5 to 2 inches per hour. Like poverty, bamboo is especially prolific in the tropics; perhaps what makes the concept of bamboo as a material for low-income housing most appealing is this symmetry. The International Network for Bamboo and Rattan, a Beijing-based intergovernmental organization that seeks to improve the benefits of the two plants, estimates that more than 1.5 billion people are in some way dependent on bamboo and rattan.

Not all types of bamboo are ideal for construction, and without treatment to protect against insects and mold, bamboo houses will last only 15 years or so. But as a construction material, bamboo's advantages over wood are numerous: It is cheaper to plant, grows faster and can be harvested using less fossil fuel. While trees are typically harvested every 20 to 50 years, bamboo reaches maturity in four to six years and can be cut two or three years after that. Bamboo plants' rhizome maps grow continuously throughout their life spans — which can be from 10 to more than 100 years — meaning that unlike tree roots, which die and decompose after a tree is harvested, releasing their stored carbon, rhizomes stay alive even after bamboo is harvested.

Costa Rica's Bamboo National Housing Project began in 1986 and demonstrated the ability of bamboo to provide durable, seismically sound housing while contributing to reforestation. Funded by the United Nations Development Programme and the Dutch government, the project sought to diminish Costa Rica's housing problems by planting, harvesting and building with Guadua, a locally available strain of bamboo. It helped create more than 2,000 houses in rural areas, including the indigenous communities of Terraba, Rey Curre and Boruca, before the turn of the century. (The project stopped producing houses shortly after its adoption by the Costa Rican government in the mid-1990s.)

More recently, bamboo housing has gained attention for its use in disaster relief efforts. After an earthquake destroyed 80 percent of the buildings in Sichuan, China, killing more than 70,000 people, the International Network for Bamboo and Rattan built more than 100 temporary prefabricated bamboo houses in a resettlement area. Almost two years later, in March 2010, the European Union and INBAR kicked off a project to establish a sustainable bamboo processing chain in the earthquake-torn region, which is rich in bamboo resources.

Following the devastating earthquake in Port-au-Prince in January, the World Bamboo Organization, a tax-exempt trade association formed to facilitate the flow of information about bamboo, launched a pilot project in Haiti to ignite a long-term plantation and housing development. The organization, led by Jeffree Trudeau, a co-owner of Bamboo Living, is working with CO2 Bambu, a Nicaragua-based for-profit enterprise that encourages Guadua cultivation and sells pre-fabricated bamboo "casitas." So far, the World Bamboo Organization has raised money to fund the construction of 33 pre-fabricated temporary homes in Haiti. These can be made into permanent housing through the application of stucco.

"The first step is to bring in a pilot project, which will increase the visibility of bamboo as a construction material," Trudeau explains. "The next stage is to be planting bamboo and growing bamboo plantations, so that the Haitian people have something to base an economy on. There are certain species that will grow very well and have proved in other countries to support developing economies very well."

Previous efforts to reforest Haiti have shown that bamboo thrives there; under the U.S. Agency for International Development's Farmer to Farmer program, Norm Bezona brought 200 bamboo plants to the nation from Hawaii in 1999 and educated residents on the multiple uses and benefits of bamboo. After four months, 40,000 plants had been generated from the original 200. Today, approximately half of these plants are being used for construction.

Building with bamboo makes sense in the warm, wet climates where it tends to grow best; in some places, however, it's simply cheaper to use wood. For that reason, it's not likely that bamboo houses or plantations will overrun the United States any time soon. (The U.S. abandoned its 1890 investigation of bamboo's potential as an agroforestry crop after only nine years.) But numerous projects incorporating bamboo cultivation and construction are under way in rural, tropical locales.

Working with the World Bamboo Organization, Trudeau has led workshops in Vietnam, Nepal, India, Indonesia and China to teach residents how to build with bamboo. He has also built low-cost housing prototypes for Bhutan, Colombia and Nicaragua. CO2 Bambu has partnered with small producers in Nicaragua and plans to plant up to 2,500 acres of Guadua bamboo there by 2016. The Hanoi, Vietnam-based Prosperity Initiative works to shift the bamboo industry there to higher-value industrial bamboo products like flooring, panels and paper, with the goal of bringing 750,000 people out of poverty by 2020. Research conducted in China shows that bamboo helped move many poor households up the socioeconomic ladder in Linan County, a part of Zhejiang Province.

One of the biggest obstacles bamboo must overcome to gain international acceptance as a building material is its reputation as "the poor man's timber." This reputation has been fueled by a number of factors: low-quality bamboo exports to the United States, a poor understanding of ideal building varieties and centuries-old beliefs about its suitability for construction. In the Indian caste system, for example, the highest classes build with stone, the middle castes use wood and only the poorest use bamboo.

Also, there are few construction and production standards to guarantee the quality of bamboo products and buildings. Trudeau and his co-owner in Bamboo Living, David Sands, have worked for more than 10 years to incorporate bamboo into the International Code Council's building standards, so their bamboo houses could be sold in the United States. Trudeau is working with the World Bamboo Organization and the International Organization for Standardization to develop regulations for bamboo products around the world.Matthew Kahn, a professor in the UCLA Institute of the Environment, Department of Economics and Department of Public Policy, believes that once standards have been developed, The World Bank and the U.S. Agency for International Development will help enforce them through their financing regulations.

Kahn thinks that nongovernmental organizations are an ideal vehicle for promoting bamboo homes in rural areas, but venture capitalists should build bamboo housing for a major, often-neglected demographic: the urban poor. "There are hundreds of millions of people moving to cities in Asia and Latin America, and they need new homes," he says. "Businesspeople could get very rich by building bamboo housing developments, but there is the question of whether the new urbanites have the money to pay for the homes. Developers could build bamboo houses to rent out to day laborers."

There are reasons bamboo is not a larger segment of Third World forestry and construction sectors. Kühne, an energy specialist with the GTZ Programme for Sustainable Economic Development in Ghana, has found that forestry planners do not often use the plant because its acceptance in the construction market is far from certain, and its carbon-absorbing capabilities do not, as yet, generate additional profits. Also, she says, there is a lack of bamboo research. Although numerous academic papers have documented the carbon sequestration attributes of different tree species, relatively little attention has been paid to bamboo.

Still, Sands and Trudeau are optimistic that bamboo plantations will be part of carbon-credit or payment-for-ecosystems services schemes, as governments around the world come to grips with climate change. "We have an opportunity here in the bamboo industry that's not in most industries," Trudeau says. "The resource, the raw material, has the incredible advantage of affecting climate change, so it makes so much sense to start using it sooner rather than later."

http://www.miller-mccune.com/environment/bamboo-houses-to-the-rescue-16347

•Measuring the Melting Arctic Sea Ice

A new satellite will measure to the centimeter just how far gone, or going, the Arctic ice cap really is.

By Bruce Dorminey

While the world's eyes focus on the catastrophe in the Gulf, climatologists are tracking a decades-old cataclysm at the top of the world — dwindling Arctic sea ice.

This year is projected to surpass 2007's summer sea ice minimum, when sailboats were seen navigating their way through large cracks in polar ice floes.

"Where Arctic ice used to be 3- to 5-meters thick in most places, now it's tough to find ice that's over 3-meters thick," explained Ignatius Rigor, a climatologist at the University of Washington in Seattle. "Most of the Arctic is covered by 2-year-old ice. It used to be covered by ice that was 30 years old."

A decade of warmer than normal Arctic air temperatures, along with warmer ocean waters moving their way north, are thought to be responsible.

Although records indicate that Arctic sea ice cover has been disappearing since the late 19th century, U.S. submarine data show a more recent appreciable dip in its thickness dating from the early 1980s.

Projections call for the Arctic Ocean to become open water, at least in summer, as early as 2040. The last three decades of loss — in both the volume and extent of summer sea ice and in more permanent multi-year Arctic sea ice packs — are climatologically unprecedented during the last few thousand years. And such loss can't be explained by any known natural variability.

Even so, CryoSat-2, a $170 million ice-measuring polar satellite launched by the European Space Agency in April, will devote a large part of its mission to helping climate researchers understand the how and why of Arctic climate change. Specifically, CryoSat will measure the rate at which the thickness of Arctic sea ice changes over time.

•ESA's Ice Mission

the European Space Agency's CryoSat mission is dedicated to precise monitoring of the changes in the thickness of marine ice floating in the polar oceans and variations in the thickness of the vast ice sheets that overlay Greenland and Antarctica. For more details on the mission, click here.

Currently in its commissioning and verification phase, ESA expects CryoSat's scientific mission to begin in earnest this fall. (An earlier ice-measuring satellite, the original CryoSat, crashed near the North Pole shortly after takeoff in 2005.)

"CryoSat was designed to measure rates of change in elevation and thickness at monthly intervals over a greater area of the polar region's ice cover than any of its predecessors," said ESA geophysicist Mark Drinkwater. "This will give us robust evidence for seasonal and interannual variations in ice thickness."

Traditionally, cloud cover could hamper orbiting satellites such as Europe's Envisat and the United States' ICESat. However, CryoSat is using a state-of-the-art radar altimeter that can pierce the polar cloud cover to better distinguish between electronic echoes from water and electronic echoes from ice.

By recording the distance between Earth and the satellite, Cryosat will be able to precisely measure changes in these ice floes' height above the sea surface, with accuracies down to a centimeter.

Rigor notes that CryoSat's lifespan of three-plus years is not long in terms of climate; to understand climate variability requires decades of data at the least.

Nonetheless, climatologists know that during winter, Arctic sea ice typically covers up to 15 million square kilometers, and that between Arctic summer and winter, an area roughly the size of Europe melts and then refreezes.

A permanent loss in such ice cover can create a warming loop: Earth reflects less solar radiation back into space, the underlying ocean absorbs more sunlight. This lessening in reflectivity, or albedo, in turn heats up both the Arctic's ocean and surrounding atmosphere, causing a vicious cycle of melting ice and higher temperatures. That in turn impacts temperatures, temperature swings and sea level around the planet, as well as possibly causing irreversible changes in the Arctic itself.

"The short-term future of sea ice is mostly speculation; in the longer term it will continue to decline," said Ron Kwok, a polar scientist at NASA's Jet Propulsion Laboratory in Pasadena, who is also on CryoSat's calibration and validation mission team. "There's more [sea ice] variability now than we've seen in the past 30 years. There's some instability in the Earth climate system that we simply don't understand."

Rigor says that the Arctic's current sea ice retreat can't be explained without also factoring in an increase in global greenhouse gases, which he notes are overwhelmingly due to human activity. But whether the melt results from burning fossil fuels or deforestation, the end game appears unchanged.

"In about 30 or 40 years, most of the ice at the polar cap will be gone by the end of summer," said James Overland, an oceanographer at the National Oceanic and Atmospheric Administration in Seattle. "In the Arctic winter and spring, [the polar cap] will always have ice. But around the edges of the North Pole, north of Alaska and north of Europe, it'll be ice free well into November."

http://www.miller-mccune.com/environment/measuring-the-melting-arctic-sea-ice-18321

•Are We Making Bigger Hurricanes?

Fresh from surveying the detritus of storms past, our Kiri blogger reviews the case for and against human action making tropical storms bigger and more destructive.

By Kristian Beadle

In the south of Baja and mainland Mexico, summertime means tropical storms and hurricanes. In Mulegé, an unprecedented three floods occurred in four years, caused by rain-heavy hurricanes. People are claiming it is "global warming." But is it?

After the 2005 record-breaking season of monsters like Katrina, Wilma, and Dennis, hurricanes became the poster child of climate change. An Inconvenient Truth's image of a hurricane spewing out of a smoke stack seems to say: we are fueling our own self-destruction.

But I have to wonder, could my tailpipe emissions really create mega storms? If my home's electricity comes from a coal plants, does every time I turn on the light bulb — or take a shower with water pumped from far away dams, or buy food transported from other countries by trucks and ships, and so on – mean I'm contributing to the occasional destruction of a tropical island nation, or New Orleans, or Mulegé?

According to my review of current scientific thinking, the short answer is … probably, yes. But, we will never know for sure (and nuance in this field, as the story of Christopher Landsea demonstrated here, is not appreciated). It has been shown in multiple studies that greenhouse gases have increased the *intensity* of storms. Those claims are refuted by others who say data is inadequate.

Meanwhile, everyone tends to agree that the *frequency* of storms is constant or even decreasing (number of days of hurricane activity). One of the common problems is that *intensity* and *frequency* are used interchangeably, particularly in popular media. The most important fact, which isn't really scientific at all, is that the destructiveness of hurricanes is related more to our building patterns than our emissions, which may be a source of hope for the future.

The basic premise is that greenhouse gases increase the temperature of the atmosphere, and subsequently, sea surface temperatures through mixing. Warmer seas also generate more water vapor by the process of evaporation. Tropical storms are fueled by heat and water vapor, which in higher amounts (generally) creates stronger winds and more rain. With the right conditions, tropical storms can turn into hurricanes.

In the last 15 years, scientists have vigorously researched whether and why hurricanes have become more powerful. Kerry Emanuel, an atmospheric scientist from Massachusetts Institute for Technology, has shown that in the last 30 years the destructive potential of hurricanes has roughly doubled in both the North Atlantic and North Pacific, since storms are lasting longer and have greater wind speeds, in large part due to increased sea surface temperatures. Historical data from the European Centre for Medium- Range Weather Forecasts confirmed Emanuel's finding. Researchers at University of Virginia looking at historical wind speeds also determined that water temperatures of 83 degrees Fahrenheit might be a tipping point for major hurricane

development (Category 3 or higher) and concluded that “rising sea surface temperature will act to increase the percentage of major hurricanes” — although not necessarily the ultimate intensity of the storms, which is a result of other complex factors.

Could natural variability be responsible for the warmer water and bigger storms, instead of greenhouse gases?

There is speculation that during the last 20 years the increases in sea temperatures in the North Atlantic can be attributed to a phenomenon known as the Atlantic Multi-decadal Oscillation. Remembering that the North Atlantic only counts for about 11 percent of hurricanes around the world, researchers from the Georgia Institute of Technology surveyed all six hurricane regions in the world and found that although the total annual number of hurricanes hasn’t changed significantly (i.e. frequency), the percentage of intense storms (Category 4 or 5) has increased – from 20 percent in the early 1970s to 35 percent in the 1990s.

The global increase in hurricane intensity suggests it is not only an Atlantic phenomenon. A study by the National Center for Atmospheric Research on the infamous hurricane season of 2005 showed that the Atlantic Multi-decadal Oscillation did play a role in that year’s warm water, but it was only responsible for 10 percent of the increased temperature. Meanwhile, 25 percent was due to excess heat from the previous season’s *El Niño*, 20 percent from natural year-to-year variation, and the remaining 45 percent was attributed to greenhouse gas-induced warming.

The El Niño phenomenon, as suggested above, can play a role in the formation of North Atlantic hurricanes. The *El Niño* moves warm water in the Pacific Ocean from west to east, generating excess heat that can intensify the *following* season’s hurricanes in the North Atlantic. However, the *El Niño* is also associated with high wind shear, which actually dismantles the convective energy of hurricanes in the Atlantic Ocean – low wind shear is one of the factors needed for the hurricane vortex to form. Hence, during *El Niño* years, North Atlantic hurricanes are expected to be less frequent.An equally dizzying array of studies is published that refutes the claims made above. Most hinge on a few key issues. First, pre-satellite hurricane wind speed data is unreliable because different monitoring techniques were used. Arcane discussions prevail, like whether “radio silence” in warships during World War II might have underestimated the intensity of storms. Second, the natural variability question (i.e. the Atlantic Multi-decadal Oscillation) isn’t resolved which means there is “too much uncertainty” in drawing conclusions about the last two decades. Third, year-to-year observations (often in media of lesser credibility) say that since sea surface temperatures are cooler this year or this season’s hurricane season is very

Clearly some of these refutations are more valid than others, but the popular media tends to pick them up as truisms. Articles are published with titles such as Climate myths: Hurricane Katrina was caused by global warming, from New Scientist, which does make some valid points; while Stormy Times for Global Warmists: Hurricanes, it turns out, are not caused by climate change, in Forbes magazine, is just hot air, no pun intended. Proving or disproving the connection is both equally difficult and blanket statements are misleading.The issue has become overly political, the science at its limits. Perhaps this is just as well, since the answer should come from society. After all, what do we really need? One of the specialists of the economic costs of hurricanes, Roger Pielke Jr., says the global warming and hurricane connection is “tenuous” at best. Even if it were the case, he reasons, the destruction caused by hurricanes is simply because *more people are living by the coast.* Population growth and wealth are 20 times more important than global warming, he says, in creating the conditions for catastrophe.If so, what is the best way to deal with hurricanes, by reducing carbon dioxide emissions or with better building codes in coastal areas? The best bets for reducing damage in the future may be with stronger buildings, restoring wetlands and dunes, and good flood management. The threat of bigger storms, whatever the reason, may be enough to persuade coastal communities to think before making development mistakes – and to restore protective ecosystems they didn’t value before.

http://www.miller-mccune.com/environment/are-we-making-bigger-hurricanes-18168

•The Poverty Solution: Cash

A new book, "Just Give Money to the Poor," says the poor will spend the cash wisely and boost the economy, too.

By Melinda Burns

Who's responsible for the poor?

Back in the reign of the first Queen Elizabeth, English lawmakers said it was the government and taxpayers. They introduced the compulsory "poor tax" of 1572 to provide peasants with cash and a "parish loaf." The world's first-ever public relief system did more than feed the poor: It helped fuel economic growth because peasants could risk leaving the land to look for work in town.

By the early 19th century, though, a backlash had set in. English spending on the poor was slashed from 2 percent to 1 percent of national income, and indigent families were locked up in parish workhouses. In 1839, the fictional hero of Oliver Twist, a child laborer who became a symbol of the neglect and exploitation of the times, famously raised his bowl of gruel and said, "Please, sir, I want some more."

Today, child benefits, winter fuel payments, housing support and guaranteed minimum pensions for the elderly are common practice in Britain and other industrialized countries. But it's only recently that the right to an "adequate" standard of living has begun to be extended to the poor of the developing world.

In an urgent new book, Just Give Money to the Poor: The Development Revolution from the Global South, three British scholars show how the developing countries are reducing poverty by making cash payments to the poor from their national budgets. At least 45 developing nations now provide social pensions or grants to 110 million impoverished families — not in the form of charitable donations or emergency handouts or temporary safety nets but as a kind of social security. Often, there are no strings attached.

It's a direct challenge to a foreign aid industry that, in the view of the authors, "thrives on complexity and mystification, with highly paid consultants designing ever more complicated projects for 'the poor'" even as it imposes free-market policies that marginalize the poor.

"A quiet revolution is taking place based on the realization that you cannot pull yourself up by your bootstraps if you have no boots," the book says. "And giving 'boots' to people with little money does not make them lazy or reluctant to work; rather, just the opposite happens. A small guaranteed income provides a foundation that enables people to transform their own lives."

There are plenty of skeptics of the cash transfer approach. For more than half a century, the foreign aid industry has been built on the belief that international agencies, and not the citizens of poor countries or the

poor among them, are best equipped to eradicate poverty. Critics concede that foreign aid may have failed, but they say it's because poor countries are misusing the money. In their view, the best prescription for the developing world is a dose of discipline in the form of strict "good governance" conditions on aid.

Joseph Hanlon, a senior lecturer in development at the Open University in Milton Keynes, and Armando Barrientos and David Hulme, professors of poverty and development studies, respectively, at the University of Manchester, England, and directors of the Brooks World Poverty Institute there, back up their conclusions in *Just Give Money* with a wealth of studies on cash transfer programs, many of them conducted by the skeptical foreign aid community, including such global micromanagers as The World Bank and International Monetary Fund.

According to The World Bank, nearly half the world's population lives below the international poverty line of $2 per day. As the authors of *Just Give Money* point out, that's despite decades of top-down, neo-liberal, extreme free-trade policies that were supposed to "lift all boats." In Africa, South Asia and other regions of the developing "South," the situation remains dire. Every year, according to the United Nations, more than 9 million children die before they reach the age of 5, and malnutrition is the cause of a third of these early deaths.

Just Give Money argues that cash transfers can solve three problems because they enable families to eat better, send their children to school and put a little money into their farms and small businesses. The programs work best, the authors say, if they are offered broadly to the poor and not exclusively to the most destitute.

"The key is to trust poor people and directly give them cash — not vouchers or projects or temporary welfare, but money they can invest and use and be sure of," the authors say. "Cash transfers are a key part of the ladder that equips people to climb out of the poverty trap."

Brazil, a leader of this growing movement, provides pensions and grants to 74 million poor people, or 39 percent of its population. The cost is $31 billion, or about 1.5 percent of Brazil's gross domestic product. Eligibility for the family grant is linked to the minimum wage, and the poorest receive $31 monthly. As a result, Brazil has seen its poverty rate drop from 28 percent in 2000 to 17 percent in 2008. In northeastern Brazil, the poorest region of the country, child malnutrition was reduced by nearly half, and school registration increased.

South Africa, one of the world's biggest spenders on the poor, allocates $9 billion, or 3.5 percent of its GDP, to provide a pension to 85 percent of its older people, plus a $27 monthly cash benefit to 55 percent of its children. Studies show that South African children born after the benefits became available are significantly taller, on average, than children who were born before.

"None of this is because an NGO worker came to the village and told people how to eat better or that they should go to a clinic when they were ill," the book says. "People in the community already knew that, but they never had enough money to buy adequate food or pay the clinic fee."

In Mexico, an average grant of $38 monthly goes to 22 percent of the population. The cost is $4 billion, or 0.3 percent of Mexico's GDP. Part of the money is for children who stay in school: The longer they stay, the larger the grant. Studies show that the families receiving these benefits eat more fruit, vegetables and meat, and get sick less often. In rural Mexico, high school enrollment has doubled, and more girls are attending.

India guarantees 100 days of wages to rural households for unskilled labor, paying at least $1.25 per day. If no work is available, applicants are still guaranteed the minimum. This modified "workfare" program helps small farmers survive during the slack season.

Far from being unproductive, the book says, money spent on the poor stimulates the economy "because local people sell more, earn more and buy more from their neighbors, creating the rising spiral."

Pensioner households in South Africa, many of them covering three generations, have more working people

than households without a pension. A grandmother with a pension can take care of a grandchild while the mother looks for work.

Ethiopia pays $1 per day for five days of work on public works projects per month to people in poor districts between January and June, when farm jobs are scarcer. By 2008, the program was reaching more than 7 million people per year, making it the second largest in sub-Saharan Africa, after South Africa. Ethiopian recipients of cash transfers buy more fertilizer and use higher-yielding seeds.

“In other words,” the book says, “without any advice from aid agencies, government, or nongovernmental organizations, poor people already knew how to make profitable investments. They simply did not have the cash and could not borrow the small amounts of money they needed.”

Just Give Money is lucidly written, but it bogs down when it explores the complex ins and outs of designing cash-transfer programs. In effect, the authors are combining a book for general readers with a book for policymakers. But there are helpful summaries for the layman at the end of every chapter, and some of the debates are fascinating.

For example, there’s the question of whether mothers who receive grants should be required to attend health talks and perform community work, as they are in Mexico and Brazil. On one hand, these rules could be viewed as reinforcing the view that mothers must sacrifice themselves for their children. On the other, studies show that many of the women had been confined at home by their husbands and welcomed the chance to get out.

Just Give Money does not put much stock in micro-credit programs that loan money to the poor in developing countries. Many people are too poor to take on the risk of paying back a loan, the authors say. They find fault with the U.N.’s Millennium Development Goals, too, saying these have “kept governments at arm’s length from the economy.”

A better way for donor countries to help, the authors suggest, is to give aid as “general budget support,” funneling cash for the poor directly into government coffers.

Cash transfers are not a magic bullet. *Just Give Money* notes that 70 percent of the 12 million South Africans who receive social grants are still living below the poverty line. In Brazil, the grants do not increase vaccinations or prenatal care because the poor don’t have access to health care. A scarcity of jobs in Mexico has forced millions of people to emigrate to the U.S. to find work. *Just Give Money* emphasizes that to truly lift the poor out of poverty, governments also must tackle discrimination and invest in health, education and infrastructure.

The notion that the poor are to blame for their poverty persists in affluent nations today and has been especially strong in the United States. Studies by the World Values Survey between 1995 and 2000 showed that 61 percent of Americans believed the poor were lazy and lacked willpower. Only 13 percent said an unfair society was to blame.

But what would Americans say now, in the wake of the housing market collapse and the bailout of the banks? The jobs-creating stimulus bill, the expansion of food stamp programs and unemployment benefits — these are all forms of cash transfers to the needy.

Just Give Money says cash helps people “see a way out,” no matter where they live.

http://www.miller-mccune.com/business-economics/the-poverty-solution-cash-16977/

•Prisoners of the States

A new book, "The Enemy In Our Hands," looks at how America has treated — and mistreated — prisoners of war through history resonates in the age of terror.

By Erik Hayden

In March 2004, the Abu Ghraib scandal seared unsightly images of prisoner abuse into the consciousness of a new generation of Americans. The allegations blindsided citizens who — galvanized by the specter of a nuclear Saddam — had been mostly supportive of the pre-emptive invasion of Iraq. Not since the Mai Lai massacre in Vietnam 42 years earlier had so many questioned whether the nation held higher moral ground than its enemies.

Despite the courts-martial of the guards involved, the ensuing media frenzy only muddled the policy debate regarding the status of "unlawful combatants." The incoming Obama administration promised change, but it has achieved little so far on the terror-suspect front. Attorney General Eric Holder's announcement that he would try 9/11 "mastermind" Khalid Shaikh Mohammed in a New York federal court ran into congressional and local opposition, and now it's unclear whether he will be tried in a civilian court or a military tribunal. And the president has only ceremonially closed the prison facilities at Guantanamo Bay.

Inserting itself deftly into the current debate is The Enemy In Our Hands, the latest book from Robert C. Doyle, a history professor at Franciscan University of Steubenville, Ohio, and a Vietnam War veteran. With the very definition of "torture" subject to partisan politics, the author is content to objectively relay the precedents that shaped America's treatment of captured enemies without pointing fingers or making sweeping judgments.

What readers are left with is a lively primer illuminating the people, events and prejudices that have shaped the government's handling of prisoners of war and homegrown political dissidents over time. In chronological order, Doyle marches through American history from the Revolutionary War to the skirmishes with the Plains Indians all the way through more famous and deadlier conflicts of the 20th century.

How have Americans treated foreign prisoners of war? In general, fairly well, if they are uniformed and have made it off the battlefield into prison camps.

The first shots fired during the American Revolution introduced what the author describes as the dichotomy of prisoners of war and prisoners of state. The POWs held by Americans — British and Hessian troops — were treated mostly with restraint and respect during their time in captivity. American-born loyalists — those who,

out of political or economic necessity, were devoted to the British Crown — did not receive such sympathy. Doyle writes that many were subjected to a series of loyalty tests then hounded out of their homes and stripped of their property. Some headed north to Canada while others were subsequently recruited by the British (who enlisted nearly 50,000 of these sympathizers).

These early actions "set the stage for what would take place repeatedly in American military history." Namely, the military tends to treat foreign prisoners of war humanely, but internal prisoners, especially Americans perceived as disloyal, face a host of troubles.

These troubles, for the most part, came swiftly to those who committed treason. The Irish turncoats in the Saint Patrick's Battalion, a band of deserters who fought for Mexico during the Mexican-American War, were promptly hanged upon being captured. Other notable and fascinating treason cases described in the book include those of the infamous German and Japanese propaganda voices of World War II, "Axis Sally" and "Tokyo Rose." Both American citizens, these radio personalities were later tried and sentenced to more than a decade in prison and fined substantially. Unfortunately, American perceptions of disloyalty have also encompassed far more than clear treason — and at times have attached to groups whose primary offense appears to have been ethnicity, including Japanese-Americans taken from their homes along the Pacific Coast and sent to internment camps during World War II.

After the Revolutionary War, prisoner treatment was inconsistent. During the early 1800s, the U.S. and its enemies had few overarching agreements on POW procedures, and many prisoners were subjected to the whims of the officers who captured them. If the capturing general were George Washington during the revolution or Zachary Taylor during the Mexican-American War, chances are that prisoners were treated humanely and, in some cases, paroled (i.e., sent home with the agreement that they would not rejoin the fight). This was especially true during the Mexican-American War — the U.S. military had no place to put their prisoners and parole became a prominent option.

It wasn't until 1863, during the Civil War, that the U.S. reformed its POW policy by introducing General Order 100. This order (also known as the Lieber Code, for its author, Francis Lieber, who had sons fighting on both sides of the war) reinvented the way prisoners of war were kept and treated. Instead of being the prisoner of a specific general, POWs became prisoners of the U.S. government and were afforded a certain list of rights — including the right not to be tortured.

Although the Confederacy at first considered the order Northern propaganda, Gen. Robert E. Lee sagely recognized the value in the document. The timing was good as the war was quickly escalating into a "catastrophe of uncontrolled, retributive bloodletting." Even this new protocol couldn't stave off unnecessary deaths in poorly maintained prisoner of war camps — such as the infamous camp in Andersonville, Ga. — that became cesspools for disease and rife with abuse.

Still, according to Doyle, General Order 100 became one of the true innovations of the 1800s and set the stage for the international community to follow suit with the landmark Hague and Geneva conventions in 20th century.

The most striking stories in *The Enemy In Our Hands* arrive in the chapter titled "War in the Philippines" — what the author calls "the hardest chapter to write" because of the complexity of the events involved. In this conflict, which followed the Spanish-American War, the limits of General Order 100 were tested, and U.S. officers may have turned a blind eye to torture. The violence of what became an insurrection in the Philippines proved to foreshadow the messy conflicts in Vietnam and the Middle East.

After the relative ease of victory against the Spanish in Cuba in 1898, the U.S. turned to the Philippines, seeking to assimilate the islands. Spurned by American officials, resistance forces, led by Emilio Aguinaldo, refused to recognize U.S. sovereignty and began a guerrilla war.

Although the American soldiers in the Philippines were subject to General Order 100, article 81 of that order

denied POW status to “nonuniformed enemy fighters who conducted hostilities.” Doyle notes that this type of fighting made some American soldiers feel as if they were fighting another frontier Indian war — which meant, in essence, that there were no rules.

As the conflict wore on (nearly 4,200 American soldiers were killed during the three-year-long guerrilla war), frustrated U.S. soldiers were caught between their duties to obtain field intelligence and, also, to treat prisoners humanely. They interrogated prisoners harshly; their commanding officers turned a blind eye, but also issued orders against physical abuse of prisoners. “Americans were damned by the law if they used unconventional methods,” Doyle writes, “and damned by the failure to obtain hard field intelligence if they refrained.”

According to historian Brian McAllister Linn, who is cited in the book, the interrogation method of choice in the Philippines was the “water cure” — what Doyle refers to as a “medieval” version of the practice that current-day Americans know as waterboarding. In the water cure, a prisoner was forced to drink dirty water until his stomach was about to explode, then asked a question. If the response was unsatisfactory, the prisoner was kicked until he vomited all the water out and the process was repeated.

Doyle doesn’t spend time debating the effectiveness of the water cure or its slightly more humane modern cousin, but he does write that skilled interrogators got the answers they were looking for from prisoners after about 30 seconds of waterboarding. Perhaps tellingly, the author doesn’t mention whether the prisoners gave usable information or just told interrogators what they wanted to hear.

He writes about the interrogations: “Moral? No. Lawful? No. Effective? Absolutely.”

When Capt. J.A. Ryan was court-martialed in the Philippines for dunking prisoners’ heads into a barrel of water, he responded, “To say that under such circumstances as these, [the] ducking of the heads into a pail of water was unlawful is to my mind crying out ‘Law’ where there is no law.”

Surely, some Vietnam veterans and a few soldiers currently in Afghanistan or Iraq would agree.

When the Bush administration denied non-state, nonuniformed enemy combatants the right to be held by the standards of the 1949 Geneva Convention, it did so convinced that the decision would make America safer. Even the well-publicized dissent of Colin Powell couldn’t change the mind of Secretary of Defense Donald Rumsfeld and the neo-conservatives who held sway with the president.

Robert C. Doyle doesn’t argue whether or not changing the rules was necessary after the events of 9/11, only that there was a painful cost to the decision. The tangible losses included abandonment by European and other coalition states during the occupation in Iraq and a blow to American prestige around the world.

The low-level guards at the understaffed, ill-maintained prison facilities at Abu Ghraib are only partly to blame for the despicable abuses that occurred in March of 2004. The Bush administration had sought and received Justice Department opinions that explicitly allowed interrogators to go beyond the limits set by the Geneva Conventions on the treatment of prisoners of war. But the rules for treatment of captured unlawful combatants in Afghanistan, in Guantanamo, and in Iraq remain murky, at best.

Though it may be a pipe dream, *The Enemy In Our Hands* argues that a new, stronger international convention on prisoners is necessary to establish the rules of war for the 21st century. At the very least, this well-balanced book showcases the difficulty of even defining what Doyle calls “that elusive term enemy.”

http://www.miller-mccune.com/culture/prisoners-of-the-states-16732

•In a World of Throwaways, Making a Dent in Medical Waste

●By INGFEI CHEN

The health care industry has a garbage problem.

It's not just that hospitals, doctors' offices, clinics and other health facilities generate several billion pounds of garbage each year: buried in that mountain of trash are untold numbers of unused disposable medical devices as well as used but recyclable supplies and equipment, from excess syringes and gauze to surgical instruments.

The problem, fueled by a shift toward the use of disposables that made it simple to keep treatment practices sterile, has been an open secret for years, but getting the health care industry to change its habits has not been easy. No organization currently tracks how much medical trash the United States produces — the last known estimate, from the early 1990s, was two million tons a year.

Only recently has the industry begun grappling with the amount of waste it generates, and one reason is that financially stressed hospitals are seeking ways to cut costs.

"We've just seen a sea change," said Cecilia DeLoach Lynn, director of sustainability education at Practice Greenhealth, a nonprofit group in Reston, Va., that is working to shrink the environmental footprint of health care institutions.

"Once upon a time, you had to do a lot of door-knocking to get anybody to pay attention," Ms. DeLoach Lynn said. "These days, folks are asking us not whether or not they should be doing it, but how." Practice Greenhealth's members include around 1,100 hospitals and 80 companies.

Now, a new movement is taking aim at one of the biggest sources of medical refuse — the operating room, which churns out roughly 20 to 30 percent of a hospital's waste.

At a symposium in Baltimore in May, Practice Greenhealth announced an initiative called Greening the O.R. It will explore and vet the best sustainable practices for reducing operating-room garbage, energy consumption and indoor air quality problems — while lowering expenses and improving safety, Ms. DeLoach Lynn said.

Eliminating the squandering of medical supplies and equipment can save on new purchases as well as incineration and landfill fees. Some institutions have turned to interventions like reducing their use of materials, recycling what they do use, and donating leftover but still usable items to developing nations.

In a commentary published in March in Academic Medicine, Dr. Martin A. Makary, a gastrointestinal surgeon, and colleagues at Johns Hopkins School of Medicine called for more medical centers to "go green" by recycling disposable single-use medical devices. Several reprocessing companies take certain disposables — like orthopedic drill bits and heart-monitoring catheters — and clean, recalibrate, repackage and resterilize them, then sell them back to hospitals and medical suppliers for 40 to 60 percent of the price of new ones.

The commentary stemmed in part from a frustrating moment two years ago when Dr. Makary stared into a trash bin in the operating room after performing routine laparoscopic "keyhole" surgery. As is typical in most hospitals, the wastebasket was full of "perfectly good equipment, much of which was either barely used or never used," he recalled. The unused devices came from sterilized surgical kits that were opened for the operation; no longer sterile, they got tossed.

Until fairly recently, most medical devices — made from durable metal, glass or rubber — could be disinfected for countless reuses. In the 1980s, however, the health care industry began shifting to single-use versions, often made from inexpensive plastics, partly because the emerging H.I.V. epidemic raised fears about the risks of recycling equipment.

Although it soon became clear that sterilization techniques readily killed the virus, the trend toward disposables kept growing. At Hopkins, Dr. Makary noticed more and more of his permanently reusable surgical tools being replaced by throwaways. It was, he said, a way "for the industry to make more money."

Some single-use devices can be reused after reprocessing, but a decade ago there was great consternation that inadequately decontaminated products might cause infections. Or that cleaning and sterilization might erode their less durable components, leading to malfunction.

Original-equipment makers and their trade group, the Advanced Medical Technology Association, warned that it was unsafe to recycle devices designed to be used only once. But since 2000, the Food and Drug Administration has taken steps to require that reprocessing companies meet the same stringent regulations for their products that original-device makers do.

But lingering safety concerns slowed the adoption of reprocessing. To investigate those fears, Gifty Kwakye, then a graduate student at Hopkins, worked with Dr. Makary and a colleague, Dr. Peter J. Pronovost, in combing the medical literature for evidence that patients were harmed by recycled devices.

They found none. A report by the Government Accountability Office in 2008 said that the available data indicated no additional health risk from reprocessed disposables. Reprocessing "has a reliable safety record of excellence identical to that of new equipment," the Hopkins researchers concluded in their commentary. Their own hospital contracts with a company to reprocess some of its equipment and is discussing what it could add to the list, Dr. Makary said.

David Nexon, senior executive vice president of the Advanced Medical Technology Association, acknowledged that with increased oversight, where devices have won F.D.A. clearance based on review of additional data validating their safety and effectiveness after being reprocessed, the products are now "probably pretty safe." Still, Mr. Nexon questioned the safety of recycled products for which F.D.A. does not require such data.

But Karen Riley, an F.D.A. spokeswoman, said that only a minority of reprocessed devices were exempt from the requirement for extra validation data, because they posed a low safety risk. They include blood pressure cuffs and other devices that may touch the skin but not penetrate it.

Many organizations, from Practice Greenhealth to the American College of Cardiology, support reprocessing

as a safe strategy. Today, more than half the country's hospitals send at least some of their single-use devices to reprocessors, said Daniel J. Vukelich, president of the Association of Medical Device Reprocessors. The group represents Ascent Healthcare Solutions and SterilMed, the two companies that perform about 95 percent of reprocessing in the United States.

Ascent estimates that its 1,800 hospital clients diverted 2,650 tons of garbage from landfills in 2009; one major customer, the Hospital Corporation of America, which owns 163 hospitals, eliminated 94 tons of waste last year through reprocessing.

But while recycling is helpful, even reprocessed disposables must eventually must be thrown away, said Dr. Rafael Andrade, a general thoracic surgeon at the University of Minnesota Medical Center, Fairview, who spoke at the recent Practice Greenhealth workshop. The bigger goal, he said, should be to resume the old practice of relying on permanently reusable equipment. "We're just trying to undo a lot of the damage we've done," Dr. Andrade said.

For now, another approach is to cut back the use of disposables at the source by streamlining packaged surgical kits. Last year, Dr. Andrade and a nurse, Lynn Thelen, started an "O.R. green team" at Fairview. With input from colleagues, they scrutinized 38 types of operating room packs, figured out which supplies were never used (like plastic basins, catheters, syringes and dressings), and asked their medical product vendor to remove them.

One kit for implanting an intravenous port in chemotherapy patients contained 44 items, but the green team downsized it to 27 items and swapped disposable gowns and linens for reusable ones. That trimmed a pound of trash and $50 in supply costs per procedure. So far, Ms. Thelen said, the various kit reformulations have prevented 7,792 pounds of waste and saved $104,658.

Similarly, at Rochester General Hospital in upstate New York, surgeons have agreed to use standardized supply kits selected to cover most of their needs while leaving little unused,said Dr. Ralph Pennino, the chief of plastic surgery. The goal has been to "work systems out so we don't have anything to reprocess," he said.

Leftover items are donated to InterVol, a nonprofit organization started in 1989 by Dr. Pennino. Each week, its volunteers gather about 8,000 pounds of unused supplies and reusable equipment from regional health care facilities, then ship the stock to clinics in more than two dozen countries, including Somalia and Haiti.

"Anything we collect would have been disposed of," Dr. Pennino said — hospital beds, operating tables, crutches and, in one case, tens of thousands of brand-new hypodermic needles. Other humanitarian relief groups, like Project C.U.R.E., do similar work. After the Haitian earthquake in January, one of InterVol's business sponsors lent two corporate jets to fly in teams of doctors and nurses and 8,000 pounds of supplies, said Dr. Pennino, who participated in medical relief efforts in Léogâne, near the quake's epicenter.

Sometimes, medical donations are a one-person campaign, as in the case of Scott Barlow, a nurse at the clinic at Yosemite National Park in California. Mr. Barlow volunteered in two long stints during the last two years at Gimbie Adventist Hospital, based in a poverty-stricken town in Ethiopia where children die from starvation and rickets. Currently back in California, Mr. Barlow scrounges what he can to send to Ethiopia, including scissors and unused excess dressings from the medical kits used at the Yosemite clinic.

On his first missionary trip with family and friends in 2008, Mr. Barlow took along a small trove of old equipment, including two microscopes, a centrifuge and blood-analysis machines donated by Doctors Medical Center in Modesto, Calif. "We just packed our luggage as full as we could with that kind of stuff," Mr. Barlow said. "Everything I brought, they needed."

http://www.nytimes.com/2010/07/06/health/06waste.html?_r=1&nl=health&emc=healthupdateema2

•Getting a New Knee or Hip? Do It Right the First Time

●By LESLEY ALDERMAN

THERE is nothing like a new hip or knee to put the spring back in your step. Patients receiving joint implants often are able to resume many of the physical activities they love, even those as vigorous as tennis and hiking. No wonder, then, that joint replacement is growing in popularity.

In the United States in 2007, surgeons performed about 806,000 hip and knee implants (the joints most commonly replaced), double the number performed a decade earlier. Though these procedures have become routine, they are not fail-safe.

Implants must sometimes be replaced, said Dr. Henrik Malchau, an orthopedic surgeon at Massachusetts General Hospital in Boston. A study published in 2007 found that 7 percent of hips implanted in Medicare patients had to be replaced within seven and a half years.

The percentage may sound low, but the finding suggests that thousands of hip patients eventually require a second operation, said Dr. Malchau. Those patients must endure additional recoveries, often painful, and increased medical expenses.

The failure rate should be lower, many experts agree. Sweden, for instance, has a failure rate estimated to be a third of that in the United States.

Sweden also has a national joint replacement registry, a database of information from which surgeons can learn how and why certain procedures go awry. A registry also helps surgeons learn quickly whether a specific type of implant is particularly problematic. “Every country that has developed a registry has been able to reduce failure rates significantly,” said Dr. Daniel Berry, chief of orthopedic surgery at the Mayo Clinic in Rochester, Minn.

A newly formed American Joint Replacement Registry will begin gathering data from hospitals in the next 12 to 18 months.

Meanwhile, if you are considering replacing a deteriorating knee or hip, here are some ways to raise the chances of success and avoid a second operation.

EXPERIENCE COUNTS Choose — or request a referral to — an experienced surgeon at a busy hospital. “The most important variable is the technical job done by the surgeon,” said Dr. Donald C. Fithian, an orthopedic surgeon and the former director of Kaiser Permanente’s joint replacement registry.

Ask for recommendations from friends who have had successful implants and from doctors you know and trust. When you meet with the surgeon, ask how many replacements he or she does each year.

VOLUME MATTERS A study published in The Journal of Bone and Joint Surgery in 2004 found that patients receiving knee replacements from doctors who performed more than 50 of the procedures a year had fewer complications than patients whose surgeons did 12 procedures or fewer a year.

The researchers documented a similar trend when it came to hospital volume. Patients at hospitals that performed more than 200 knee replacements a year fared better than patients at hospitals that performed 25 or fewer.

ADJUST EXPECTATIONS Not everyone with joint pain will benefit from a joint replacement.

An implant can help reduce pain and improve mobility if the joint surface is damaged by arthritis, for instance. But a new joint will not help pain caused by inflammation of the surrounding soft tissue, said Dr. Berry, who is also vice president of the board of the American Academy of Orthopaedic Surgeons. Some people with mildly arthritic joints, for instance, can manage well with the judicious use of medication. "Surgery comes with complications and risks, and should not be approached lightly," Dr. Berry said. Joint replacement is not a minor operation. If you have uncontrolled high blood pressure or another serious chronic condition, a joint operation may simply be too risky for you.

NARROW YOUR OPTIONS "There is no one best joint," Dr. Berry said. "A successful replacement depends on selecting the right implant for the patient."

A good surgeon will recommend an implant that makes sense for your age, activity level and the shape of your joint. Younger or very active people who place more physical demands on the implant, for instance, may benefit from newer hard-on-hard bearing surfaces, like those made of ceramic, said Dr. Joshua J. Jacobs, chair of orthopedic surgery at Rush University Medical Center in Chicago. In general, be wary of the latest, most advanced new joint. There is little evidence to support the use of more expensive designs over basic ones, said Dr. Tony Rankin, a clinical professor of orthopedic surgery at Howard University. One recent study found that premium implants fared about as well as standard implants over a seven- to eight-year period. Be skeptical, too, of advertising gimmicks. "I had a 78-year-old patient with a perfectly good knee replacement come in and ask if she should have gotten the 'gender knee,' which she had seen advertised on TV," Dr. Rankin recalled. "She was doing well, but was swayed by the idea of a knee made just for women."

GATHER THE DATA Once you have a recommendation or two from a surgeon, find out how well the joint has performed in others and if there are known complications. The newer metal-on-metal hip implants, for instance, are somewhat controversial and may cause tissue and bone damage in certain patients.

Ask if the hospital has a registry that tracks joint replacements. If so, ask to see the data on the implants you are considering. It is also helpful to understand what the operation involves, including the materials that will be used and how the surgeon plans to fix the joint to the bone. You can learn more about your operation at the American Academy of Orthopaedic Surgeon's patient information Web site, orthoinfo.org. If you want to delve deeper, look at a large national registry from another country, like Australia (which can be found at dmac.adelaide.edu.au/aoanjrr/publications.jsp). The annual report of Australia's registry lists knee and hip implants that had a "higher than anticipated revision rate."

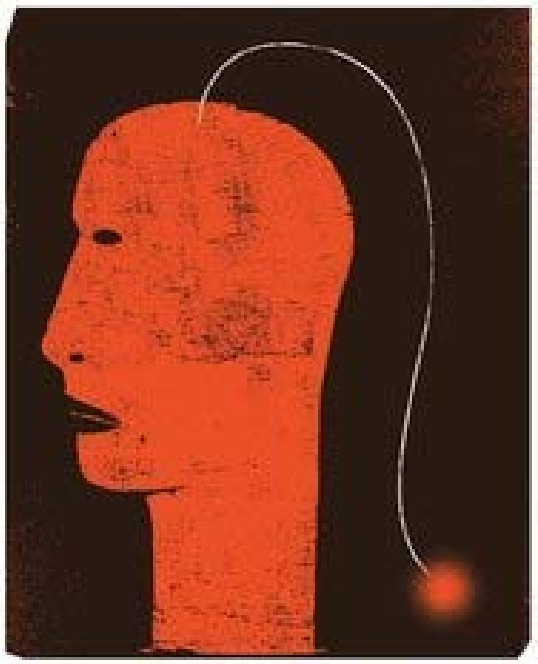
A caveat: the information can be difficult to parse for a layperson. "A surgeon can provide perspective on information that, taken out of context, could be misleading," Dr. Rankin said. So discuss it with your surgeon.

PLAN YOUR RECOVERY To avoid complications during your final stage of recuperation, discuss with your doctor in advance the support you will need when you return home, Dr. Berry advised.

Recovery takes a different course for each patient, depending on the type of procedure and implant. In general, expect mild to moderate pain for the first few weeks. Some patients are able to return to work in one to two weeks, but full recovery can take six to 12 months, Dr. Jacobs said. Make sure you have the help you need in the initial stages of recuperation. Since you may have difficulty getting around and won't be able to drive right away, you may want to have a friend or family member stay with you. You may even need to hire an aide or visiting nurse. Follow your doctor's orders, and don't rush your recovery. You don't want your new joint to fail because you couldn't resist carrying loads of laundry up and down stairs, or felt compelled to rearrange the patio furniture. If the new joint is given time to heal, you will find plenty of opportunities for all that in the future.

http://www.nytimes.com/2010/07/03/health/03patient.html?nl=health&emc=healthupdateema4

•The Benefits of Blowing Your Top



●By BENEDICT CAREY

The longing for President Obama to vent some fury at oil executives or bankers may run far deeper than politics. Millions of people live or work with exasperatingly cool customers, who seem to be missing an emotional battery, or perhaps saving their feelings for a special occasion. People who — unlike the mining operators in the gulf — have a blowout preventer that works all too well.

Sang-froid has its place, especially during a crisis; but so does Sigmund Freud, who described the potential downside of suppressed passions. Those exhortations being directed at the president could be just as easily be turned on countless co-workers, spouses, friends (or oneself):

Lose it. Just once. See what happens.

“One reason we’re so attuned to others’ emotions is that, when it’s a real emotion, it tells us something important about what matters to that person,” said James J. Gross, a psychologist at Stanford University. When it’s suppressed or toned down, he added, “people think, damn it, you’re not like us, you don’t care about the same things we do.”

Rigorous study of what psychologists call emotion regulation is fairly new, and for obvious reasons has focused far more on untamed passions than on the domesticated variety. Runaway emotion defines many mental disorders, after all; restraint is typically associated with good mental health, from childhood through later life.

Yet social functioning is a different matter. Research in the past few years has found that people develop a

variety of psychological tools to manage what they express in social situations, and those techniques often become subconscious, affecting interactions in unintended ways. The better that people understand their own patterns, the more likely they are to see why some emotionally charged interactions go awry — whether from too little control or, in the president's case, perhaps too much.

Most scientists agree that a person's range of possible emotional expression is a matter of inborn temperament. Growing up is, in one sense, a living education in how to manage that temperament so it elicits help from others and does not torment oneself.

"As we grow, the prefrontal areas of the brain develop, and we become more biologically able to control our impulses as well," said Stefan G. Hofmann, a professor of psychology at Boston University.

Psychologists divide regulation strategies into two broad categories: pre-emptive, occurring before an emotion is fully felt; and responsive, coming afterward. The best known of the latter category, and one of the first learned, is simple suppression. First-graders will cover a smile with their hand when a classmate does something embarrassing; in time, many become far more adept, reflexively masking surprise, alarm, even rage with a poker face.

Suppression, while clearly valuable in some situations (no laughing at funerals, please), has social costs that are all too familiar to those who know its cold touch. In one 2003 Stanford study, researchers found that people instructed to wear a poker face while discussing a documentary about the atomic bombings of Hiroshima and Nagasaki made especially stressful conversation partners.

In another, published last year, psychologists followed 278 men and women as they entered college, giving questionnaires and conducting interviews. Those who scored highest on measures of emotion suppression had the hardest time making friends.

"An individual who responds to the college transition by becoming emotionally guarded in the first few days," the authors wrote, will most likely miss opportunities for friendships.

Pre-emptive techniques can work in more subtle ways. One of these is simple diversion, reflexively focusing on the good and ignoring the bad — rereading the praise in an evaluation and ignoring or dismissing any criticism. A 2009 study led by Derek Isaacowitz of Brandeis University found that people over 55 were much more likely than those aged 25 and under to focus on positive images when in a bad mood — thereby buoying their spirits. The younger group was more likely to focus on negative images when feeling angry or down.

More striking, Dr. Isaacowitz found in another study that older people were twice as likely as younger ones to be "rapid regulators" — people whose mood bounced back quickly, sometimes within minutes, after ruminating on depressing memories.

"We have found in general that older people tend to regulate their emotions faster, and are not as motivated to explore negative information, to engage negative images, as younger people are," Dr. Isaacowitz said. "And it makes some sense, that younger adults would explore the negative side of things, that they need to and maybe want to experience them — to experience life — as they develop their own strategies to regulate."

Socially speaking, in short, the ability to shrug off feelings of disgust or outrage may suit an older group but strike younger people as inauthentic, even callous.

Finally, people may choose the emotions they feel far more often than they are aware — and those choices, too, can trip up social interactions. A series of recent experiments led by Maya Tamir, a psychologist at Hebrew University in Jerusalem and at Boston College, has found that people subconsciously prime themselves to feel emotions they believe will be most useful to them in an anticipated situation. The researchers call these instrumental emotions.

In one experiment, published last year, Dr. Tamir and Brett Q. Ford of Boston College prepared participants to

play a video game in which they would be hunted down by monsters. Before playing, the study volunteers rated what type of music they wanted to hear and what kind of autobiographical memories they preferred to recall.

They were much more likely to want to recall fearful memories, and to prefer to listen to ominous music, than others who were expecting to play a video game in which they would build a theme park or solve a simple puzzle. They were, the authors argue, adopting an emotion that would serve them well in the game.

Dr. Tamir has found similar results in a variety of situations, showing for example that people role-playing as landlords will ramp up their anger before confronting a tenant about late rent.

Mr. Obama's analytical composure probably comes so easily because it has repeatedly served him well, Dr. Tamir said.

"If staying calm and patient and confident is what has worked for you in crisis situations in the past," she said, "then subconsciously it may become automatic. And the more automatic it becomes, the less of the actual anger, or panic, you feel."

All of which makes it a treacherous task to express the real thing, at exactly the moment and pitch that people expect. For people like the president, said Dr. Gross of Stanford, it means throwing the switch on two psychological systems at once: the habitual, analytical one (power down) and the instrumental one (power up).

"If that process interrupts expression even a little, people notice," Dr. Gross said. "We have an exceptional capacity to track whether the timing and morphology of an emotion is correct."

The most socially skilled among us — those who project the emotions they intend, when they intend to — are not wedded to any one strategy, Dr. Hofmann argues. In a paper published last month with Todd Kashdan of George Mason University, he proposed that emotion researchers adopt a questionnaire to measure three components of regulation: concealing (i.e., suppression), adjusting (quickly calming anger, for instance) and tolerating (openly expressing emotion).

"These are each valuable strategies, in different situations," Dr. Hofmann said. "The people who get into trouble socially, I believe, are the ones who are inflexible — who stick to just one."

http://www.nytimes.com/2010/07/06/health/06mind.html?ref=health

•Hitting a Tiny Bull's-Eye Miles Under the Gulf

●By HENRY FOUNTAIN

HOUSTON — To hear the people at Baker Hughes tell it, a drill string — length after length of narrow pipe that can extend for miles into the earth — is far from a rigid assembly of high-strength steel. It is more like a wet noodle.

"The challenge is not to get it to bend," said Aravindh Kaniappan, a product manager for Baker Hughes, a drilling equipment and services company. "It's to get it to not bend."

Because a string of drill pipe, along with the rotating bit at its cutting end, tends to go this way and that, drillers need critical information about the location of a well as it is being drilled.

"First you need to know where you are," Mr. Kaniappan said. "Then you need to know from where you are, where you need to go."

The need for accurate location information — in a subterranean environment that Global Positioning System satellite signals cannot reach — is true now more than ever, as oil and gas wells go deeper and become more complex, veering off horizontally through narrow hydrocarbon reservoirs or parallel existing wells.

But it is especially true right now in the Gulf of Mexico, where BP is drilling a relief well to intersect the runaway well that has been spewing oil since April.

The relief well will be used to pump heavy drilling mud, followed by cement, into the damaged well to stop the gusher permanently. But first it, or a second relief well being drilled nearby as a backup, must hit the target — the existing well's steel casing pipe, only seven inches in diameter, more than 3 miles below the surface of the gulf.

The first relief well is currently about 20 feet horizontally and less than 1,000 feet vertically from the

interception point. “We feel very good about the progress we’ve made,” Kent Wells, a BP vice president overseeing the relief well effort, said at a recent news conference, but did not revise an estimated completion date of early August.

Baker Hughes and other companies are helping BP reach the target, providing specialized techniques and tools for measuring and surveying the relief wells as they are drilled, and steering them in the right direction.

Many of these services — variously described as “measuring while drilling,” “logging while drilling” and “directional drilling” — are used in almost all wells, and have been for decades. But the techniques have been improved and expanded over the years, aided by advances in sensors and processing.

Baker Hughes and companies like Halliburton, Schlumberger and Vector Magnetics use sophisticated accelerometers and magnetometers to determine the inclination, or angle, and azimuth, or compass direction, of the hole, sending the data back to the drill rig as binary pulses in the drilling mud that circulates through the drill pipe. If the drill bit has strayed, it can be steered back on course by several means, one of which uses pressure pads against the well bore to change the bit’s direction.

With the relief wells, magnetometers are also being used to locate the target, by detecting the electromagnetic field created by an electric current induced in the runaway well’s casing pipe. The relief wells are then being steered closer and closer to the intercept point, nearly 18,000 feet down.

More than direction and location, though, sensing tools — hollow pipes that resemble thin, shiny torpedoes, up to 30 feet long, with sensors and processors installed in precisely machined cavities — can help oil companies better understand rock and hydrocarbon reservoirs, often in real time as they are drilling through them.

“During the last five to 10 years there has been a step change in the technology,” said Mattiass Schlecht, Baker Hughes’s vice president for drilling systems. Tools measure the natural gamma radiation emitted by rock, the electrical resistance of any fluids within, and even, through a kind of inverse M.R.I. device, the magnetic resonance of the nuclei of hydrocarbon atoms.

Gamma measurements can determine whether the bit is drilling through sand (which is more likely to contain hydrocarbons) or shale. Resistance information shows whether the formation contains oil, gas or water. And nuclear resonance data indicates how easily the oil will flow out of the porous rock. “How much of that fluid you can really move out of the pores and into the well bore,” Dr. Schlecht said.

Stephen Prensky, a consultant in Silver Spring, Md., who follows trends in drilling technology, said that many of the changes have been evolutionary, improvements to existing measurements using newer electronics. But the move toward more real-time data collection is crucial, he said, with deepwater and other complex wells costing upward of $100 million.

“You want to have as much information as possible to make sure you drill the best well possible,” Mr. Prensky said. “Real-time information is essential in those circumstances.”

But even in relatively simple vertical wells, measurement and other data is crucial. Geologists may have mapped the various rock formations in advance based on seismic surveys, but formations are far from homogeneous, so it can be important to know precisely what kind of rock the well has traveled through. And a well cannot be allowed to veer across a lease line, for example.

Drill bits stray all the time, as the bit encounters pockets of softer or harder rock. “Drilling straight down doesn’t necessarily mean you go straight down,” said Scott Schmidt, Baker Hughes’s president of drilling and evaluation services. “The bit wants to follow the path of least resistance.”

In any well, one goal is to keep the well bore smooth and any turns gradual, avoiding what drilling engineers call “high dogleg severity.”

"Once you have a kink in there it will hurt you for the rest of the well," Dr. Schlecht said. It will create higher friction for the drill string, he said, and make it more difficult to send casing pipe down the well.

Decades ago, well surveys were done only after pulling the drill pipe out of the hole, a process that, depending on depth, could take a day or more. Instruments were lowered on a wire, readings were taken, and the instruments were brought back up. (Some of the earliest equipment, called single-shot tools, actually took a photograph of a compass rose lowered deep in the hole; drillers would have to wait for the film to be developed to determine azimuth.)

Now the high-tech tools usually form a permanent part of the drill string, assembled at the very end. Together with the drill bit, perhaps a mud-driven motor to rotate it and steering equipment, the tools form a "bottom hole assembly" that can be well over 100 feet long — and easily worth several million dollars, particularly since the bit is usually encrusted with synthetic diamonds.

Because the tools form part of the drill string, they must be hollow to allow the drilling mud to pass through to the bit, where it provides lubrication and cooling and carries the rock cuttings back to the rig. That makes the job of the tool designer more difficult, as all the sensors, silicon chips and power supplies have to sit in the walls of the pipe. At a long and low building near Houston's international airport where Baker Hughes makes its tools, workers regularly perform extreme feats of machining, like drilling a small hole for wires down through 30 feet of pipe wall.

Not all the tools can provide data while the well is being drilled, however. Accelerometers, tiny silicon devices that measure gravitational pull along three axes, work best when there is not much external vibration, so drilling is usually stopped to take measurements, although the drill pipe remains in place.

Magnetometers work best when there is no magnetic interference from other steel, so in the early stages of drilling BP's relief wells, "ranging" runs to determine how close the relief wells were to the runaway well were performed with the drill pipe pulled out of the hole and a separate magnetometer lowered on a wire. A device sent a current into the formation, inducing a current in the metal casing pipe of the runaway well. The magnetometer detected the field created by the induced current, and software sorted out the signal to determine the distance to the pipe.

In later ranging runs, however, the drillers have been using a faster system that does not require the drill string to be pulled completely out of the well. The system also has a sensor directly behind the bit, which gives drillers a more accurate reading of the most important piece of information: where the actual bit is in relation to the runaway well.

Those magnetometers are connected to the surface by a wire that can handle a lot of data. For other tools that form part of the drill string, however, data is usually sent to the rig through mud pulse. A simple valve raises and lowers the pressure in the mud inside the drill string, and a sensor on the rig measures the small pressure changes.

With the data being transmitted at about 10 bits per second, it takes about 30 seconds to transmit basic measurement data, and that is with much of the data being crunched in processors on the tool.

That is glacially slow by modern standards, but as Mr. Kaniappan describes it, still a remarkable feat to distinguish the small pressure changes that make up the signal from all the background noise. "It's amazing the technology we have," he said.

http://www.nytimes.com/2010/07/06/science/06drill.html?ref=science

•Nut? What Nut? The Squirrel Outwits to Survive

●By NATALIE ANGIER

I was walking through the neighborhood one afternoon when, on turning a corner, I nearly tripped over a gray squirrel that was sitting in the middle of the sidewalk, eating a nut. Startled by my sudden appearance, the squirrel dashed out to the road — right in front of an oncoming car.

Before I had time to scream, the squirrel had gotten caught in the car's front hubcap, had spun around once like a cartoon character in a clothes dryer, and was spat back off. When the car drove away, the squirrel picked itself up, wobbled for a moment or two, and then resolutely hopped across the street.

You don't get to be one of the most widely disseminated mammals in the world — equally at home in the woods, a suburban backyard or any city "green space" bigger than a mousepad — if you're crushed by every Acme anvil that happens to drop your way.

"When people call me squirrely," said John L. Koprowski, a squirrel expert and professor of wildlife conservation and management at the University of Arizona, "I am flattered by the term."

The Eastern gray tree squirrel, or Sciurus carolinensis, has been so spectacularly successful that it is often considered a pest. The International Union for Conservation of Nature includes the squirrel on its list of the top 100 invasive species. The British and Italians hate gray squirrels for outcompeting their beloved native red squirrels. Manhattanites hate gray squirrels for reminding them of pigeons, and that goes for the black, brown and latte squirrel morphs, too.

Yet researchers who study gray squirrels argue that their subject is far more compelling than most people realize, and that behind the squirrel's success lies a phenomenal elasticity of body, brain and behavior. Squirrels can leap a span 10 times the length of their body, roughly double what the best human long jumper can manage. They can rotate their ankles 180 degrees, and so keep a grip while climbing no matter which way they're facing. Squirrels can learn by watching others — cross-phyletically, if need be. In their book "Squirrels: The Animal Answer Guide," Richard W. Thorington Jr. and Katie Ferrell of the Smithsonian Institution described the safe-pedestrian approach of a gray squirrel eager to traverse a busy avenue near the White House. The squirrel waited on the grass near a crosswalk until people began to cross the street, said the authors, "and then it crossed the street behind them."

In the acuity of their visual system, the sensitivity and deftness with which they can manipulate objects, their sociability, chattiness and willingness to deceive, squirrels turn out to be surprisingly similar to primates. They nest communally as multigenerational, matrilineal clans, and at the end of a hard day's forage, they greet each other with a mutual nuzzling of cheek and lip glands that looks decidedly like a kiss. Dr. Koprowski said that when he was growing up in Cleveland, squirrels were the only wild mammals to which he was exposed. "When I got to college, I thought I'd study polar bears or mountain lions," he said. "Luckily I ended up doing my master's and Ph.D. on squirrels instead."

The Eastern gray is one of about 278 squirrelly species alive today, a lineage that split off from other rodents about 40 million years ago and that includes chipmunks, marmots, woodchucks — a k a groundhogs — and prairie dogs. Squirrels are found on all continents save Antarctica and Australia, and in some of the harshest

settings: the Himalayan marmot, found at up to 18,000 feet above sea level, is among the highest-living mammals of the world.

A good part of a squirrel's strength can be traced to its elaborately veined tail, which, among other things, serves as a thermoregulatory device, in winter helping to shunt warm blood toward the squirrel's core and in summer to wick excess heat off into the air. Rodents like rats and mice are nocturnal and have poor vision, relying on whiskers to navigate their world. The gray squirrel is diurnal and has the keen eyesight to match. "Its primary visual cortex is huge," said Jon H. Kaas, a comparative neuroscientist at Vanderbilt University, A squirrel's peripheral vision is as sharp as its focal eyesight, which means it can see what's above and beside it without moving its head. While its color vision may only be so-so, akin to a person with red-green colorblindness who can tell green and red from other colors but not from each other, a squirrel has the benefit of natural sunglasses, pale yellow lenses that cut down on glare.

Gray squirrels use their sharp, shaded vision to keep an eye on each other. Michael A. Steele of Wilkes University in Pennsylvania and his colleagues have studied the squirrels' hoarding behavior, which turns out to be remarkably calculated and rococo. Squirrels may be opportunistic feeders, able to make a meal of a discarded cheeseburger, crickets or a baby sparrow if need be, but in the main they are granivores and seed hoarders. They'll gather acorns and other nuts, assess which are in danger of germinating and using up stored nutrients, remove the offending tree embryos with a few quick slices of their incisors, and then cache the sterilized treasure for later consumption, one seed per inch-deep hole.

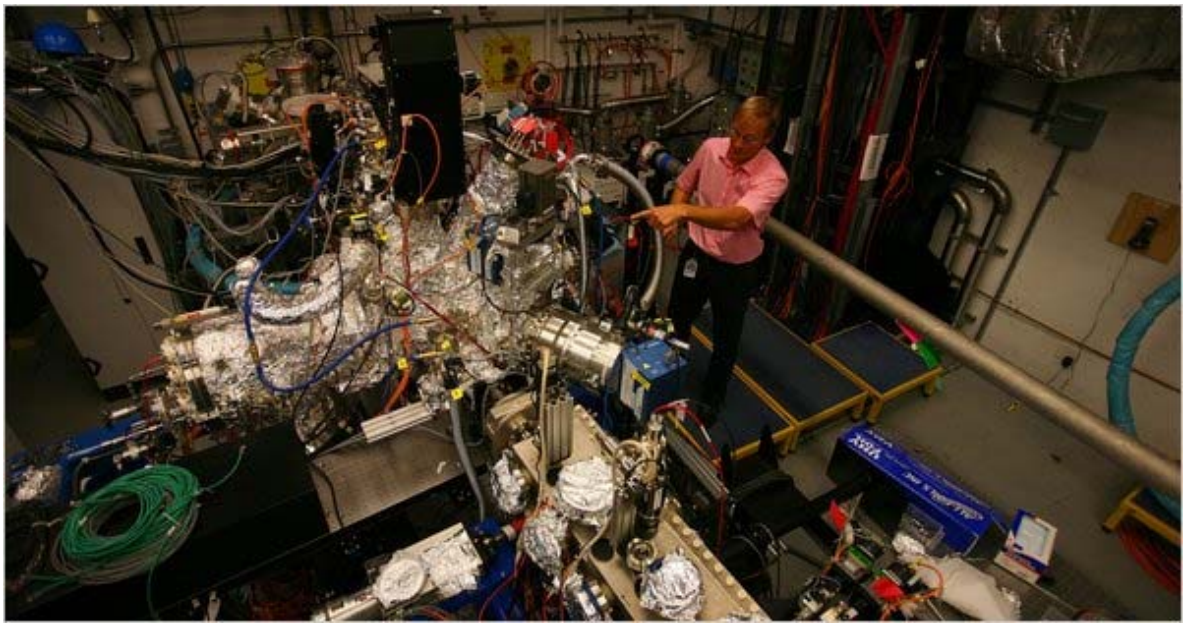
But the squirrels don't just bury an acorn and come back in winter. They bury the seed, dig it up shortly afterward, rebury it elsewhere, dig it up again. "We've seen seeds that were recached as many as five times," said Dr. Steele. The squirrels recache to deter theft, lest another squirrel spied the burial the first X times. Reporting in the journal Animal Behaviour, the Steele team showed that when squirrels are certain that they are being watched, they will actively seek to deceive the would-be thieves. They'll dig a hole, pretend to push an acorn in, and then cover it over, all the while keeping the prized seed hidden in their mouth. "Deceptive caching involves some pretty serious decision making," Dr. Steele said. "It meets the criteria of tactical deception, which previously was thought to only occur in primates."

Squirrels are also master kvetchers, modulating their utterances to convey the nature and severity of their complaint: a moaning "kuk" for mild discomfort, a buzzing sound for more pressing distress, and a short scream for extreme dismay. During the one or two days a year that a female is fertile, she will be chased by every male in the vicinity, all of them hounding her round and round a tree with sneezelike calls, and her on top, refusing to say gesundheit. A squirrel threatened by a serious predator like a cat, dog, hawk or wayward toddler will issue a multimodal alarm, barking out a series of loud chuk-chuk-chuks with a nasally, penetrating "whaa" at the end, while simultaneously performing a tail flag — lifting its fluffy baton high over its head and flicking it back and forth rhythmically.

Sarah R. Partan of Hampshire College in Amherst, Mass., and her students have used a custom-built squirrel robot to track how real squirrels respond to the components of an alarm signal. The robot looks and sounds like a squirrel, its tail moves sort of like a squirrel's, but because its plastic body is covered in rabbit fur it doesn't smell like a squirrel. Yet squirrels tested in Florida and New England have responded to the knockoff appropriately, with alarm barks of their own or by running up a tree. Human passers-by have likewise been enchanted. "People are always coming over, asking what we're doing," said Dr. Partan. "We've had to abandon many trials halfway through." An iSquirrel? Now that's something even a New Yorker might love.

http://www.nytimes.com/2010/07/06/science/06angi.html?ref=science

•X-Ray Laser Resurrects a Laboratory No Longer in the Vanguard



●By KENNETH CHANG

In the first experiments conducted at the SLAC National Accelerator Laboratory in Menlo Park, Calif., since its outdated particle accelerator was converted into the world's brightest X-ray laser, scientists managed to create what they called hollow atoms, giving just a preview of the kind of science expected to be done there. At high X-ray energies, the two innermost electrons, rather than the less tightly bound outer electrons, were knocked out first, as if peeling an onion from the inside out.

After the inner electrons are removed, the remaining electrons then successively drop into the empty spaces only to be bumped out, too, as X-ray photons slam into them. The findings appear in the current issue of the journal Nature. Another team led by scientists at Western Michigan University reported similar results last month in Physical Review Letters in the bombarding of nitrogen molecules.

While hollow neon atoms are a neat atomic trick, the ultimate goal envisioned for the SLAC laser is far more ambitious — to take pictures of individual molecules like proteins in a few millionths of a billionth of a second before the molecules are blown to smithereens.

"We are going into the arena of biology and trying to take snapshots of the worker molecules in people's bodies," said Joachim Stöhr, the director of the laser center.

"It's a billion times more intense than any other X-ray source available before," said Linda Young, director of X-ray science division at Argonne National Laboratory in Illinois, who led the neon experiment. "You need to understand how this ultra intense X-ray source will interact with matter. If you do it with something simple, you can see every step of the process."

For SLAC — known until 2008 as the Stanford Linear Accelerator Center — the X-ray laser is a renaissance and a transformation.

Four decades ago, the laboratory was arguably the preeminent particle physics laboratory in the world. In a straight tube two miles long, SLAC's linear accelerator sped electrons to near the speed of light and slammed them together, generating insights into the smallest bits of matter.

In 1974, particles created at the accelerator confirmed the existence of the charm quark, an achievement that earned the team's leader, Burton Richter, a Nobel Prize in Physics two years later. (Dr. Richter shared the honor with Samuel Ting of Brookhaven National Laboratory, which independently discovered the charm-containing particles at the same time.)

But higher energy accelerators were built elsewhere, and particle physics preeminence passed on, first to the Fermi National Accelerator Laboratory outside Chicago and now to CERN in Switzerland.

"We still are very strong in particle physics," said Persis S. Drell, SLAC's director, "but not like we were. We aren't the center of the universe any more."

SLAC's linear accelerator — linac, for short — continued to operate, studying important, but more esoteric physics questions. The management of the laboratory came under scrutiny in the 2000s by the Department of Energy, which operates the national laboratories, for accidents and sloppiness in its business operations.

Just before Christmas in 2007, a budget showdown between Congress and President Bush led to unexpected, deep cuts in the science budgets, and SLAC bore much of the brunt. Dr. Drell, who became director in late 2007, had to preside over layoffs as the staff was cut 15 percent. SLAC's last on-site particle physics experiment shut down half a year early, in April 2008.

The construction of the X-ray laser — formally known as the Linac Coherent Light Source, or L.C.L.S. for short — was already under way. The budget convulsion did not force the shift from particle physics to photon science, but it made the break more jarring.

SLAC still employs a department of particle physicists, but they now work more in the realm of astrophysics, including operating the main instrument on NASA's Fermi Gamma-Ray Telescope currently in orbit, or on instruments at accelerators elsewhere.

The linear accelerator — the same one that discovered the charm quarks, now more than 40 years old — still accelerates electrons, but now as part of the X-ray laser. Instead of the electrons being directed onto a collision course at near-light speeds, they slalom through sinuous magnetic fields. As the electrons wiggle, they emit X-rays, and with precise wiggling, the X-rays coalesce into a laser beam.

At the end of the magnetic slalom, a large magnet siphons off the electrons while the X-ray photons continue onward to the experiments. The sheer number of them clumped into ultrashort pulses enables new types of science.

No one had ever built anything like L.C.L.S. before, so glitches were to be expected when the machine was switched on the first time a year ago, typical for any large physics apparatus. On the first day that the instrument was turned on, however, electrons generated X-rays, and the X-rays coalesced into a laser beam.

The center opened for scientific research in October.

The new laser has changed not only the kind of science being done at SLAC, but who is doing it. In the past, it was primarily SLAC scientists who led the research on the flagship SLAC machines. Now, the X-ray laser is open to scientists everywhere who compete for the available time.

Thus, it was Dr. Young from Argonne who performed the first experiments, hollowing out neon as a step to understanding more complex molecules.

"It is a long way to go from neon to proteins," Dr. Young said. "The fact that you actually explain everything we see with a fairly straightforward theoretical model gives you hope."

The hope is that what will happen is that the X-rays will hollow out all of the atoms in the molecule, and then, in the brief instant before electrons cascade down to the empty spaces, scientists will be able to deduce the positions of the atoms from the scattering pattern of the X-rays. Currently, scientists deduce the shape of proteins by bouncing X-rays off protein crystals, but many proteins are too floppy to crystallize.

Dr. Young said a follow-up experiment at SLAC would to try to nudge the inner electrons of neon from one electronic position to another by precisely adjusting the energy of the X-ray photons. “It’s the ultimate control freak’s experiment,” she said.

The X-ray laser is now in its second run of experiments. The laser pulses have gotten shorter. Dr. Young had been told to expect pulses 300 femtoseconds, or 300 millionths of a billionth of a second, but on the first day, that could be shortened to 80 femtoseconds.

The laser can now produce pulses possibly as short as four femtoseconds. “We actually don’t have a good way to measure them yet,” Dr. Stöhr said. Dr. Drell said, “It went a whole lot better than I thought it was going to.”

A second instrument started running last week to study the properties of different materials. For example, data on computer hard disk is stored by flipping the magnetic orientation of ferromagnetic mixtures of cobalt, iron and nickel. With the X-ray laser pulses, scientists will be able to study how densely and how quickly bits of data can be reliably written and read.

“What are the speed limits?” Dr. Stöhr said. “How quickly can you switch a one to a zero? And when does the process go haywire?”

For now, SLAC’s X-ray laser is unique in the world, although Germany and Japan are planning similar facilities that are to turn on in a few years.

Not everyone is happy about the new SLAC, but even some of the old-timers see the change as necessary. “I think the future is grand,” said Dr. Richter. “The future is not the same as the past, but the future is never the same as the past.”

http://www.nytimes.com/2010/07/06/science/06atom.html?ref=science

•A Soft Spot for Circuitry

●By AMY HARMON

Nothing Eileen Oldaker tried could calm her mother when she called from the nursing home, disoriented and distressed in what was likely the early stages of dementia. So Ms. Oldaker hung up, dialed the nurses' station and begged them to get Paro.

Paro is a robot modeled after a baby harp seal. It trills and paddles when petted, blinks when the lights go up, opens its eyes at loud noises and yelps when handled roughly or held upside down. Two microprocessors under its artificial white fur adjust its behavior based on information from dozens of hidden sensors that monitor sound, light, temperature and touch. It perks up at the sound of its name, praise and, over time, the words it hears frequently.

"Oh, there's my baby," Ms. Oldaker's mother, Millie Lesek, exclaimed that night last winter when a staff member delivered the seal to her. "Here, Paro, come to me."

"Meeaakk," it replied, blinking up at her through long lashes.

Janet Walters, the staff member at Vincentian Home in Pittsburgh who recalled the incident, said she asked Mrs. Lesek if she would watch Paro for a little while.

"I need someone to baby-sit," she told her.

"Don't rush," Mrs. Lesek instructed, stroking Paro's antiseptic coat in a motion that elicited a wriggle of apparent delight. "He can stay the night with me."

After years of effort to coax empathy from circuitry, devices designed to soothe, support and keep us company are venturing out of the laboratory. Paro, its name derived from the first sounds of the words "personal robot," is one of a handful that take forms that are often odd, still primitive and yet, for at least some early users, strangely compelling.

For recovering addicts, doctors at the University of Massachusetts are testing a wearable sensor designed to discern drug cravings and send text messages with just the right blend of tough love.

For those with a hankering for a custom-built companion and $125,000 to spend, a talking robotic head can be modeled on the personality of your choice. It will smile at its own jokes and recognize familiar faces.

For dieters, a 15-inch robot with a touch-screen belly, big eyes and a female voice sits on the kitchen counter and offers encouragement after calculating their calories and exercise.

“Would you come back tomorrow to talk?” the robot coach asks hopefully at the end of each session. “It’s good if we can discuss your progress every day.”

Robots guided by some form of artificial intelligence now explore outer space, drop bombs, perform surgery and play soccer. Computers running artificial intelligence software handle customer service calls and beat humans at chess and, maybe, “Jeopardy!”

Machines as Companions

But building a machine that fills the basic human need for companionship has proved more difficult. Even at its edgiest, artificial intelligence cannot hold up its side of a wide-ranging conversation or, say, tell by an expression when someone is about to cry. Still, the new devices take advantage of the innate soft spot many people have for objects that seem to care — or need someone to care for them.

Their appearances in nursing homes, schools and the occasional living room are adding fuel to science fiction fantasies of machines that people can relate to as well as rely on. And they are adding a personal dimension to a debate over what human responsibilities machines should, and should not, be allowed to undertake.

Ms. Oldaker, a part-time administrative assistant, said she was glad Paro could keep her mother company when she could not. In the months before Mrs. Lesek died in March, the robot became a fixture in the room even during her daughter’s own frequent visits.

“He likes to lie on my left arm here,” Mrs. Lesek would tell her daughter. “He’s learned some new words,” she would report.

Ms. Oldaker readily took up the game, if that is what it was.

“Here, Mom, I’ll take him,” she would say, boosting Paro onto her own lap when her mother’s food tray arrived.

Even when their ministrations extended beyond the robot’s two-hour charge, Mrs. Lesek managed to derive a kind of maternal satisfaction from the seal’s sudden stillness.

“I’m the only one who can put him to sleep,” Mrs. Lesek would tell her daughter when the battery ran out.

“He was very therapeutic for her, and for me too,” Ms. Oldaker said. “It was nice just to see her enjoying something.”

Like pet therapy without the pet, Paro may hold benefits for patients who are allergic, and even those who are not. It need not be fed or cleaned up after, it does not bite, and it may, in some cases, offer an alternative to medication, a standard recourse for patients who are depressed or hard to control.

In Japan, about 1,000 Paros have been sold to nursing homes, hospitals and individual consumers. In Denmark, government health officials are trying to quantify its effect on blood pressure and other stress indicators. Since the robot went on sale in the United States late last year, a few elder care facilities have bought one; several dozen others, hedging their bets, have signed rental agreements with the Japanese manufacturer.

But some social critics see the use of robots with such patients as a sign of the low status of the elderly, especially those with dementia. As the technology improves, argues Sherry Turkle, a psychologist and professor at the Massachusetts Institute of Technology, it will only grow more tempting to substitute Paro and its ilk for a family member, friend — or actual pet — in an ever-widening number of situations.

“Paro is the beginning,” she said. “It’s allowing us to say, ‘A robot makes sense in this situation.’ But does it really? And then what? What about a robot that reads to your kid? A robot you tell your troubles to? Who among us will eventually be deserving enough to deserve people?”

But if there is an argument to be made that people should aspire to more for their loved ones than an emotional rapport with machines, some suggest that such relationships may not be so unfamiliar. Who among us, after all, has not feigned interest in another? Or abruptly switched off their affections, for that matter?

In any case, the question, some artificial intelligence aficionados say, is not whether to avoid the feelings that friendly machines evoke in us, but to figure out how to process them.

“We as a species have to learn how to deal with this new range of synthetic emotions that we’re experiencing — synthetic in the sense that they’re emanating from a manufactured object,” said Timothy Hornyak, author of “Loving the Machine,” a book about robots in Japan, where the world’s most rapidly aging population is showing a growing acceptance of robotic care. “Our technology,” he argues, “is getting ahead of our psychology.”

More proficient at emotional bonding and less toylike than their precursors — say, Aibo the metallic dog or the talking Furby of Christmas crazes past — these devices are still unlikely to replace anyone’s best friend. But as the cost of making them falls, they may be vying for a silicon-based place in our affections.

Strangely Compelling

Marleen Dean, the activities manager at Vincentian Home, where Mrs. Lesek was a resident, was not easily won over. When the home bought six Paro seals with a grant from a local government this year, “I thought, ‘What are they doing, paying $6,000 for a toy that I could get at a thrift store for $2?’ ” she said.

So she did her own test, giving residents who had responded to Paro a teddy bear with the same white fur and eyes that also opened and closed. “No reaction at all,” she reported.

Vincentian now includes “Paro visits” in its daily roster of rehabilitative services, including aromatherapy and visits from real pets. Agitated residents are often calmed by Paro; perpetually unresponsive patients light up when it is placed in their hands.

“It’s something about how it shimmies and opens its eyes when they talk to it,” Ms. Dean said, still somewhat mystified. “It seems like it’s responding to them.”

Even when it is not. Part of the seal’s appeal, according to Dr. Takanori Shibata, the computer scientist who invented Paro with financing from the Japanese government, stems from a kind of robotic sleight of hand. Scientists have observed that people tend to dislike robots whose behavior does not match their preconceptions. Because the technology was not sophisticated enough to conjure any animal accurately, he chose one that was unfamiliar, but still lovable enough that people could project their imaginations onto it. “People think of Paro,” he said, “as ‘like living.’ ”

It is a process he — and others — have begun calling “robot therapy.”

At the Veterans Affairs Medical Center in Washington on a recent sunny afternoon, about a dozen residents and visitors from a neighboring retirement home gathered in the cafeteria for their weekly session. The guests brought their own slightly dingy-looking Paros, and in wheelchairs and walkers they took turns grooming, petting and crooning to the two robotic seals.

Paro's charms did not work on everyone.

"I'm not absolutely convinced," said Mary Anna Roche, 88, a former newspaper reporter. The seal's novelty, she suggested, would wear off quickly.

But she softened when she looked at her friend Clem Smith running her fingers through Paro's fur.

"What are they feeding you?" Ms. Smith, a Shakespeare lover who said she was 98, asked the seal. "You're getting fat."

A stickler for accuracy, Ms. Roche scolded her friend. "You're 101, remember? I was at your birthday!"

The seal stirred at her tone.

"Oh!" Ms. Roche exclaimed. "He's opening his eyes."

As the hour wore on, staff members observed that the robot facilitated human interaction, rather than replaced it.

"This is a nice gathering," said Philip Richardson, who had spoken only a few words since having a stroke a few months earlier.

Dorothy Marette, the clinical psychologist supervising the cafeteria klatch, said she initially presumed that those who responded to Paro did not realize it was a robot — or that they forgot it between visits.

Yet several patients whose mental faculties are entirely intact have made special visits to her office to see the robotic harp seal.

"I know that this isn't an animal," said Pierre Carter, 62, smiling down at the robot he calls Fluffy. "But it brings out natural feelings."

Then Dr. Marette acknowledged an observation she had made of her own behavior: "It's hard to walk down the hall with it cooing and making noises and not start talking to it. I had a car that I used to talk to that was a lot less responsive."

Accepting a Trusty Tool

That effect, computer science experts said, stems from what appears to be a basic human reflex to treat objects that respond to their surroundings as alive, even when we know perfectly well that they are not.

Teenagers wept over the deaths of their digital Tamagotchi pets in the late 1990s; some owners of Roomba robotic vacuum cleaners are known to dress them up and give them nicknames.

"When something responds to us, we are built for our emotions to trigger, even when we are 110 percent certain that it is not human," said Clifford Nass, a professor of computer science at Stanford University. "Which brings up the ethical question: Should you meet the needs of people with something that basically suckers them?"

An answer may lie in whether one signs on to be manipulated.

For Amna Carreiro, a program manager at the M.I.T. Media Lab who volunteered to try a prototype of Autom, the diet coach robot, the point was to lose weight. After naming her robot Maya ("Just something about the way it looked") and dutifully entering her meals and exercise on its touch screen for a few nights, "It kind of became part of the family," she said. She lost nine pounds in six weeks.

Cory Kidd, who developed Autom as a graduate student at M.I.T., said that eye contact was crucial to the robot's appeal and that he had opted for a female voice because of research showing that people see women as especially supportive and helpful. If a user enters an enthusiastic "Definitely!" to the question "Will you tell

me what you've eaten today?" Autom gets right down to business. A reluctant "If you insist" elicits a more coaxing tone. It was the blend of the machine's dispassion with its personal attention that Ms. Carreiro found particularly helpful.

"It would say, 'You did not fulfill your goal today; how about 15 minutes of extra walking tomorrow?' " she recalled. "It was always ready with a Plan B."

Aetna, the insurance company, said it hoped to set up a trial to see whether people using it stayed on their diets longer than those who used other programs when the robot goes on sale next year.

Of course, Autom's users can choose to lie. That may be less feasible with an emotion detector under development with a million-dollar grant from the National Institute on Drug Abuse that is aimed at substance abusers who want to stay clean.

Dr. Edward Boyer of the University of Massachusetts Medical School plans to test the system, which he calls a "portable conscience," on Iraq veterans later this year. The volunteers will enter information, like places or people or events that set off cravings, and select a range of messages that they think will be most effective in a moment of temptation.

Then they don wristbands with sensors that detect physiological information correlated with their craving. With a spike in pulse not related to exertion, for instance, a wireless signal would alert the person's cellphone, which in turn would flash a message like "What are you doing now? Is this a good time to talk?" It might grow more insistent if there was no reply. (Hallmark has been solicited for help in generating evocative messages.)

With GPS units and the right algorithms, such a system could tactfully suggest other routes when recovering addicts approached places that hold particular temptation — like a corner where they used to buy drugs. It could show pictures of their children or play a motivational song.

"It works when you begin to see it as a trustworthy companion," Dr. Boyer said. "It's designed to be there for you."

http://www.nytimes.com/2010/07/05/science/05robot.html?ref=science

•Exercise: Activity and Mental Health in Women

●By RONI CARYN RABIN

People who are physically active appear to be at lower risk for cognitive impairment late in life, and for women, a new study suggests, physical activity during the teenage years may provide the greatest benefit.

The study used data about 9,395 women 65 and older, most of them white, who participated in a multicenter study of osteoporotic fractures. They were asked whether they had been physically active on a regular basis during their teenage years and at ages 30, 50 and later. Their cognitive function was also assessed.

Those who had been active regularly at any age were at lower risk for impairment in later life, but the greatest benefit was for those who had been active in their teens. Only 8.5 percent of those active during adolescence were cognitively impaired later on, compared with 16.7 percent of those who had been inactive teenagers. After adjusting for differences between the groups and risk factors like diabetes, researchers concluded that physical activity during the teenage years was associated with a 35 percent lower risk for cognitive impairment later in life.

The study was published in the Journal of the American Geriatrics Society.

“People often separate the body and mind, and forget that physical activity is actually controlled by the brain,” said Laura E. Middleton, the study’s lead author and a postdoctoral fellow at the Heart and Stroke Foundation Center for Stroke Recovery at Sunnybrook Health Sciences Center in Toronto. “A large portion of the brain is dedicated toward coordinating and controlling movement.”

http://www.nytimes.com/2010/07/06/health/research/06regimens.html?nl=health&emc=healthupdateema6

•The Body, Whole or in Parts

●By ROBERTA SMITH

The young Polish painter Jakub Julian Ziolkowski is the subject of quite a bit of buzz and clamor among collectors. Born in Zamosc, Poland, in 1980, he had his first three solo shows in his homeland in 2004, starting at the Academy of Fine Arts in Krakow, where he studied. In 2005 he had his first solo outside Poland, at Galerie Martin Janda in Vienna. In 2006 his second non-Polish solo took place at the London gallery of the contemporary art juggernaut Hauser & Wirth, on view during the Frieze Art Fair. I remember seeing that show and finding it riveting but retro, like some unexpected Eastern European offshoot of the Italian Transavantgarde of Sandro Chia and Enzo Cucchi.

After making a splash last year in "The Generational: Younger Than Jesus" at the New Museum in Manhattan — where his jewel-toned fantasies stood out amid the prevailing videos, installations and sculptures — Mr. Ziolkowski is now having his American solo debut with Hauser & Wirth New York. You could say he works fast. All 28 of the paintings and gouaches in this show — titled "Timothy Galoty & the Dead Brains," in tribute to an imaginary rock band — date from this year.

The band is conjured in several colorful, vaguely Neo-Expressionist paintings that resemble concert posters; one features a figure with two faces and a split skull from which his brain is emerging like a jack-in-the-box. The brain wears the same striped shirt and eyeball-patterned bow tie as the larger figure. (Brains and eyeballs recur in other works here, as do self-portraits of the bespectacled artist, who in this piece waves from behind a candle in the lower right corner.)

Mr. Ziolkowski seems to work largely alone in an area of his own devising, excavating material from layers of painting's recent and distant past and binding them into units that are variously horrific, beautiful, pertinent and sexually charged.

He might be called a just-paint painter. In contrast to artists like Luc Tuymans, Michael Krebber, Josh Smith or Tomma Abts, his efforts involve no photographic sources; thick, bravura brushwork; eccentric techniques; degraded everyday materials; or Conceptual frameworks. He avoids extremes of pure abstraction or precise realism, and he seems completely uninterested in painting as an object or an installation-art element.

Mr. Ziolkowski's paintings initially look slightly old-fashioned and juvenile, as if they have just emerged from a prewar attic or a hyper-hormonal teenager's bedroom. He works in oil; his surfaces are smooth but not

shiny, painted quickly with a distinct lack of preciousness. Small, rushed strokes predominate, with occasional forays into linear improvisations that deftly balance geometry and image. Some clear sources of inspiration include Surrealism, Neue Sachlichkeit, Northern Renaissance painting, Picasso, cartooning and children's book illustration, all filtered through his obsessive, of-the-moment imagination.

His art tells many stories, starting with an account of its own making, but then moving on to war, religion, violence, sex, the psyche and human folly. It often ends up in the vicinity of the body — whole or in scattered parts, sacred or profane — in ways that creep up and shock you. One of the show's larger works is "The Clash," in which two immense male and female figures do violent battle, colliding with such force that their heads shatter and the flesh rips from their bones. The composition brings to mind the demonic bird-creature of Ernst's "Ange du Foyer" as rethought by Philip Guston and Otto Dix.

But Mr. Ziolkowski can also veer toward fluorescent, encompassing tonalities and compositional unities that feel almost classically modern once you get beyond the gore. An example is the all-over pinkish field of a largish work titled "Caligula." At least from a local point of view, this expanse of cartoonish body parts and apertures suggests that Mr. Ziolkowski might be bent on negotiating a stylistic truce between two old nemeses of New York in the late 1940s: the Surrealistic entwined bodies of Pavel Tchelitchew, the author of "Hide-and-Seek," and Jackson Pollock's entwined skeins of paint.

Another all-over work is "Untitled (Into the Hole)," in which bodies and household garbage, the artist himself and a raft on which at least a few of the seven deadly sins seem to be in progress are all oozing toward a drainlike hole. And then there's the yellow-pink landscape "Milk & Honey," a Matta-like ode to breasts.

Mr. Ziolkowski's paint style and application are under constant adjustment. "Untitled (King of Israel)" is a kind of Picassoid portrait, but also a biological and geological cross-section — with a crown of thorns — whose twisted, patterned strata form both an automatist cartography and a tortured body. In contrast, "Pilgrimage" is an old-masterish update. It shows two rockers, one gory and one hairy, leading a line of skeletons across four small canvases and through the four seasons, during which the creatures progressively gain flesh, muscle and independent brains.

There's a grossness to this work and its bodily extremes that wasn't as visible last year at the New Museum, where Mr. Ziolkowski's efforts looked, in the main, a bit more mature and varied. Maybe it is just a phase he is going through. Maybe he wants to counter the chic gallery setting with some unsettling rawness, letting us know that success is fine, but that he doesn't intend to take it easy, or be easy to take.

"Jakub Julian Ziolkowski: Timothy Galoty & the Dead Brains" runs through July 30 at Hauser & Wirth, 32 East 69th Street, Manhattan; (212) 794-4970, hauserwirth.com.

http://www.nytimes.com/2010/07/06/arts/design/06ziolkowski.html?ref=design

•America, Illustrated

●By DEBORAH SOLOMON

IN an age when Democrats and Republicans are barely on speaking terms, you might not think that decades-old paintings of freckled schoolboys and their loyal mutts could help revive the conversation about what we value as a nation. Yet Norman Rockwell's cheerful America has lately acquired a startling relevance both inside and outside the art world, in part because it symbolizes an era when connectivity did not require a USB cable.

Rockwell's paintings are easy to recognize. In the years surrounding World War II his covers for The Saturday Evening Post depicted America as a small-town utopia where people are consistently decent and possess great reserves of fellow-feeling. Doctors spend time with patients whether or not they have health insurance. Students cherish their teachers and remember their birthdays. Citizens at town hall meetings stand up and speak their mind without getting booed or shouted down by gun-toting rageaholics.

This is America before the fall, or at least before searing divisions in our government and general population shattered any semblance of national solidarity. Rockwell's scenes of the small and the local speak to us in the age of the global because they offer a fantasy of civic togetherness that today seems increasingly remote. "To me the most important part of Rockwell's work is that it illustrates compassion and caring about other people," the filmmaker George Lucas, who lives in Marin County, Calif., said recently. "You could almost say he was a Buddhist painter."

Steven Spielberg, speaking from Los Angeles, had similar praise. "Anything for Norman," he said, when asked to discuss his work. "He was always on my mind because I had a great deal of respect for how he could tell stories in a single frozen image. Entire stories."

Mr. Spielberg and Mr. Lucas may be best known for vaulting E.T. and Luke Skywalker into the reaches of outer space, but they happen to be serious collectors of Rockwell's scenes of earthlings set in a galaxy close to home. Now they have pooled their art holdings and created a likely summer hit in a medium other than film. "Telling Stories: Norman Rockwell From the Collections of George Lucas and Steven Spielberg" opened Friday at the Smithsonian American Art Museum in Washington, where it remains on view until early next year.

Asked what led him to undertake the show, Mr. Lucas said in a halting voice: "I did this really because Steven wanted to do it. It was Steven's idea. I don't normally do that kind of stuff."

Told of that comment, Mr. Spielberg said, "Well, thank you, George, it's nice to know that." It is probably relevant that the filmmakers have at times been criticized for declining to lend to major Rockwell exhibitions. As Mr. Spielberg said, "George and I felt it was time that we released the Norman Rockwell collections in a way that the public can appreciate."

Rockwell, who was born on the Upper West Side of Manhattan in 1894 and died in 1978, in Stockbridge, Mass., never met either filmmaker. But like them he viewed his work as a process of visual storytelling. He was obsessed with faces and the human figure, and it would never have occurred to him, even as he sat in his studio surrounded by the majestic Berkshires, to paint a scene of mountains. Instead, in long, often angst-ridden evenings spent at his kitchen table with a pencil and sketch pad, trying to generate ideas, he composed fictions about everyday life.

If his subjects were purely imaginary, he rendered them with an uncommon amount of descriptive reality, staging scenes in his studio and going to nearly unbelievable lengths to assemble models and props. He once borrowed, for instance, an actual train seat from the Atchison, Topeka and Santa Fe Railway System and then mailed it back when he was done with it. He refused to sketch so much as an old wool sock without having the real version in front of him, humbly claiming that he could not draw from his imagination.

His heyday was the 1940s and early ’50s, when the accumulated sorrows of the Depression and two World Wars imbued Americans with a sense of solidarity and common purpose. “There was a strong sense of loss,” Mr. Spielberg said. “Because not since World War I had America’s mothers lost so many sons. It was an open wound, and Rockwell was part of the healing process.”

As beloved as he was by the public, he suffered the slings of critical derision, especially in the ’50s. The dominant art movements of that era — Abstract Expressionism, Beat poetry and hard bop jazz — devalued craftsmanship in favor of improvisation and the raw, unmediated gesture. Against this backdrop Rockwell was accused of purveying an artificial and squeaky-clean view of America, which remains a criticism of him today.

It is true that his work, for the most part, does not acknowledge social hardships or injustice. It does not offer a sustained meditation on heartbreak or death. Yet why should it? Idealization has been a reputable tradition in art at least since the days when the Greeks put up the Parthenon, and Rockwell’s work is no more unrealistic than that of countless art-history legends, like Mondrian, whose geometric compositions exemplify an ideal of harmony and calm, or Watteau, who invented the genre of the fête galante. Rockwell perfected a style of painting that might be called the American Ideal. Instead of taking place in lush European gardens, his playful gatherings are in a diner on Main Street.

It took the piety-bashing ways of postmodernism to open the gates of Rockwell appreciation in the art world. Virginia M. Mecklenburg, the curator of the current exhibition at the Smithsonian, said recently that she traces that moment to 1997, when the art historian Karal Ann Marling published an admiring monograph on Rockwell for the Harry N. Abrams Library of American Art series. The book laid the groundwork for a full-scale Rockwell reconsideration that proceeded in short order. Critics awoke to the draftsmanly prowess of his work, museums like the Solomon R. Guggenheim confidently exhibited, it and prices for his paintings rose exponentially. The auction record for a Rockwell was set in 2006, when “Breaking Home Ties” — a symbol of empty-nest despair that shows an aging rancher and his son waiting for the train that will take the boy to college — was sold for $15.4 million.

Mr. Lucas and Mr. Spielberg trace their Rockwell love to their childhoods, when they pored over the covers of The Saturday Evening Post, a weekly magazine (and misnomer) that arrived in mailboxes on Thursdays. They started collecting his work before it was validated by the art world. According to his records Mr. Lucas bought his first Rockwell, a calendar illustration, on May 16, 1980. A year and a half later Mr. Spielberg bought his first Rockwell, a stirring painting that was commissioned in 1923 as an advertisement for Underwood typewriters. It shows a young writer hunched at his cluttered desk as Daniel Boone floats above on puffy clouds, a figure of glamorous virility who provides the boy with both a subject for his literary efforts and a painful reminder of his limitations.

“I hung the painting over my desk,” Mr. Spielberg recalled. “It was my deblocker. Whenever I hit a wall or couldn’t figure out where a story was going, I just looked up at that painting.”

Mr. Lucas, who once owned an illustration gallery in New York called Super Sniper, nowadays owns one of the pre-eminent collections of magazine illustration in this country. Asked how many Rockwells he has, Mr. Lucas said: “I have quite a few more Rockwells than Steven has. I have around 50. I think Steven is in the 30s.”

Even so, judging from the current exhibition in Washington, which brings together 57 works, Mr. Spielberg

has the stronger paintings. They include “The Connoisseur,” an oil study for “Freedom of Speech,” and “Gary Cooper as ‘The Texan,’ ” of 1930, a brilliant deconstruction of the frontier myth that shows Cooper, the quintessential cowboy, exposed as a man who wears lipstick and whose masculinity is literally a put-on.

Mr. Lucas’s loans to the exhibition are distinguished by a cache of large-scale drawings, many of them as fastidious and expressive as the paintings for which they served as studies. Asked why Mr. Spielberg wound up with more major paintings, Mr. Lucas replied bluntly, “He paid more.”

He continued: “Back when we started this in the ’80s, I wasn’t as rich as people think I was. I was spending all my money making movies.” (His company, Lucasfilm Ltd., produced the Indiana Jones movies, for which Mr. Spielberg was the director.)

“Steven worked for hire,” he continued. “When he made money, it all came to him.”

Later, when Mr. Spielberg was told about that comment, he sounded surprised to hear himself described as a cash cow. “Well, isn’t that wonderful,” he said, “that I never underwrote my own film company?”

Surely the most arresting image in the current exhibition is “The Connoisseur,” which graced the cover of The Saturday Evening Post in 1962. It takes us inside a museum, where a proper-looking gentleman who appears to be around 70 is shown from the back as he holds his fedora and contemplates a large-scale drip painting by Jackson Pollock. His gray hair, gray suit and general air of quietude offer a sharp contrast with the crackling intensity of the Pollock.

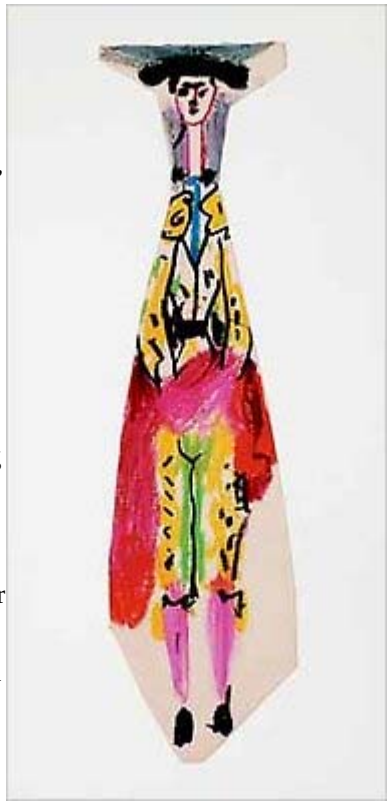
Unlike most of Rockwell’s other magazine covers, “The Connoisseur” isn’t humorous, and its meaning is elusive. The man gazing at the Pollock is a mystery man whose face remains hidden and whose thoughts are not available to us. Perhaps he is a stand-in for Rockwell, contemplating not only an abstract painting, but also his own artistic extinction. In an interview in 1962 with The Los Angeles Examiner, Rockwell expressed his respect for abstract painting when he said, “If I were young and starting out again, I would try to be an abstract artist.” At the time he made the comment he could not have imagined that his work would one day be collected by some of the same museums and individuals who also collect Abstract Expressionism. In hindsight it is possible to see Rockwell and Pollock as opposite sides of the same coin: Rockwell exemplifies the American desire for safety and security as much as Pollock exemplifies the opposing need for flight and rebellion.

The current exhibition offers us the chance to step out of the vast marble-white spaces of Washington and into a world where Americans convene in old-fashioned drugstores and barbershops, conducting themselves with a sense of integrity and fair play, with gumption and whimsy. These are qualities one wants to retain as a society, and it is a credit to Rockwell’s subtle, story-weaving imagination that he captured the values we celebrate on Independence Day without ever having done a painting of American flags waving from porches or July skies bursting with fireworks.

http://www.nytimes.com/2010/07/04/arts/design/04rockwell.html?ref=design

•Picasso Show in London Is a Family Affair

●By CAROL VOGEL



LONDON — Since it opened on June 4, nearly 1,000 people a day — a giant number for a gallery show here — have been going to the Gagosian Gallery at Britannia Street to see "Picasso: The Mediterranean Years (1945-1962)."

The exhibition was organized by John Richardson, the Picasso biographer, and Bernard Ruiz-Picasso, the artist's grandson, the same people behind a hit Picasso gallery show in New York last year. The London exhibition charts a period of the artist's life that has rarely been explored: the years when he spent most of his time in the south of France surrounded by bullfighters, poets, master craftsmen and fellow artists like Matisse. And his children.

His children played a big part in his life in the 1950s. In addition to Paulo, his son by his first wife, Olga Khokhlova, and his daughter Maya, by his mistress Marie-Thérèse Walter, Picasso fathered two more children during those years — Claude and Paloma — with Françoise Gilot, his young art-student mistress.

Their images fill many of the walls in the exhibition, but not just as subjects of paintings and drawings. There are also light-hearted watercolor silhouettes and a bronze sculpture of a girl skipping rope.

"I wanted to show Picasso at home," said Mr. Richardson, who works as a consultant to the Gagosian Gallery. And so there are many objects the artist made that offer an unusually personal look at Picasso the family man. Most have never been seen before and have been lent by his family.

Picasso made toys for his children, including cutouts of birds. And he is said to have made dolls for Paloma, although she was never allowed to play with them.

He also made colorful masks decorated in pastel and charcoal. "The masks were mostly for him and the grownups and less for the children," Mr. Richardson said. "They were so crucial to Picasso's work. He felt a change of mask could signify a change in personality, whether it be sex or age. He was always interested in metamorphosis and playing around with identities."

The show also includes a whimsically painted tie he made in 1956 that depicts a colorful toreador. "I don't know who he made that particular tie for," said Mr. Richardson, who was a friend of Picasso's and got to know his bohemian circle during the 1950s, when Mr. Richardson lived in the south of France with the scholar and collector Douglas Cooper. "He often made them for friends. He once made me a tie and a crown, but they were stolen many years ago."

Another unusual artifact in the show is a wooden door, "Anatomie Feminine," dated June 13, 1946, on which Picasso drew a woman's body in India ink, its keyhole intact. "During World War II there was an Argentinean ambassador in Paris who entertained all the artists — Matisse, Braque, Cocteau, Leger," Mr. Richardson recalled. "His had one of the few households where you could get marvelous wines and cigars and great food, despite the rationing. And he wanted the artists to make him something. So he sent this door from his house

over to Picasso to decorate. Picasso never did it at the time. Then one day, years later, he rediscovered it and painted it."

Mr. Richardson and Mr. Ruiz-Picasso were responsible for "Mosqueteros," the Picasso show held at one of Gagosian's New York spaces last year, focused on the late paintings and prints. It drew about 100,000 visitors during its run. The London exhibition, which runs through Aug. 28, will not be coming to New York, gallery officials said.

AVEDON AUCTION IN PARIS

Richard Avedon was first dispatched to Paris by Carmel Snow, the much-loved editor of Harper's Bazaar, after World War II, when the city was ailing. "He was sent there to shoot the collections," said Paul Roth, executive director of the Richard Avedon Foundation, "and to restore Paris to the eyes of the world. So he posed models and actors in famous places like Maxim's and Eiffel Tower." And throughout his life Avedon, who died in 2004, shot in Paris, a city that ended up holding a special place in his life and work.

So when the foundation decided to sell some key examples of his work, it chose Christie's in Paris to hold an auction of about 65 Avedon photographs. The sale will be held on Nov. 20 to coincide with Paris Photo, the important photography fair held every year in the Carrousel de Louvre, beneath the museum.

This will be the first time the foundation has auctioned some of its holdings; the sale is expected to bring about $6.2 million. The proceeds will go toward creating an endowment for the foundation, whose mission is to support the Avedon archives (which will be available to scholars and students) and its education programs, publications and exhibitions.

"We want people to understand the treasures that we have," Mr. Roth said. "This is the tip of the iceberg."

For sale will be a selection spanning Avedon's entire career, from the late 1940s until his death, including fashion photographs and portraiture. Among the highlights will be the largest existing print of the famous photo "Dovima With Elephants, Evening Dress by Dior, Cirque d'Hiver, Paris," which is estimated at $500,000 to $700,000. "This print hung in his Manhattan studio for years," said Joshua Holdeman, an expert in 20th-century art at Christie's.

There also will be portraits for sale, of Marilyn Monroe (estimated at $100,000 to $150,000), Brigitte Bardot ($70,000 to $90,000), Picasso ($40,000 to $60,000) and Francis Bacon ($80,000 to $120,000). Also on the block will be a set of four images of the Beatles taken in London in 1967, estimated at $300,000 to $500,000 for the group. "These are color dye-transfer prints," Mr. Holdeman said. "They are the psychedelic portraits of each of the Beatles." Another set of these prints brought a record price for the photographer at auction when it sold at Christie's in New York in 2005 for $464,000.

Because Christie's has seen a significant increase in European sales of photography and Paris, in particular, has become a center for photography collectors, this sale will kick off what will is expected to be an annual event every November for the auction house, Mr. Holdeman said.

http://www.nytimes.com/2010/07/02/arts/design/02vogel.html?ref=design

•Dyspeptic Living

●By SAM LIPSYTE

WILSON

Written and illustrated by Daniel Clowes

77 pp. Drawn & Quarterly. $21.95

Say hello to Wilson, the eponymous hero of Daniel Clowes's latest novel-in-comics. Perhaps he is a hero of our time. But if that phrase makes all you comp-lit majors think of Lermontov's Pechorin, think again: this haggard, middle-aged fellow is no dashingly depressive duelist or seducer. Wilson hectors people in coffee shops and hits on his ex-wife with sweet nothings like, "As you know, I certainly never minded a larger woman."

He is a rich mix of states and traits: lonely, alienated, obsessed with his dog and the mistakes of his past, unjustifiably smug, genuinely funny, nettlesome, underhanded, empathetic and always all too human. Does he stand for a generation, like Pechorin? No, he stands for Wilson — a glorious swirl of confusion, hypocrisy and simple yearning. Wilson may seem like an everyman, but he is soaked in idiosyncrasy, and not necessarily the kind that leads to some imagined universal. Instead we get a flawed and conflicted individual, whose laments, even when tainted by ego, or maybe *especially* when tainted by ego, are deeply affecting.

The Daniel Clowes aesthetic, delivered through his numerous comics, album covers, book illustrations and film work, has made a distinctive impression on the culture. Ever since his "Eightball" comics in the early 1990s and up through "Ghost World" and "David Boring," he has fashioned a singular style both from the drabness of America's midsize cities and towns and from the vital tradition of telling stories in panels, with pictures and words. His novels, especially, come charged with a fearless satirical wit, an emotional depth and an often enthralling creepiness — not to mention a faint mad cackle whose source is not easily traceable but whose presence provides extra texture and keeps sentimentality at bay. Though we may all have favorite Clowes creations, from the dim superhero auteur Dan Pussey to the disaffected adolescents Enid and Rebecca of "Ghost World," the Wilson of "Wilson" vies with his past triumphs and takes a bold leap beyond them.

Assembled in one-page vignettes with titles like "Haircut," "Fireside Chat" and "Mother," "Wilson" builds from clever character sketch to deadpan comedy to surprisingly forceful melodrama. We first meet Wilson walking his current home streets of Oakland, Calif., a city he admires despite his venomous spew about some famous old A's ballplayers like Sal Bando and Rollie Fingers ("his stupid mustache"). The emotional wellspring of his rants about long-retired athletes, the infantilizing nature of Hollywood films or the obfuscating jargon of modern techies, to name a few of his pet peeves, is never quite clear to him (though it's increasingly obvious to us), and this is an essential part of the fiction's logic. Still, like many reasonably smart if not completely self-aware people responding to the world with bile, Wilson is often right. Except maybe

about Rollie Fingers.

Reading “Wilson,” Clowes’s first book to be published without prior serialization, you begin to notice something, even as you laugh and wince at each brilliantly wrought expression or exchange. There is no stable Wilson. Visually, he is sometimes rendered with a familiar comic book realism, while at others he’s squashed down like some oblivious figure from the Sunday funnies. Sometimes his nose grows large, possibly when he’s lying to himself. Once, his pants switch colors with the floor in the middle of a conversation.

Verbally, he is also in flux. Part of the book’s humor derives from Wilson’s futile attempts to find a comfortable American voice for his encounters. While he narrates his life to himself in lucid contemporary modes, whenever he reaches out to strangers in coffee shops, alleyways or trains, his idiom seems wonderfully awkward, if not outdated: “Hey brother, mind if I sit here?” “How about you, friend — kids?” “Join the club, sister. My old man’s Stage 4.” The slipperiness, the mutability of Wilson — how he talks, how he looks — creates a dimensionality we can recognize. We all fumble for a common tongue. And some days we do look squashed down.

Meanwhile the narrative sneaks up on you, and when it does, a grim but hilarious momentum carries the day. Wilson is living a life rooted in less-than-Wilsonian ideals when his father dies. That their relationship was cold and distant doesn’t, of course, keep Wilson from grieving hard and questioning his path. He decides to set out in search of Pippi, the ex-wife who deserted him while pregnant. Rumors of her descent into drugs and prostitution spur Wilson’s attempt at a rescue and, perhaps, some kind of reconciliation. Also, he might have a child out there. Suffice it to say he does find Pippi, as well as their daughter, and the consequences are both heartwarming and heart-smashing, not to mention extremely deleterious to Wilson’s dog’s health and Wilson’s physical freedom. The more ludicrous turns in the plot are beautifully underplayed, and when Clowes flashes forward at the end, the chronological telescoping seems to bring with it a fleeting glimpse of real wisdom. Or something.

If Wilson is not, like Pechorin, meant to be a generational symbol, that’s because the more resonant markers of our times reside not in the epiphany of a single character but in the varying lunges at understanding achieved by the multiple Wilsons, the ways they stumble in and out of tragedy and farce. Which is to say there is something about this story that is very much a put-on, and something about it that is absolutely not. Yes, these qualities can coexist. Indeed, they require each other. It’s the put-on, the aforementioned cackle, that clears the space for fragile feeling to thrive. But before anybody raises a cudgel and intones ancient curses against “postmodern trickery” and “irony” one more boring time, it’s good to recall that artistic approaches like this have been around a while. Just ask another literary Wilson, name of Pudd’nhead.

Sam Lipsyte’s most recent novel, “The Ask,” was published in March.

http://www.nytimes.com/2010/07/04/books/review/Lipsyte-t.html?ref=design

•Urban Artisans: A Collective Thrives in Brooklyn

●By MELENA RYZIK

A proclamation from Marty Markowitz, the excitable Brooklyn borough president, is no rarity. But receiving it under the head of a quasianimatronic wolf-creature, while, around the corner, a guy upholsters a seat cushion in brown argyle, and another blends cocktails by bike — that is something special.

At a party for its fourth anniversary last month, 3rd Ward, the arts and design collective in Bushwick, received a commendation from Mr. Markowitz for its program giving free bicycles to members. But 3rd Ward hardly needed the boost: hundreds of people had come to its brightly painted labyrinthine space to celebrate. Outside were bands and burgers; inside there were demonstrations of screen-printing, woodworking, weaving, designing jewelry and welding, as well as vodka-spiked strawberry lemonade. (A bike was powering the blender.)

Since its inception, 3rd Ward has become something of a D.I.Y. utopia. When Jason Goodman, 31, and his partner, Jeremy Lovitt, 30, conceived of it, it was as a continuation of the facilities and atmosphere they had had as students at the School of the Museum of Fine Arts in Boston: a grown-up art campus. Instead 3rd Ward has evolved into an art and design incubator, where members pay a fee for access to wood and metal shops, photo studios, media labs and other spaces. It attracts hobbyists and professionals alike, as well as dabblers who sign on for a class at a time. As a one-stop network for the creative set, it has managed to be profitable even in a down economy, with annual revenues of about $1.5 million, Mr. Goodman said. It has expanded to a second location, in Williamsburg, and, as of this month, opened a restaurant, Goods, out of a converted trailer nearby.

As a model for the development of a creative business sector, 3rd Ward has attracted attention from other entrepreneurs, community leaders and cities. Six months ago Mr. Goodman and Mr. Lovitt were finally able to quit their day jobs as freelance designers and contractors to focus on 3rd Ward full time.

“We’ve changed a lot,” Mr. Goodman said. “When we opened, because we came from art backgrounds, we

were thinking, like, artist, artist, artist, but really it's like designer, designer, designer, artist. We have way more inventors, furniture makers, cabinet makers, commercial photographers, hackers, than we do what you would originally conceive of like an artist."

Their success came in identifying a market and tailoring to it. "The industry here that's really exploding right now, and it's really underserved, is this freelancing creative industry," Mr. Goodman said.

Chiun-Kai Shih, 34, creative editor for Condé Nast China, has been a 3rd Ward member for three years, commuting there several times a month from his home on the Upper West Side. He parks his assistant there full time; hired a 24-year-old woodworking teacher, Becky Carter, to build sets for a photo shoot; and, more than a studio, considers 3rd Ward a resource for young talent.

"I just went to the front desk and said, 'Do you know any great graphic designers,' and they said, 'Yes, we'll give you names,' " he recalled.

Mr. Shih holds casting sessions there too. "Even supermodels who don't like to travel for casting, I drag them out to 3rd Ward," he said — via car service, of course.

In September 2005, when Mr. Goodman and Mr. Lovitt signed a lease on a 20,000-square-foot shell of a warehouse on a desolate block in Bushwick, they had no business plan. By the time they opened their doors in May 2006, nothing had changed. While they built their clientele and space, they sustained themselves by hosting lavish rent parties in partnership with underground promoters.

The raucous till-dawn affairs, with rooftop fire spinners and marching bands in the hallways, often attracted the attention of the police. After about a year, the parties had to end. If you want professionals to come work during the week, Mr. Goodman said, "you can't trash a place every weekend."

Not that 3rd Ward has become a party-free zone: it is still home to art receptions, concerts, barbecues and the occasional blowout. (The underground promoter William Etundi is now on the payroll.)

But the focus has shifted: there's a staff of 17, along with several dozen freelance teachers, in spaces that have expanded to a total of 35,000 square feet. (The collective pays about $15 a square foot in rent.) It offers 100 classes a quarter, all lavishly described in a course catalog that more closely resembles a magazine, with interviews and features, which Mr. Goodman oversees.

There are courses in children's book illustration, digital textile design, plastic fabrication and professional development for performance artists. Demand was so great that last year 3rd Ward opened its overflow space in Williamsburg, across from where its Goods restaurant now sits.

That, too, was a lesson: Mr. Goodman and Mr. Lovitt bought a 1946 trailer from a junkyard upstate, restored it to its chrome glory and converted the interior to a kitchen. Stripping off six layers of paint and removing several hornets' nests was the easy part; dealing with the many city agencies that governed the empty lot where they wanted to put it took more than a year. (The seating is all outdoors; the New Orleans-born chef, Alex McCrery, plans to serve artisanal takeout food, and beignets, year-round.) Much of the design for Goods was contributed by Michael Byrnes, a 3rd Ward member.

3rd Ward — named for the district it was in back when Williamsburg was its own city — now has about 750 members, up 15 percent this spring, Mr. Goodman said. Their fees range from $49 a month for a basic membership with limited access, to $499 a month for all the services and perks (free shop and conference-room use, free bicycles, free Intelligentsia coffee). Last November Sara Feinberg, 29, a Brooklyn public defender, paid $3,200 upfront to become a lifetime member.

"It was an agonizing decision," she said. "It was the single largest purchase I've ever made."

But, she added, on a break from her woodworking class on Monday night, "It was worth it." So far she's also taken classes in sculpture using alginate, a seaweed derivative; wood finishing; and circuitry, "which was

amazing — we're making a robot!"

Growth during the recession came because 3rd Ward offered options: for photographers looking to scale down from studios in Manhattan, say, or small-business owners hoping to scale up in expertise or space. Businesses rent one desk, then two, then expand to their own storefronts.

After making a few tote bags at a regular monthly workshop on Monday, Pamela Moore, 48, the owner of a vintage clothing, accessories and furniture company, was registering for a course in Illustrator, a design program.

"When I was a graphic designer, it was before you were using computers," she said. "I need to bring my skills into the 21st century." Ms. Moore and her partner, Ignacio Quiles, 57, who operate their business out of their East Village apartment, joined 3rd Ward in April to take classes and use its conference rooms and wood shop.

"So far it's exceeded my expectations," she said. "If I had had this when I was starting out, I probably wouldn't still be managing a retail store."

Though there are other collective design centers in Brooklyn, Carl Hum, the president and chief executive of the Brooklyn Chamber of Commerce, praised 3rd Ward for its membership-driven business model. "True to their mission, they created a real community," he said.

For Mr. Goodman, keeping that going is creative challenge enough. "I'm not like a working artist, but this is my big sculpture," he said. "It's the complexity of this that's so intriguing for me."

And for Ms. Feinberg, the defense lawyer, the appeal is also in reaching beyond the routine. Going to 3rd Ward, she said, made her feel like "a very complete person."

"Everyone else in my office just gets drunk to deal with the stress of the job," she added, "and I do woodworking."

http://www.nytimes.com/2010/07/03/arts/design/03third.html?ref=design

•Commentary That's Both Visual and Vocal

●By KAREN ROSENBERG

Marina Abramovic's survey has come and gone, but another longtime performance artist is at large in the Museum of Modern Art. You probably won't see this one, but you'll definitely hear visitors carrying out her instructions to step up to a microphone and scream. That is Yoko Ono, who is reprising her "Voice Piece for Soprano," originally from 1961, and other pieces as part of MoMA's latest reinstallation of its contemporary galleries. Like previous exhibitions in the series, "Contemporary Art From the Collection" presents a loosely thematic take on art since the late '60s. But it's also a shock to the system, not unlike the screeches and shrieks that emanate from the atrium.

Its stated focus is "current events from the past 40 years," made literal in Robert Rauschenberg's 60-foot screenprint of press clippings from 1970, "Currents," but otherwise suspiciously broad-sounding. (What contemporary art isn't, in some way, about current events?) Really, though, it's about the different ways that art can convey urgency and immediacy. Thus the organizers — the museum's associate director, Kathy Halbreich, and the curator Christophe Cherix, serve up plenty of performance and performance leftovers. Both are making their first big statements with the contemporary collection, though since arriving at the museum in 2008, they've worked on smaller shows, like Ms. Halbreich's "9 Screens" and Mr. Cherix's {ldquo}In & Out of Amsterdam.{rdquo}

Ms. Halbreich, formerly the director of the Walker Art Center in Minneapolis, deftly weaves film and video into the mix: short, saucy pieces by Kalup Linzy and Hannah Wilke, and longer, more intense ones by Glenn Ligon and Paul Sharits. Mr. Cherix's touch can be felt in the many works from his department: prints and illustrated books. Each has made some inspired choices, in the selection and the installation. They pick uncharacteristic works by the artists we know well, and turn up major statements by the ones we don't. (And, yes, a healthy percentage of the art is by women; a set of posters by the Guerrilla Girls reminds you that this is

a relatively new development.) Among the gems the curators have unearthed is a bridge made of linked pads of steel wool, by the Arte Povera sculptor Pino Pascali; it shares a small gallery with a body-impression drawing by David Hammons, a photograph by Sigmar Polke and a puddle of white spray lacquer by Lawrence Weiner.

The curators also mine the Gilbert and Lila Silverman Fluxus Collection, a 2009 gift of some 3,000 works relating to the Fluxus movement. This explains Ms. Ono's prominence in the atrium ("Voice Piece for Soprano") and the sculpture garden ("Wish Tree," 1996/2010). And in "Whisper Piece" she's written brief invocations in tiny handwriting on walls throughout the exhibition.

Another Fluxus artist, Alison Knowles, will perform a version of a work from 1969 titled "The Identical Lunch." Beginning next January, she'll serve the same meal — a tuna fish sandwich — to one table of eight visitors to the second-floor cafe who have registered in advance. In the meantime you can see vintage photographs of her friends and colleagues eating their sandwiches.

And just below Ms. Knowles's photographs, a major installation by an underrated elder statesman of Fluxus, George Maciunas, incorporates emptied lemonade cans, sugar boxes and other containers: the remains of food and household products consumed by the artist over a period of one year.

Other bodycentric art is summarily acknowledged in a small gallery of ephemera. Here are the provocative posters and Artforum advertisements through which Robert Morris and Lynda Benglis waged gender war, as well as grainy 1972 Super 8 footage of Vito Acconci performing his autoerotic "Seedbed."

The show's most memorable performance, though, belongs to Ms. Wilke. In a video made in 1976 at the Philadelphia Museum of Art, the distractingly stylish artist struts and strips behind Duchamp's {ldquo}Large Glass.{rdquo}

At this stage of the exhibition, the dearth of painting becomes hard to ignore. It's remedied soon enough, with dueling stripes by Daniel Buren and Agnes Martin and a mesmerizing multicolored abstraction by Simon Hantai. Let the others have their Minimalism and institutional critique; the only theory in Mr. Hantai's "Untitled (Suite 'Blancs')," made by painting exposed parts of a crumpled canvas, is string theory.

Even better is the gallery devoted to the 1980s, partly covered in General Idea's {ldquo}AIDS (Wallpaper).{rdquo} Modeled on Robert Indiana's "LOVE" letters, it makes a striking background for Warhol's immense gold Rorschach painting and Bruce Nauman's drawing "Punch and Judy II Birth & Life & Sex & Death." The elements of the installation are so carefully interwoven that the show starts to look like a Biennial, in a good way.

The final section, though, has some of the not-so-good hallmarks of Biennials: uninspired found-object tweaking, meaningless clustering and text that's full of curatorspeak ("willful mistranslation"). The sweet scent of Cildo Meireles's hay-bale cube, "Thread," helps a bit, as do strong drawings and prints by Huang Yong Ping and Huma Bhabha. The intensity picks up again at the show's end, with an installation that documents Paul Chan's {ldquo}Waiting for Godot in New Orleans.{rdquo} Mr. Chan's 2007 staging of that Beckett play in the Katrina-scarred Lower Ninth Ward was, by all accounts, a profound and cathartic event.

Some of those emotions get lost in Mr. Chan's exhaustive archive of audio, video, photographs, maps and props. But they return, suddenly, with a scream. "Contemporary Art From the Collection" continues through Sept. 12, 2011, at the Museum of Modern Art; (212) 708-9400, moma.org.

http://www.nytimes.com/2010/07/02/arts/design/02contemporary.html?ref=design

•Japanese Kaguya probe saw deep Moon rock

Page last updated at 16:37 GMT, Monday, 5 July 2010

Kaguya famously made a high-definition version of the Apollo "Earthrise"

Rocks that may have originated deep within the Moon were spied on its surface by a Japanese probe.The Kaguya (Selene) mission surveyed Earth's satellite until a year ago.Scientists report in Nature Geoscience that it saw exposures of rocks rich in the mineral olivine in concentric rings around craters.

They suggest that large impacts could have penetrated the Moon's outer crust, bringing into view the mantle olivine stored just below the surface.The observations are said to fit well with ideas about how the Moon formed.

Current theory holds that Earth was hit by a Mars-sized body early in the evolution of the Solar System, and that the debris thrown into space by this impact coalesced into the Moon.The sequence of mineral crystallisation in this ball of molten rock would have seen olivine (a magnesium iron silicate) produced before more dense materials, causing it to sink deep into the interior.

But this then led to a gravitationally unstable body with those more dense materials eventually displacing the olivine. As a consequence, the Moon's mantle, it is hypothesised, underwent an "overturning", in which the olivine was transferred to just below the crust.That being the case, one might expect to see olivine in places where a thin crust has been broken - such as at impact craters - say Satoru Yamamoto, of the National Institute for Environmental Studies in Tsukuba, and colleagues.

"These craters with olivine-rich sites are very large, with diameters of several 100km to a 1,000km," Dr Yamamoto told BBC News. "In this case, the excavation depth during the formation of these craters is about 100km. Thus, we propose that olivine-rich sites found here originate from deep-seated lunar mantle (as deep as 100km), which were excavated by gigantic impacts of huge meteoroids."

In the journal, Dr Yamamoto's team reports Kaguya's observations of strong olivine signals at 34 sites, including three previously reported. The sites include the South Pole-Aitken, Imbrium and Moscoviense impact basins.Dr Yamamoto added: "I think that our new data give us an important piece of knowledge on the inside development of the Moon's mantle. Although there is a lot of information on the surface of the Moon, little is known about below the crust. "Therefore, the structure and origin of the Moon's mantle have been debated for a long time. On the other hand, our new data provide important constraints on any models that try to show how the early crust and mantle of Moon-like bodies form and evolve."The Japanese space agency (Jaxa) probe was launched in 2007. It orbited the Moon for one year and eight months, and famously returned the first high-definition movies of the lunar surface.It was intentionally crashed into the Moon on 10 June last year

http://news.bbc.co.uk/2/hi/science_and_environment/10511064.stm

•Depression may double dementia risk, say researchers

Page last updated at 01:09 GMT, Tuesday, 6 July 2010 02:09 UK

An estimated 750,000 people in the UK suffer from a form of dementia

Having depression may nearly double the risk of developing dementia later in life, new research suggests.

Experts know that the two conditions often co-exist, but it is not clear if one actually leads to the other.

Now two studies published in the American journal Neurology suggest depression does mean dementia is more likely, although they do not show why.

And the researchers stress that the findings merely reveal a link, not a direct cause.

They say more studies are needed to find out why the two conditions are linked.

They believe brain chemistry and lifestyle factors like diet and the amount of social time a person engages in may play a role.

Dr Jane Saczynski of the University of Massachusetts, who led the first of the two studies, said: "While it's unclear if depression causes dementia, there are a number of ways depression might impact the risk of dementia.

> What this study demonstrates is that depression at a younger age is probably a significant risk factor for dementia

Professor Clive Ballard The Alzheimer's Society

"Inflammation of brain tissue that occurs when a person is depressed might contribute to dementia. Certain proteins found in the brain that increase with depression may also increase the risk of developing dementia."

Her study, which followed 949 elderly people for 17 years, showed dementia more often followed a bout of

depression.

By the end of the study, 164 of the people had developed dementia.

Specifically, 22% of those who had depression went on to develop dementia compared to 17% of those who did not have depression.

The second study, meanwhile, followed 1,239 US people and looked at the number of times a person experienced depression related to their risk of dementia.

It showed that the more times someone experienced depression, the higher their dementia risk was.

Having two or more episodes of depression nearly doubled the risk of dementia.

Rebecca Wood, chief executive of the Alzheimer's Research Trust, said: "Similarities in symptoms between dementia and depression can mean the two are sometimes confused at time of diagnosis, but we don't know if they are biologically linked.

"These latest studies suggest that there may be profound connections between dementia and depression so we must expand the research to find out more."

Professor Clive Ballard of the Alzheimer's Society agreed that more research was now needed to establish why the link exists.

"It is well known depression is common in early stages of dementia. What this study demonstrates is that depression at a younger age is probably a significant risk factor for dementia," he said.

http://news.bbc.co.uk/2/hi/health/10507074.stm

•Nigeria: Preserving Our Local Languages

Gbemisola Ojo

5 July 2010

Opinión Lagos — It is no longer a new thing in Nigeria of today to see a Nigerian child who cannot speak his native language or the native language of his immediate environment. It is bad to an extent that some cannot even decipher the meaning of words in their local dialect if the language is spoken to them.

It is easy for the illiterates to groom their children well in the use of the native languages probably because it is the only language they can effectively use for the purpose of communication, although there some educated ones that know the importance of language and have effectively promoted such in the lives of their children and those they have opportunity of influencing when it comes to the promotion of the native languages.

Many are actually ignorant of the importance of the native languages and tend to ignore it and rather promote the sole use of foreign languages in the society as a means of communication. There is really nothing wrong in the speaking and acquisition of foreign languages but the problem mainly is allowing the native languages go into extinction through non usage.

Some languages used before now had already gone into extinction and Nigeria is not an exception when it comes to this notion. Already, the Igbani language which used to be one of the native languages spoken in Rivers State Nigeria is near extinction; many more languages might tow that path if something is not done urgently to serve as a measure of preserving the native languages.

Foreign languages are good and have the importance of promoting the country internationally but promotion of the foreign languages are not to be done at the expense of the native languages because customs, norms, tradition and the entire culture of the people are all woven round the native languages.

It is a common practice in some homes today to communicate in foreign languages with reckless abandon of the native language but this is ignorance on the part of the people; this makes it difficult for children in such homes to learn and speak the native language.

The truth of the matter is that if the native languages finally move into the stage of extinction, the culture and tradition of the people will also move into a stage of forgetfulness. A child that cannot speak the native language cannot for any reason value the culture and embrace the values, norms and practices in the culture.

Nigeria is known as a Country filled with communities that have rich cultural values; critical consideration of this fact will buttress the reason why none of the local languages should go into extinction because each has a culture it projects which enhances the national prestige.

The social vice in the society is a result of neglect of the cultural values. Language cannot be separated from man because it is what the people use for the purpose of meaningful existence. Language makes it possible for the people to truly understand culture and history of their community. The language of the immediate community (native language) is what can truly interpret the norm, practices and customs of the people.

The native languages link the people and are used for clarifying issues. The reality of the native language which is also common to other languages is associating words to objects which have been in place right from the inception of the community speaking the language.

Communication, an essential tool used for the purpose of human and societal development use language to function effectively. There are certain words in the native languages that will inevitably aid societal

development because of sentimental attachment users have to the cultural beliefs.

The native languages are used for averting or curbing confusion in the society. There are certain times that certain issues need clarification in the society; the native languages are used for wider coverage and for the message to make the impact it ought to make. The native languages pave way for a clearer understanding of a particular thing, place, object or idea.

Names as symbols are associated to objects, places and events as a result of languages. Language is used for the purpose of identification and distinguishing one thing from the other.

Language is the lifestyle of the people and the daily way of living involves every inclination of human existence.

Walt Whitman (1819 1892) is of the opinion that "language is not an abstract construction of the learned or of dictionary makers, but it is something arising out of work, needs, ties, joys, affections, tastes of long generation of humanity and has its bases broad and low, close to the ground"

The language of the immediate community was not coined in isolation but its origin is a result of the experiences of the people in relation to their norms and practices which makes the language of the people important. Language determines to a large extent the origin of a man or where he can be traced to in any society.

Communication is as old as man and language a tool of communicating with self and others incorporate the internal thought in conjunction with external factors which will make man extraordinary.

In as much as man will use language on his personality through the thought process for self development, it will affect how he relate and communicate with others. Who a man is through language use especially the native language will determine the influence and the impact he will have on the society in relation to his relevance in societal development or contribution to the destruction of the society.

If structured symbols are not used for sharing meanings, there would have been a lot of confusion in relating to others in the society; a person can say a particular word and other meaning other than the expected meaning can be deduced by the listeners if symbols are not used.

Edgar Lee (1865-1946) in the Ancient life of the Mexico is of the opinion that "there is no master key to the inner life of a people, but language unlocks a vast treasure house".

Language will make the social and cultural practices of a community beneficial and worthwhile via giving room to realizing their reason of existence most especially in relevance to the community.

Language is used to give necessary information to the people for them to take the right decision and exhibit the right attitude through the use of words and actions. Language will enable giving the right and reasonable idea that will develop the society and individuals with the right emotion that will positively enhance the development of the person and the society. Language cannot be separated from the culture of the people.

For a child to learn a language, he needs to interact with the people that speak the language. The issue now is, aside from the school setting, most children spend more hours with family members. In a setting where foreign language is used at home and school with no bias for native language, it will relatively be difficult for the child to learn and speak the native language.

In as much as genetic issues play a significant role in the acquisition of a language, interaction and usage of the language is what will make its acquisition possible

William Graham Sumner (1840-1910) is of the opinion that "the way to learn a language is to sit down and learn it ".Learning the native languages is a step that must be taken with great determination considering the benefits of the bold step.

Language is like a plain board allowing certain things to be written on it while disallowing others. Language gives expression to the thought process with consideration for native speaker to have a clearer picture of the idea. The thought process is controlled by language; this makes Samuel Johnson to say that "language is the dress of thought".

Countries like China, Korea, Germany etc employ the use of the native language even for the purpose of academics and this enable them to be technologically advanced because the people use their native language for learning and makes learning easier.

The native language enables the people to think through an issue and come up with tangible resolutions that led to great inventions. They acquired knowledge through a language they truly understand.

The extinction of the local languages will lead to the extinction of the cultural values Nigerians are presently promoting because the norms, practices, values and belief of a society are all dependants of language. If native languages are given opportunity to phase out, it will affect the lives of the people and gradually milk out the norms, values and the beliefs of the people.

For the languages not to die, steps should be taken to preserve the languages. Nigerian languages should not be a passive part of the Educational Curriculum but an active part of it. Students should study at least one native language before the end of the Secondary education and the native languages should be introduced early enough in school probably from the nursery classes.

Radio and Television stations schedules should have programs designed for Nigerian children with great emphasis on the promotion of the native languages.

The native languages should be used as a means of communicating at home for a child to have opportunity of maximally using the language at home for a child to have a clearer understanding of the language.

It might not be so obvious now that some of the native languages are gradually fading into extinction but a step to salvage the languages must be speedily taken and this involve great determination on the part of every one.

The languages need to live and not just exist as a figure among the total number of languages in Nigeria. Salvage the languages and the posterity of the culture and promotion of the cultural values will be certain. Definitely, a promotion of the cultural values guarantees the extinction of social vice in the society. Let the native languages live and not die.

Ojo wrote from Port Harcourt

http://allafrica.com/stories/201007050898.html

3,200-Year-Old Bronze Tablet Identified as Battle Chariot Linchpin

Archaeologists have found a 3,200-year-old round bronze tablet with a carved face of a woman, found at the El-ahwat excavation site near Katzir in central Israel, is part of a linchpin that held the wheel of a battle chariot (Credit: Image courtesy of University of Haifa)

ScienceDaily (July 6, 2010) — A 3,200-year-old round bronze tablet with a carved face of a woman, found at the El-ahwat excavation site near Katzir in central Israel, is part of a linchpin that held the wheel of a battle chariot in place. This was revealed by scientist Oren Cohen of the Zinman Institute of Archaeology at the University of Haifa.

"Such an identification reinforces the claim that a high-ranking Egyptian or local ruler was based at this location, and is likely to support the theory that the site is Harosheth Haggoyim, the home town of Sisera, as mentioned in Judges 4-5," says Prof. Zertal.

The El-ahwat site, near Nahal 'Iron, was exposed by a cooperative delegation excavating there during 1993-2000 from the Universities of Haifa and Cagliari (Sardinia), headed by Prof. Zertal. The excavated city has been dated back to the end of the Bronze Age and early Iron Age (13th-12th centuries B.C.E.). The city's uniqueness -- its fortifications, passageways in the walls, and rounded huts -- made it foreign amidst the Canaanite landscape.

Prof. Zertal has proposed that based on these unusual features, the site may have been home to the Shardana tribe of the Sea-Peoples, who, according to some researchers, lived in Harosheth Haggoyim, Sisera's capital city. The city is mentioned in the Bible's narratives as Sisera's capital, and it was from there that the army of chariots set out to fight the Israelites, who were being led by Deborah the prophetess and Barak, son of Avinoam. The full excavation and its conclusions have been summarized in Prof. Zertal's book "Sisera's Secret, A Journey following the Sea-Peoples and the Song of Deborah" (Dvir, Tel Aviv, 2010 [Hebrew]).

One of the objects uncovered at the site remained masked in mystery. The round, bronze tablet, about 2 cm. in diameter and 5 mm thick, was found in a structure identified as the "Governor's House." The object features a carved face of a woman wearing a cap and earrings shaped as chariot wheels. When uncovered in 1997, it was

already clear that the tablet was the broken end of an elongated object, but Mr. Cohen, who included the tablet in the final report of the excavations, did not manage to find its parallel in any other archaeological discoveries.

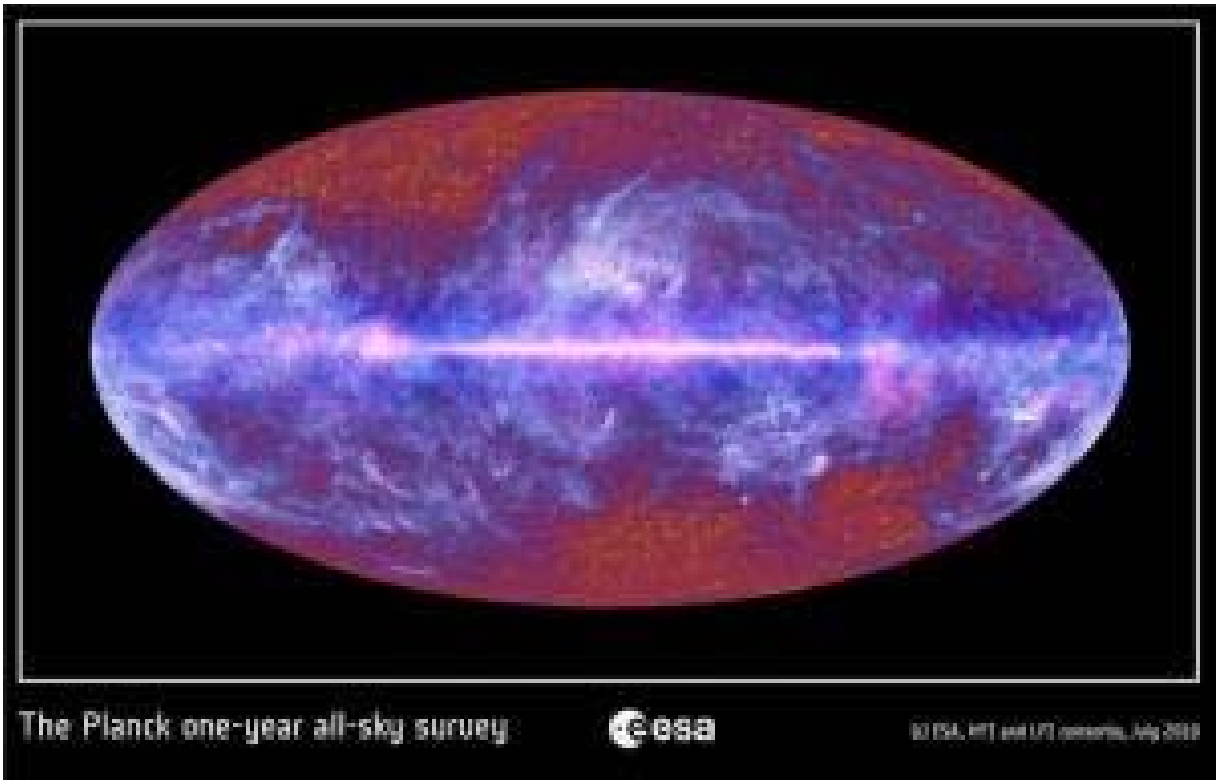
Now, 13 years later, the mystery has been solved. When carrying out a scrutinizing study of ancient Egyptian reliefs depicting chariot battles, Mr. Cohen discerned a unique decoration: the bronze linchpins fastening the chariot wheels were decorated with people's faces -- of captives, foreigners and enemies of Egypt. He also noticed that these decorations characterized those chariots that were used by royalty and distinguished people.

"This identification enhances the historical and archaeological value of the site and proves that chariots belonging to high-ranking individuals were found there. It provides support for the possibility, which has not yet been definitively established, that this was Sisera's city of residence and that it was from there that the chariots set out on their way to the battle against the Israelite tribes, located between the ancient sites of Taanach and Megiddo," Prof. Zertal concludes.

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of Haifa.

http://www.sciencedaily.com/releases/2010/07/100701103407.htm

Planck Unveils the Universe -- Now and Then



The microwave sky as seen by Planck. (Credit: ESA/LFI & HFI Consortia)

ScienceDaily (July 6, 2010) — ESA's Planck mission has delivered its first all-sky image. It not only provides new insight into the way stars and galaxies form but also tells us how the Universe itself came to life after the Big Bang.

"This is the moment that Planck was conceived for," says ESA Director of Science and Robotic Exploration, David Southwood. "We're not giving the answer. We are opening the door to an Eldorado where scientists can seek the nuggets that will lead to deeper understanding of how our Universe came to be and how it works now. The image itself and its remarkable quality is a tribute to the engineers who built and have operated Planck. Now the scientific harvest must begin."

From the closest portions of the Milky Way to the furthest reaches of space and time, the new all-sky Planck image is an extraordinary treasure chest of new data for astronomers.

The main disc of our Galaxy runs across the centre of the image. Immediately striking are the streamers of cold dust reaching above and below the Milky Way. This galactic web is where new stars are being formed, and Planck has found many locations where individual stars are edging toward birth or just beginning their cycle of development.

Less spectacular but perhaps more intriguing is the mottled backdrop at the top and bottom. This is the 'cosmic microwave background radiation' (CMBR). It is the oldest light in the Universe, the remains of the fireball out of which our Universe sprang into existence 13.7 billion years ago.

While the Milky Way shows us what the local Universe looks like now, those microwaves show us what the Universe looked like close to its time of creation, before there were stars or galaxies. Here we come to the heart of Planck's mission to decode what happened in that primordial Universe from the pattern of the mottled backdrop.

The microwave pattern is the cosmic blueprint from which today's clusters and superclusters of galaxies were built. The different colours represent minute differences in the temperature and density of matter across the sky. Somehow these small irregularities evolved into denser regions that became the galaxies of today.

The CMBR covers the entire sky but most of it is hidden in this image by the Milky Way's emission, which must be digitally removed from the final data in order to see the microwave background in its entirety.

When this work is completed, Planck will show us the most precise picture of the microwave background ever obtained. The big question will be whether the data will reveal the cosmic signature of the primordial period called inflation. This era is postulated to have taken place just after the Big Bang and resulted in the Universe expanding enormously in size over an extremely short period.

Planck continues to map the Universe. By the end of its mission in 2012, it will have completed four all-sky scans. The first full data release of the CMBR is planned for 2012. Before then, the catalogue containing individual objects in our Galaxy and whole distant galaxies will be released in January 2011.

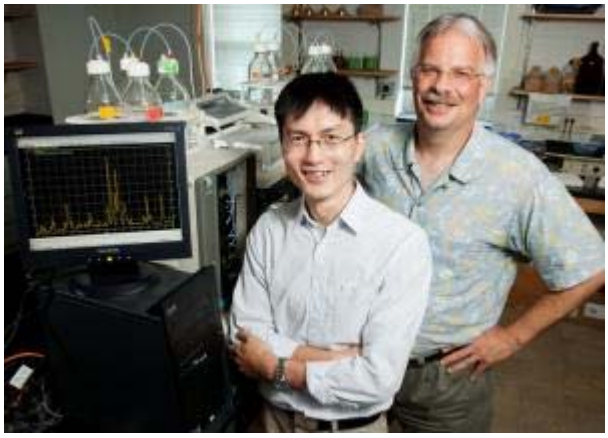
"This image is just a glimpse of what Planck will ultimately see," says Jan Tauber, ESA's Planck Project Scientist.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2010/07/100705074332.htm

Histone H1 Regulates Gene Activity Throughout the Cell Cycle



Craig Mizzen, a professor of cell and developmental biology at the University of Illinois, right; Yupeng Zheng, a doctoral student at the time of the study; and their colleagues discovered that the phosphorylated H1 histone protein has an important role in regulating gene activity. (Credit: Photo by L. Brian Stauffer)

ScienceDaily (July 6, 2010) — A protein that helps pack DNA into the cell nucleus has an important role in regulating gene activity, scientists report. The researchers found that the protein, histone H1, also takes part in the formation of ribosomes, the cellular workbenches on which all proteins are made.

The study appeared online May 3 in The Journal of Cell Biology.

A human cell's genetic material is so vast that it must be condensed into tightly wound structures resembling beads on a string. The DNA winds around four core histone proteins to form one of the "beads" while H1 or "linker" histones clamp the DNA into place where it enters and exits the beads. One bead and its associated DNA make up a nucleosome. There are well over a million nucleosomes in the nucleus of a cell.

There are many varieties of the H1 histone protein in animals, making the histones difficult to study. Most research into histone biology has focused on the core histones, and previous studies have found that various cellular modifications of these other histones coincide with changes in gene activity.

The new study found that when H1 histones are modified by the addition of a phosphate group, a process called phosphorylation, that modification is associated with changes in gene activity in the vicinity of the phosphorylated histone.

"Most studies of histone phosphorylation have focused on cell division, when phosphorylation is at its peak," said Craig Mizzen, a professor of cell and developmental biology at the University of Illinois and corresponding author on the study. During cell division "much less of the genome is transcribed than at other points in the cell cycle," Mizzen said. "Everything is geared toward separating the replicated genome copies equally between the new daughter cells."

Suspecting that H1 phosphorylation was important for processes besides cell division, Mizzen and his colleagues identified the exact sites in H1 that are phosphorylated during various portions of the cell cycle.

Then-doctoral student Yupeng Zheng developed antibodies that recognize phosphorylation at the H1 sites cells use when they are not dividing. This enabled Zheng to discover that such "interphase" H1 phosphorylation is preferentially associated with genes when they are actually being transcribed.

"Histones are normally found all over the genome," Mizzen said, " and elucidating what is different about the nucleosomes on active genes versus those on repressed genes versus the rest of the genome, most of which is not protein-coding, is a central goal of current research in molecular biology."

Several core histone modifications are known to localize preferentially to active genes, Mizzen said. "But our work provides the first evidence that this is also true for H1 that is phosphorylated at specific sites."

Zheng also made a second surprising discovery. Using fluorescence microscopy to analyze cells, he noticed that the fluorescently labeled antibodies targeting phosphorylated H1 in non-dividing cells were lighting up the nucleolus, the region of the nucleus that is dedicated to transcribing ribosomal RNA, the special RNA upon which ribosomes are assembled.

"The ribosomal RNA genes are kept in the nucleolus and they're transcribed by a different enzyme system than the messenger RNAs that are transcribed from protein-coding genes," Mizzen said.

"The involvement of H1 phosphorylation in controlling ribosomal RNA gene transcription had not been suspected at all previously," Mizzen said. "That was a totally novel finding of our work."

Further experiments revealed that hormone treatments (in this case estradiol and glucocorticoid), stimulate the association of phosphorylated H1 histones with the regulatory regions of hormone-responsive genes.

The new findings could lead to a better understanding of alterations to the cell cycle associated with cancer and other diseases, Zheng said. Some drugs already are on the market that target kinases, the enzymes that phosphorylate other molecules, he said.

"One of the most successful drugs in leukemia treatment is a tyrosine kinase inhibitor, which inhibits a phosphorylation pathway and halts the growth of cancer cells," Zheng said.

The study was a collaborative effort involving researchers from several departments on the U. of I. campus and the National Cancer Institute at the National Institutes of Health. Key collaborators included Illinois chemistry professor Neil Kelleher, Illinois molecular and integrative physiology professor Ann Narduli, and Gordon Hager at the National Cancer Institute.

Kelleher and Mizzen are affiliates of the Institute for Genomic Biology at Illinois.

Funding for this study was provided by the Roy J. Carver Charitable Trust, the March of Dimes and the National Science Foundation.

Story Source:

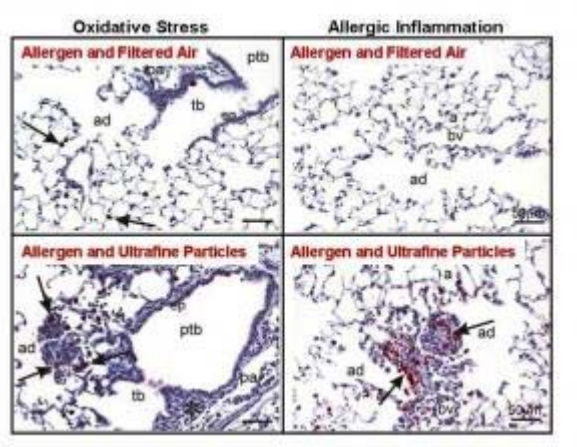
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of Illinois at Urbana-Champaign.

Journal Reference:

1.Y. Zheng, S. John, J. J. Pesavento, J. R. Schultz-Norton, R. L. Schiltz, S. Baek, A. M. Nardulli, G. L. Hager, N. L. Kelleher, C. A. Mizzen. Histone H1 phosphorylation is associated with transcription by RNA polymerases I and II. The Journal of Cell Biology, 2010; 189 (3): 407 DOI: 10.1083/jcb.201001148

http://www.sciencedaily.com/releases/2010/07/100701112606.htm

Ultrafine Particles in Air Pollution May Heighten Allergic Inflammation in Asthma



Oxidative stress and allergic inflammation from filtered air vs. ultrafine particle pollutants. Exposure to ultrafine particles generated significantly stronger oxidative stress (lower left panel) and allergic inflammation (lower right panel) deep in the lung. (Credit: Image courtesy of University of California - Los Angeles)

ScienceDaily (July 5, 2010) — A new academic study led by UCLA scientists has found that even brief exposure to ultrafine pollution particles near a Los Angeles freeway is potent enough to boost the allergic inflammation that exacerbates asthma.

Published online in the American Journal of Physiology-Lung Cellular and Molecular Physiology in June, the study shows that the tiniest air pollutant particles - those measuring less than 180 nanometers, or about one-thousandth the width of a human hair - incited inflammation deep in the lungs. The researchers used a "real-time" testing method in an animal model to isolate the effects of vehicular emission particles on the immune response in the lung.

Since these ultrafine particles are primarily derived from vehicular emissions and are found in highest concentrations on freeways, the results have particular significance for the study of the impact of traffic-related emissions on asthma flares in urban areas.

The findings also point to the importance of understanding the role air-pollution particles play in asthma flares in order to develop new approaches for asthma therapy.

"The immune processes involved in asthma, and current treatments, are traditionally thought to be dominated by a specific initial immune response, but our study shows that ultrafine pollution particles may play an important role in triggering additional pathways of inflammation that heighten the disease," said the study's principal investigator, Dr. Andre E. Nel, professor of medicine and chief of nanomedicine at the David Geffen School of Medicine at UCLA.

Pollution particles emitted by vehicles and other combustion sources are coated with a layer of organic chemicals that can be released into the lungs. These chemicals generate free oxygen radicals, which excite the immune system in the lung through a cell- and tissue-

damaging process known as oxidation. Oxidation contributes to allergic inflammation in the lungs of people with asthma.

Although other studies have shown that larger air-pollution particles can cause an oxidative response in asthma, this is the first study to show that real-time breathing of collected ultrafine pollutant particles triggers the same reaction and may even be more damaging, due to the particles' tiny size, the researchers noted.

Because of their size and large surface area, ultrafine particles have the capacity to carry and deposit a rich load of active organic chemicals deep in the lung. The chemicals coming off the particles in the small airways in the lung promote oxidative stress at those sites.

In the study, researchers initially gave mice a surrogate allergen, similar to exposing humans to an allergen such as pollen. After further sensitization, half the mice received ultrafine pollutants, taken in real time near a freeway in downtown Los Angeles, while the other half breathed filtered air.

The study utilized sophisticated exposure technologies developed by Dr. Costas Sioutas, the Fred Champion Professor of Civil and Environmental Engineering at the University of Southern California and co-director of the Southern California Particle Center. The multicampus team also included researchers from Michigan State University and the University of California, Irvine. The research at the Southern California Particle Center and the UCLA Asthma and Allergic Disease Center was funded by the U.S. Environmental Protection Agency and the National Institutes of Health.

Researchers found that exposure to air containing ultrafine particles for a few hours a day over five days significantly enhanced allergic airway inflammation, which correlated to the changes found in the immune system and genes expressed. Scientists discovered that the most profound effects of the allergic inflammation were observed deep in the lung.

"We found that even small exposure amounts to the ultrafine particles could boost the pro-inflammatory effects," said first author Ning Li, an assistant researcher in the UCLA Division of Nanomedicine.

The level of ultrafine particle exposure in the study was two to five times higher than levels commuters are subject to while traveling in their vehicles on Los Angeles freeways.

Researchers noted that the development of asthma may be more complicated than originally thought, with mounting evidence pointing to the involvement of additional pathways of immune activity associated with the effects of oxidative stress.

"A number of new therapies are now targeting the role of oxidative stress in asthma exacerbation," Nel said. "One possible strategy may be the use of antioxidants that may interfere with development of oxidative stress."

In addition to new considerations for asthma treatment, the study findings may also help epidemiologists further establish the link between surges of pollutants near freeways and asthma flares and to pinpoint the amount of ultrafine particle concentrations involved.

The next stage of research will help identify the chemical components responsible for boosting the effect of particulate pollutants on the allergic inflammation found in asthma and will explore the immunological mechanisms behind it at the molecular level.

Asthma, which affects 15 to 20 million people in the United States, is a chronic inflammatory disease of the small airways in the lung and can trigger acute episodes of airway tightening and wheezing.

Other study authors included Jack R. Harkema, Ryan P. Lewandowski, Meiying Wang, Lori A. Bramble, Glenn Gookin, and Zhi Ning.

Story Source:

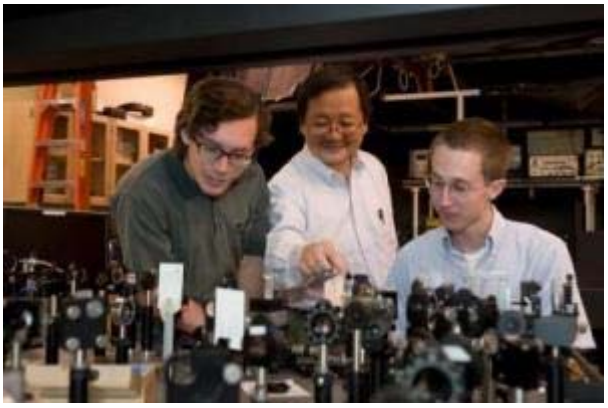
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of California - Los Angeles. The original article was written by Rachel Champeau.

Journal Reference:

1.N. Li, J. R. Harkema, R. P. Lewandowski, M. Wang, L. A. Bramble, G. R. Gookin, Z. Ning, M. T. Kleinman, C. Sioutas, A. E. Nel. Ambient Ultrafine Particles Provide a Strong Adjuvant Effect in the Secondary Immune Response: Implication for Traffic-related Asthma Flares. AJP: Lung Cellular and Molecular Physiology, 2010; DOI: 10.1152/ajplung.00115.2010

http://www.sciencedaily.com/releases/2010/07/100701131209.htm

Super-High Pressures Used to Create Super Battery: 'Most Condensed Form of Energy Storage Outside of Nuclear Energy'



Washington State University chemist Choong-Shik Yoo, seen here with students, has used super-high pressures to create a compact, never-before-seen material capable of storing vast amounts of energy. (Credit: Washington State University)

ScienceDaily (July 5, 2010) — The world's biggest Roman candle has got nothing on this.

Using super-high pressures similar to those found deep in the Earth or on a giant planet, Washington State University researchers have created a compact, never-before-seen material capable of storing vast amounts of energy.

"If you think about it, it is the most condensed form of energy storage outside of nuclear energy," says Choong-Shik Yoo, a WSU chemistry professor and lead author of results published in the journal Nature Chemistry.

The research is basic science, but Yoo says it shows it is possible to store mechanical energy into the chemical energy of a material with such strong chemical bonds. Possible future applications include creating a new class of energetic materials or fuels, an energy storage device, super-oxidizing materials for destroying chemical and biological agents, and high-temperature superconductors.

The researchers created the material on the Pullman campus in a diamond anvil cell, a small, two-inch by three-inch-diameter device capable of producing extremely high pressures in a small space. The cell contained xenon difluoride (XeF2), a white crystal used to etch silicon conductors, squeezed between two small diamond anvils.

At normal atmospheric pressure, the material's molecules stay relatively far apart from each other. But as researchers increased the pressure inside the chamber, the material became a two-dimensional graphite-like semiconductor. The researchers eventually increased the pressure to more than a million atmospheres, comparable to what would be found halfway to the center of the earth. All this "squeezing," as Yoo calls it, forced the molecules to make tightly bound three-dimensional metallic "network structures." In the process, the huge amount of mechanical energy of compression was stored as chemical energy in the molecules' bonds.

Financial support for the research came from the U.S. Department of Defense's Defense Threat Reduction Agency and the National Science Foundation.

Story Source:

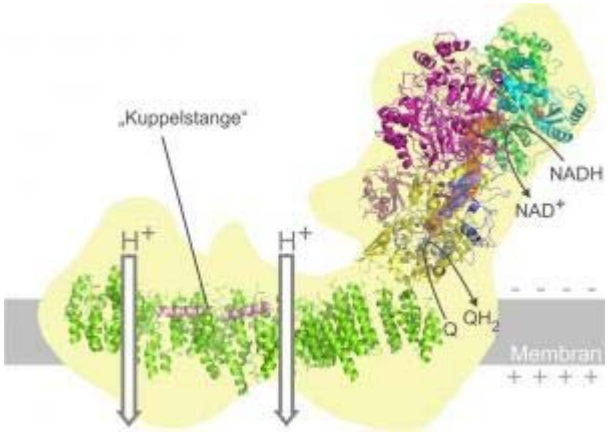
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by Washington State University, via EurekAlert!, a service of AAAS.

Journal Reference:

1.Minseob Kim, Mathew Debessai & Choong-Shik Yoo. Two- and three-dimensional extended solids and metallization of compressed XeF2. Nature Chemistry, 2010; DOI: 10.1038/nchem.724

http://www.sciencedaily.com/releases/2010/07/100704162218.htm

Architecture of the Largest Protein Complex of Cellular Respiration Elucidated



The structural model of mitochondrial complex I provides new insights in energy conversion at nanoscale. A molecular coupling device links pump modules in the membrane arm of the huge enzyme complex. (Credit: Image courtesy of Albert-Ludwigs-Universität Freiburg)

ScienceDaily (July 5, 2010) — Scientists of the University of Freiburg and the University of Frankfurt have elucidated the architecture of the largest protein complex of the cellular respiratory chain.They discovered an unknown mechanism of energy conversion in this molecular complex. The mechanism is required to utilize the energy contained in food.

After ten years of research work, the x-ray crystallographic analysis of the huge and most complicated protein complex of the mitochondrial respiratory chain was successful. The complex contains more than 40 different proteins, marks the entry to cellular respiration and is thus also called mitochondrial complex I. The results are published in the current online-edition of the journal Science.

A detailed understanding of the function of complex I is of special medical interest. Dysfunction of the complex is implicated in several neurodegenerative diseases such as Parkinson´s disease or Alzheimer´s disease, and also with the physiological processes of biological aging, in general. The work of Prof. Carola Hunte of the Freiburg Institute for Biochemistry and Molecular Biology and the Freiburg excellence centre BIOSS (Centre for Biological Signalling Studies) in cooperation with Prof. Ulrich Brandt, Professor for Molecular Bioenergetics and member of the excellence centre „Macromolecular Complexes" and Dr. Volker Zickermann of his research group is a major step forward to this understanding.

The energy metabolism takes place in the so-called powerhouses of the cell, the mitochondria. They transduce the energy taken up as food into adenosine triphosphate, in short ATP, which is the universal energy currency of life. A chain of five complicated molecular machines in the mitochondrial membrane are responsible for the energy conversion. The production of ATP in mitochondria requires so many steps, as it is in principal a Knallgasreaction. In a laboratory experiment, hydrogen and oxygen gas would react in an explosion and the energy contained would be released as heat. In biological oxidation, the energy will be released by the membrane bound protein complexes of the respiratory chain in a controlled manner in small packages. Comparable to a fuel cell, this process generates an electrical membrane potential, which is the driving force of ATP synthesis. The total surface of all mitochondrial membranes in a human body covers about 14.000 square meter. This accounts for a daily production of about 65 kg of ATP.

The now presented structural model provides important and unexpected insights for the function of complex I. A special type of „transmission element," which is not known from any other protein, appears to be responsible for the energy transduction within the complex by mechanical nanoscale coupling. Transferred to the technical world, this could be described as a power transmission by a coupling rod, which connects for instance the wheels of a steam train. This new nano-mechanical principle will now be analysed by additional functional studies and a refined structural analysis.

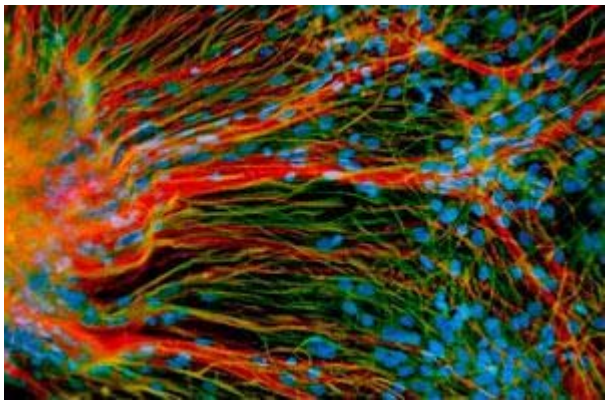
Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by Albert-Ludwigs-Universität Freiburg, via AlphaGalileo.

Journal Reference:

1.C. Hunte, V. Zickermann, U. Brandt. Functional Modules and Structural Basis of Conformational Coupling in Mitochondrial Complex I. Science, 2010; DOI: 10.1126/science.1191046
http://www.sciencedaily.com/releases/2010/07/100702100414.htm

Gene Regulating Human Brain Development Identified



The discovery of a gene that serves as a master regulator of human brain development will make it far easier for scientists to forge neurons like these in the lab dish for transplant and for modeling diseases of the brain and central nervous system. The influence of the gene on human brain development was discovered in the Waisman Center laboratory of neuroscientist Su-Chun Zhang. (Credit: Photo courtesy Su-Chun Zhang)

ScienceDaily (July 4, 2010) — With more than 100 billion neurons and billions of other specialized cells, the human brain is a marvel of nature. It is the organ that makes people unique.

Now, writing in the journal Cell Stem Cell (July 1, 2010), a team of scientists from the University of Wisconsin-Madison has identified a single gene that seems to be a master regulator of human brain development, guiding undifferentiated stem cells down tightly defined pathways to becoming all of the many types of cells that make up the brain.

The new finding is important because it reveals the main genetic factor responsible for instructing cells at the earliest stages of embryonic development to become the cells of the brain and spinal cord. Identifying the gene -- known as Pax6 -- is a first critical step toward routinely forging customized brain cells in the lab.

What's more, the work contrasts with findings from animal models such as the mouse and zebrafish, pillars of developmental biology, and thus helps cement the importance of the models being developed from human embryonic stem cells.

The new work, conducted in the Waisman Center laboratory of UW-Madison neuroscientist Su-Chun Zhang, reveals the pervasive influence of Pax6 on the neuroectoderm, a structure that arises early in embryonic development and that churns out the two primary forms of brain cells -- neurons and glial cells -- and the hundreds of cell subtypes that make up the human brain.

"This is a well-known gene," says Zhang, a professor of anatomy in the UW School of Medicine and Pubic Health. "It's been known for a long time from work in mice and other animals, but what Pax6 does in human development isn't very well known."

In animals, the gene is known to play a role in the development of the eye and is seen in some neural cells. In the human cells used in the new Wisconsin study, Pax6 was observed in virtually all of the cells of the neuroectoderm. "The fact that Pax6 is uniformly expressed in all human neuroectoderm cells was a surprise,"

Zhang explains. "This is a phenomenon that is a departure from what we see in animals. It seems that in the earliest stages of development, human cells are regulated by different processes."

The finding may help explain why the human brain is larger and, in many respects, more advanced than what is observed in other species. In the laboratory dish, human brain stem cells are chock full of Pax6 and produce a large volume of cortical cells, notes Xiaoqing Zhang (no relation to Su-Chun Zhang), a UW-Madison neuroscientist and the lead author of the Cell Stem Cell paper.

"In human brain development, this plays a really important role," says Xiaoqing Zhang. "In humans, the cortex is a major part of the brain. In the mouse, the cortex is a much smaller part of the brain."

Adds Su-Chun Zhang, "In a way, it makes sense that the human brain is regulated in a different way. The brain distinguishes the human as a unique species."

In practical terms, the new finding will help scientists refine and improve techniques for making specific types of neural cells. Such cells will be critical for future research, developing new models for disease, and may one day be used in clinical settings to repair the damaged cells that cause such conditions as Parkinson's disease and amyotrophic lateral sclerosis or Lou Gehrig's disease.

"This gives us a precise and efficient way to guide stem cells to specific types of neural cells," says Xiaoqing Zhang. "We can activate this factor and convert stem cells to a particular fate."

The discovery of the new role of Pax6, says Su-Chun Zhang, is the first time researchers have discovered a single genetic factor in human cells that is responsible for shepherding blank slate stem cells to become a particular tissue stem cell type. "Until now, for any organ or tissues, we didn't know any determinant factors. This is the first," he says.

There are certainly other genes at play in the cells of the developing brain, says Su-Chun Zhang: "You may need additional genes, but they're in a supporting role. Pax6 is the key."

The National Institutes of Neurological Diseases and Stoke, part of the National Institutes of Health, supported the new study.

Story Source:

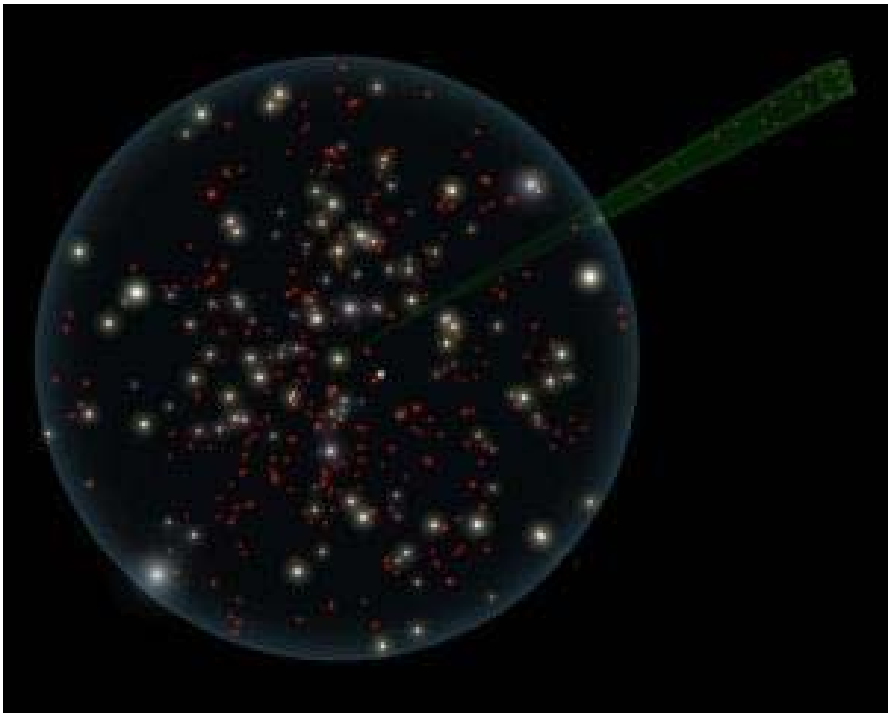
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of Wisconsin-Madison.

Journal Reference:

1.Xiaoqing Zhang, Cindy T. Huang, Jing Chen, Matthew T. Pankratz, Jiajie Xi, Jin Li, Ying Yang, Timothy M. LaVaute, Xue-Jun Li, Melvin Ayala, Gennadiy I. Bondarenko, Zhong-Wei Du, Ying Jin, Thaddeus G. Golos, Su-Chun Zhang. Pax6 Is a Human Neuroectoderm Cell Fate Determinant. Cell Stem Cell, Volume 7, Issue 1, 90-100, 2 July 2010 DOI: 10.1016/j.stem.2010.04.017

http://www.sciencedaily.com/releases/2010/07/100701131159.htm

Spitzer Spies Frigid Brown Dwarfs



This artist's concept shows simulated data predicting the hundreds of failed stars, or brown dwarfs, that NASA's Wide-field Infrared Survey Explorer (WISE) is expected to add to the population of known stars in our solar neighborhood. (Credit: AMNH/UCB/NASA/JPL-Caltech)

ScienceDaily (July 4, 2010) — Astronomers have uncovered what appear to be 14 of the coldest stars known in our universe. These failed stars, called brown dwarfs, are so cold and faint that they'd be impossible to see with current visible-light telescopes. Spitzer's infrared vision was able to pick out their feeble glow, much as a firefighter uses infrared goggles to find hot spots buried underneath a dark forest floor.

The brown dwarfs join only a handful of similar objects previously discovered. The new objects are between the temperatures of about 450 Kelvin to 600 Kelvin (350 to 620 degrees Fahrenheit). As far as stars go, this is bitter cold -- as cold, in some cases, as planets around other stars.

These cool orbs have remained elusive for years, but will soon start coming out of the dark in droves. NASA's Wide-field Infrared Survey Explorer (WISE) mission, which is up scanning the entire sky now in infrared wavelengths, is expected to find hundreds of objects of a similarly chilly disposition, if not even colder. WISE is searching a volume of space 40 times larger than that sampled in the recent Spitzer study, which concentrated on a region in the constellation Boötes. The Spitzer mission is designed to look at targeted patches of sky in detail, while WISE is combing the whole sky.

"WISE is looking everywhere, so the coolest brown dwarfs are going to pop up all around us," said Peter Eisenhardt, the WISE project scientist at NASA's Jet Propulsion Laboratory, Pasadena, Calif., and lead author

of a recent paper in the Astronomical Journal on the Spitzer discoveries. "We might even find a cool brown dwarf that is closer to us than Proxima Centauri, the closest known star."

Brown dwarfs form like stars out of collapsing balls of gas and dust, but they are puny in comparison, never collecting enough mass to ignite nuclear fusion and shine with starlight. The smallest known brown dwarfs are about 5 to 10 times the mass of our planet Jupiter -- that's as massive as some known gas-giant planets around other stars. Brown dwarfs start out with a bit of internal heat left over from their formation, but with age, they cool down. The first confirmed brown dwarf was announced in 1995.

"Brown dwarfs are like planets in some ways, but they are in isolation," said astronomer Daniel Stern, co-author of the Spitzer paper at JPL. "This makes them exciting for astronomers -- they are the perfect laboratories to study bodies with planetary masses."

Most of the new brown dwarfs found by Spitzer are thought to belong to the coolest known class of brown dwarfs, called T dwarfs, which are defined as being less than about 1,500 Kelvin (2,240 degrees Fahrenheit). One of the objects appears to be so cold that it may even be a long-sought Y dwarf -- a proposed class of even colder stars. The T and Y classes are part of a larger system categorizing all stars; for example, the hottest, most massive stars are O stars; our sun is a G star.

"Models indicate there may be an entirely new class of stars out there, the Y dwarfs, that we haven't found yet," said co-author Davy Kirkpatrick, a co-author of the study and a member of the WISE science team at the California Institute of Technology, Pasadena, Calif. "If these elusive objects do exist, WISE will find them." Kirkpatrick is a world expert in brown dwarfs -- he came up with L, T and Y classifications for the cooler stars.

Kirkpatrick says that it's possible that WISE could find an icy, Neptune-sized or bigger object in the far reaches of our solar system -- thousands of times farther from the sun than Earth. There is some speculation amongst scientists that such a cool body, if it exists, could be a brown dwarf companion to our sun. This hypothetical object has been nicknamed "Nemesis."

"We are now calling the hypothetical brown dwarf Tyche instead, after the benevolent counterpart to Nemesis," said Kirkpatrick. "Although there is only limited evidence to suggest a large body in a wide, stable orbit around the sun, WISE should be able to find it, or rule it out altogether."

The 14 objects found by Spitzer are hundreds of light-years away -- too far away and faint for ground-based telescopes to see and confirm with a method called spectroscopy. But their presence implies that there are a hundred or more within only 25 light-years of our sun. Because WISE is looking everywhere, it will find these missing orbs, which will be close enough to confirm with spectroscopy. It's possible that WISE will even find more brown dwarfs within 25-light years of the sun than the number of stars known to exist in this space.

"WISE is going to transform our view of the solar neighborhood," said Eisenhardt. We'll be studying these new neighbors in minute detail -- they may contain the nearest planetary system to our own."

Other authors of the Spitzer paper are Roger Griffith and Amy Mainzer of JPL; Ned Wright, A.M. Ghez and Quinn Konopacky of UCLA; Matthew Ashby and Mark Brodwin of the Harvard-Smithsonian Center for Astrophysics, Cambridge; Mass., Michael Brown of Monash University, Australia; R.S. Bussmann of the University of Arizona, Tucson; Arjun Dey of National Optical Astronomy Observatory, Tucson, Ariz.; Eilat

Glikman of Caltech; Anthony Gonzalez and David Vollbach of the University of Florida, Gainesville; and Shelley Wright of the University of California, Berkeley.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. Caltech manages JPL for NASA.

JPL manages the Wide-field Infrared Survey Explorer for NASA's Science Mission Directorate, Washington. The principal investigator, Edward Wright, is at UCLA. The mission was competitively selected under NASA's Explorers Program managed by the Goddard Space Flight Center, Greenbelt, Md. The science instrument was built by the Space Dynamics Laboratory, Logan, Utah, and the spacecraft was built by Ball Aerospace & Technologies Corp., Boulder, Colo. Science operations and data processing take place at the Infrared Processing and Analysis Center at the California Institute of Technology in Pasadena. Caltech manages JPL for NASA.

For more information about Spitzer, visit http://spitzer.caltech.edu/ and http://www.nasa.gov/spitzer. More information about WISE is online at http://wise.astro.ucla.edu and http://www.nasa.gov/wise.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by NASA/Jet Propulsion Laboratory.

http://www.sciencedaily.com/releases/2010/06/100629112152.htm

Nutrition's Potential to Save Sight

Studies by scientists such as epidemiologist Chung-Jung Chiu (left) and biochemist Allen Taylor are showing that regularly eating a combination of protective nutrients and a low-glycemic-index diet may protect people from vision loss due to age-related macular degeneration. (Credit: Photo by Stephen Ausmus)

ScienceDaily (July 4, 2010) — While 20/20 vision is a symbol of visual acuity, between now and the year 2020, more and more people will experience some extent of vision loss due to age-related macular degeneration (AMD) and other sight-robbing diseases.

Now, Agricultural Research Service (ARS)-funded scientists at the Laboratory for Nutrition and Vision Research are finding that healthy eating can reduce not only health care costs, but also the decline of quality of life due to these diseases. The laboratory, directed by Allen Taylor, is part of the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, Mass.

One study indicated that regularly consuming a combination of protective nutrients and a low-glycemic-index, or "slow carb," diet provided an AMD protective effect. A food's glycemic index is an indicator of how fast the carbohydrate it contains will spike blood sugar levels. The macula is a 3-millimeter-wide yellow spot near the center of the retina responsible for the central field of vision.

For the study, the researchers analyzed dietary intake and other data from more than 4,000 men and women, aged 55 to 80, who had participated in the long-term Age-Related Eye Disease Study, or AREDS. Led by Chung-Jung Chiu, the researchers ranked intake of each of several nutrients consumed during the AREDS study, then calculated a compound score to gauge their combined dietary effect on the risk of AMD. The scoring system allowed them to evaluate associations between individual -- and combined -- dietary nutrients.

The nutrients that were found to be most protective in combination with the low-glycemic-index diet were vitamins C and E, zinc, lutein, zeaxanthin, and the omega-3 fatty acids known as DHA and EPA. The 2009 study was published in Ophthalmology.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by USDA/Agricultural Research Service. The original article was written by Rosalie Marion Bliss.

http://www.sciencedaily.com/releases/2010/07/100701145537.htm

Laughter's secrets: No funny business

- 14 July 2010 by **Kate Douglas**
- Magazine issue 2769.

"What are you laughing at?" Ignoring any aggressive intent, the answer is obvious: I am laughing because something you said amused me.

Right? Wrong. According to a classic study of laughter by Robert Provine of the University of Maryland, Baltimore County, and his colleagues, laughter is an unexpectedly serious business. Observing the human animal in its natural habitat - the shopping mall - they documented 1200 instances of laughter, and found that only 10 to 20 per cent of them were responses to anything remotely resembling a joke. Most laughter was in fact either triggered by a banal comment or used to punctuate everyday speech. Furthermore, says Provine in his book *Laughter: A scientific investigation*, we are 50 per cent more likely to laugh when speaking than when listening, and 30 times gigglier in a social setting than when alone without a social surrogate such as a television.

Provine's conclusion was that the essential ingredient for laughter is not a joke but another person. Laughter is far more general than just a response to humour: it is a social glue that we use in all sorts of ways to bind ourselves together.

As such, it comes in many guises. Our first laughs occur at between 2 and 6 months of age - even in deaf babies. They are triggered by surprise in a safe situation (think peek-a-boo), and don't just endear babies to their parents. Since laughter is associated with activity in the brain's dopamine reward circuitry, it encourages babies to explore the world by making them feel happy and safe. When infants begin to engage in rough-and-tumble play, laughter signals that the intentions are not serious, allowing children to test physical and social boundaries without serious jeopardy.

The conversational laughter Provine observed essentially acts as a social lubricant. It engages listeners and dispels tension, aggression and competition by putting people at ease. Nervous laughter can make light of a stressful or psychologically difficult situation. And, through its catching nature (see "Why is laughter contagious?"), laughter can unify the mood and behaviour of a group, promoting coordinated activity for the greater good (*The Quarterly Review of Biology*, vol 80, p 395).

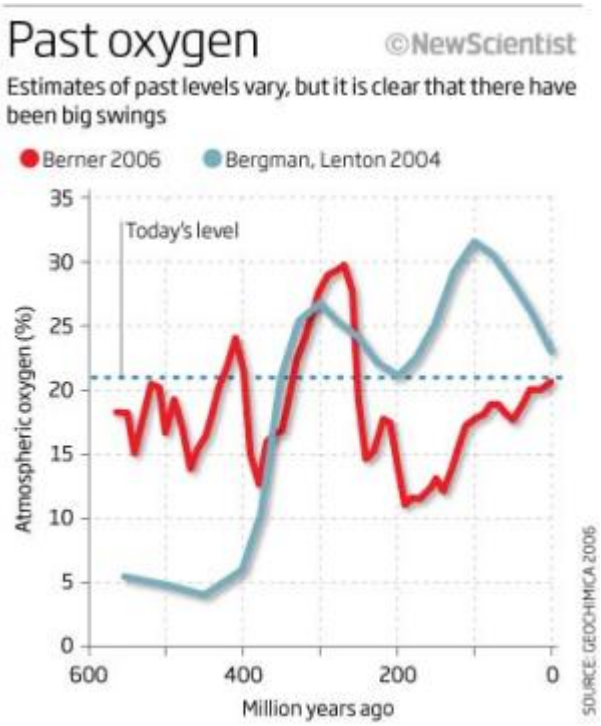
Laughter also has a darker side. "You can influence the behaviour of others through laughter," says Michael Owren, a psychologist at Georgia State University in Atlanta. He believes that as we master the subtle cues of laughter, so we begin to use it to manipulate those around us. An "in" joke can exclude outsiders from a clique, for example. Laughter can be used to show who is boss and malicious laughter is an effective weapon of intimidation.

Kate Douglas is a feature editor for New Scientist.

http://www.newscientist.com/article/mg20727691.400-laughters-secrets-no-funny-business.html

O_2h no! Is our oxygen running out?

- 14 July 2010 by **Stephen Battersby**
- Magazine issue 2769.



Past oxygen

I HAVE been feeling a little short of breath on mountain paths lately, and it took me ages to light the barbecue last week. I wonder why? Perhaps it's something to do with a lack of exercise, an excess of beer, some damp charcoal... But wait, there is a much simpler explanation: these days, there isn't enough oxygen in the air.

So say many websites - sites that just happen, by wild coincidence, to sell solutions to this atmospheric catastrophe in the form of "liquid oxygen" supplements, personal oxygen generators, even oxygen-laden skin-creams. As *New Scientist*'s Feedback column has noted over the years, these snake-oil salesmen exploit a bafflingly persistent myth, that industrial activity has sucked much of the oxygen out of the air.

Some claim that a couple of hundred years ago the "natural" level of oxygen in the atmosphere was 38 per cent, others that large cities such as Tokyo, Japan, now have oxygen levels as low as 5 per cent. In fact, the oxygen content of the air worldwide is about 21 per cent, the same as it was for the Victorians, the Romans and the Neanderthals. All those claims that the sky is falling are utter nonsense. Well, almost.

It is true that human activity is causing a steady, measurable decline in the oxygen content of the world's air, although as yet this decline is negligible. But if we continue to burn fossil fuels for centuries more, levels could fall much further. Should we be worried?

Since 1989, Ralph Keeling has been monitoring oxygen levels around the globe. As well as continuous measurements at permanent monitoring stations, flasks of air are captured in some of the wilder parts of the planet, such as Cold Bay in Alaska and Cape Grim in Tasmania, and sent to Keeling's lab at the University of California, San Diego, for analysis.

Originally, Keeling measured the speed of light in the air samples with a laser beam. Because light moves faster in oxygen than nitrogen, this reveals the oxygen content. Now he and his collaborators use several methods, including mass spectroscopy and ultraviolet probes. Some of these techniques are being used on board a plane that is zigzagging from pole to pole. All the methods give the same result: the concentration of oxygen is declining everywhere at the same rate, about 20 parts per million (ppm) per year. In other words, for every million molecules of O_2 in the air in 1989, there are now only about 999,600.

This fall comes as no surprise. When you burn a hydrocarbon fuel such as oil, its hydrogen and carbon atoms combine with oxygen from the atmosphere to create water and carbon dioxide. As we drive up levels of CO_2 by burning fossil fuels, we also deplete oxygen.

In fact, Keeling's measurements have shown that oxygen is declining less rapidly than expected, probably because plants are enjoying a brief bonanza. As they have exploited the higher levels of CO_2, the total amount of biomass on the planet has increased, and in the process extra oxygen has been pumped out.

This probably won't last. Studies of Earth's past suggest that the total biomass will soon stabilise - or more likely start to decline. That means the drop in oxygen will depend largely on how much more fossil fuel we burn.

Say we guzzle all the easily accessible fuels - all the coal, oil and gas that can be economically hacked or pumped from the Earth today. In total, that is estimated to be roughly 1200 billion tonnes of carbon, mostly in the form of coal. Burning the lot would mean we lose 3600 ppm of our oxygen, so the level would fall from today's 20.95 per cent of the atmosphere down to 20.87 per cent.

Hardly suffocating, then, but that may not be the end of the story. The Earth holds other, less-accessible fuels, such as tar sands, and a more exotic possibility in the form of icy methane hydrates. In the pessimistic "A2 scenario" looked at by the Intergovernmental Panel on Climate Change, a world undergoing slow technological change but high population growth burns 3700 billion tonnes of carbon over the next two centuries. This would translate to a loss of about 1.1 per cent of our present stock of oxygen - down to 20.7 per cent of the atmosphere.

Natural lows

To get a feel for what this would mean, bear in mind that the amount of oxygen in a given volume of air changes with atmospheric pressure, and the local pressure changes with the weather. When it is raining, one lungful of air will often have a few per cent less oxygen than on an average day - a larger reduction than in our pessimistic scenario above. Or you could get much the same reduction by climbing from sea level up a hill just 100 metres high. In other words, a fall to 20.7 per cent would make hardly any difference.

When it rains, each lungful of air contains less oxygen than normal

Estimating fuel reserves is far from a precise science, however. In fact, there is undoubtedly much, much more buried carbon than any estimates of fossil fuel reserves suggest - more than enough to consume every last bit of oxygen in the atmosphere if it was burned (see "Suffocating saurians"). Perhaps fortunately, the vast majority of this carbon is spread very thinly, forming only a very minor ingredient in rocks. It is useless as fuel, because it would take more energy to extract than would be gained by burning it.

Still, according to some analyses as much as 25,000 billion tonnes of carbon might be recoverable. These estimates are based largely on old figures for the total amount of methane hydrates that are now thought to be too high, but let's be extremely pessimistic, and assume that they are right - and that we are ingenious enough and unwise enough to extract and burn all this carbon, or trigger its release. That would consume nearly 8 per cent of our oxygen, causing levels to drop to just 19.4 per cent of the atmosphere. Surely that would cause serious problems?

Probably not, says physiologist Mike Grocott of University College London, who studies the effects of hypoxia on hospital patients and mountain climbers. "I'd be very surprised if there was any widespread medical effect - although I'd expect patients who already have low blood oxygen levels due to severe cardiac or respiratory conditions to be at greater risk of complications."

Athletes would find it harder to break records, says Grocott, and climbing high mountains will become a little more difficult. "Everest is already on the threshold of what's possible without supplemental oxygen. It might become impossible for most people."

Somewhat more seriously, people living in parts of the high Andes and the Himalayas would find life even tougher. Physical labour would become harder, for instance, and infant mortality would increase. That would be worrying - if it weren't for the vastly greater peril of extreme climate change caused by burning all that carbon. With the ice caps rapidly melting, today's coasts being inundated and the tropics turning into desert, the least of the world's worries will be a few wheezing yaks.

While there is far more reason to worry about rising CO_2 than falling O_2, we could still create a real oxygen crisis - not on land, but in the oceans. As atmospheric oxygen levels fall, less oxygen will dissolve in seawater, depleting levels slightly. Worse still, the warmer seawater gets, the less oxygen it can hold.

The effect of both these processes has been modelled by Gary Shaffer and his colleagues at the Danish Centre for Earth System Science in Humlebaek. In their worst case, based on the A2 scenario, oxygen levels in the top 500 metres of the oceans could drop by more than 20 per cent by the year 4000 (*Nature Geoscience*, vol 2, p 105).

"Dead zones" with almost no oxygen already make up around 2 per cent of the oceans by area, and they could expand seven-fold. "Fish can swim away, but the area of ocean they inhabit will become smaller," says Shaffer. Some species are more tolerant to low oxygen levels, and of course marine mammals and seabirds get their supply from the atmosphere, but they would all fall victim to an indirect menace. Low oxygen levels encourage the growth of bacteria that destroy nitrate - a vital nutrient for the ocean's microscopic plants, or phytoplankton. The phytoplankton are the base of the main marine food chain, eaten by zooplankton, which are eaten by fish, and so on. Take them away and the whole ecosystem collapses.

As if that weren't bad enough, the bacteria that thrive in low oxygen conditions emit a powerful greenhouse gas, nitrous oxide. If we suffocate the sea, it might take its revenge.

Suffocating saurians

Three hundred million years ago, dragonflies and millipedes grew to frankly disturbing sizes - thanks in part to levels of oxygen in the atmosphere as high as 30 per cent. What created this abundance, and what brought oxygen back down to today's less heady levels?

It is all to do with the fate of plants. Plants emit oxygen while they are photosynthesising, but the same amount of oxygen is used up if the carbon compounds they make are broken down. To boost oxygen in the long term, organic matter must be buried beyond the reach of hungry bugs and beasts. Most of the oxygen in our air came from plants whose remains - or those of the animals that fed on them - became entombed in sedimentary rocks.

As the crust shifts, however, it can bring sediments containing ancient corpses back to the surface, where they decompose, removing oxygen from the atmosphere once more. Gases from organic material buried deep in the Earth can also escape to the surface, where they react with oxygen. So oxygen levels can go down as well as up, depending on the balance between burial and exhumation.

When plants conquered the land they found new places to grow and new ways to be buried, gradually boosting atmospheric oxygen. This eventually resulted in the oxygen-rich atmosphere of the Carboniferous period around 340 to 280 million years ago. "The Carboniferous had lush swampy forests, perfect for burying carbon" says Tim Lenton of the University of East Anglia in Norwich, UK.

Later, the continents moved together to create large, dry supercontinents much less hospitable to verdant plant life. The balance swung against burial, and oxygen levels fell.

What happened next, during the age of the dinosaurs from 230 to 60 million years ago, is more controversial. According to Lenton and his colleagues, oxygen levels increased once more before falling to present day levels. However Robert Berner of Yale University thinks oxygen levels plummeted after the Carboniferous before slowly rising to present day levels (see graph). Both conclusions are based on models that are broadly similar, but involve on somewhat different assumptions.

So did the dinosaurs have to breathe heavily despite their efficient bird-like lungs, or could they take leisurely sniffs of the air? The jury is still out, though fossil charcoal shows that forest fires were common at the time. This would be difficult to explain if oxygen levels fell below 15 per cent, as Berner's model suggests, because fires should not occur below this level.

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http://www.newscientist.com/article/mg20727692.000-o2h-no-is-our-oxygen-running-out.html?DCMP=NLC-nletter&nsref=mg20727692.000

'Cuddle chemical' eases symptoms of schizophrenia

- 16 July 2010 by **Andy Coghlan**
- Magazine issue 2769.

NASAL sprays containing the hormone oxytocin, nicknamed the "cuddle chemical"

because it helps mothers bond with their babies, have helped people with schizophrenia.

Although the 15 participants used the sprays for three weeks only, most reported measurable improvements in their symptoms in this the first trial to test oxytocin in schizophrenia. "It's proof of concept that there's therapeutic potential here," says David Feifel at the University of California in San Diego, head of the team running the trial.

Most participants reported measurable improvements in the first ever trial to test oxytocin in schizophrenia

Each participant received oxytocin or a placebo for three weeks, then the opposite treatment for three weeks with a week break in between.

On the basis of two standard tests for schizophrenia, taken before and after each block of treatment, participants averaged improvements of around 8 per cent when taking the oxytocin compared with the placebo (*Biological Psychiatry*, DOI: 10.1016/j.biopsych.2010.04.039).

The effects didn't kick in until the final week, suggesting that it takes a while for the hormone to begin acting. "Standard antipsychotic drugs increase their efficacy several weeks later too, so oxytocin fits that profile," says Feifel.

Feifel thinks that oxytocin is dampening down the excessive production of the neurotransmitter dopamine, which can trigger schizophrenic symptoms such as hallucinations. He says the rationale for treating people came from his own team's studies showing that oxytocin could relieve a form of psychosis in mice, and research showing that people who sniffed nasal sprays of oxytocin became more trusting, which could ease paranoia symptoms in schizophrenia.

Feifel is seeking approval from the US National Institutes of Health for a larger trial testing oxytocin at a range of doses, and over a longer time.

"This work provides compelling data on the utility of oxytocin as a treatment for schizophrenia," says Heather Caldwell of Kent State University in Ohio, co-author of a study in 2008 showing that "knockout" mice unable to make oxytocin were more prone to a form of psychosis.

http://www.newscientist.com/article/mg20727694.300-cuddle-chemical-eases-symptoms-of-schizophrenia.html

Bit of a crybaby? Blame your serotonin levels

- 15 July 2010 by **Linda Geddes**

Magazine issue 2769.

Enough to make you weep (Image: Nick Daly/Stone/Getty)

NEXT time a sentimental movie makes you cry, blame your serotonin levels. Differences in the neurotransmitter might explain why some people are more prone to crying in emotional situations than others.

Frederick van der Veen's team at the Erasmus Medical Centre in Rotterdam, the Netherlands, gave 25 female volunteers a single dose of either paroxetine - a selective serotonin reuptake inhibitor (SSRI) which briefly increases serotonin levels - or a placebo. Four hours later they were asked to watch one of two emotional movies: *Brian's Song*, in which the hero dies of cancer, or *Once Were Warriors*, about domestic violence, and to indicate if, and to what extent certain scenes had made them cry.

On another day, the women watched the second film with their treatments swapped over. "It didn't matter which movie they saw, we saw a strong and consistent effect of paroxetine," says van der Veen, who presented the results at the Forum of European Neuroscience in Amsterdam last week. "Higher serotonin levels lead to less crying."

Although SSRIs are used to treat depression, their mood-boosting effects do not normally show up for around six weeks. The women reported no change in mood in the current study. "We're looking at the direct effect of a single dose of paroxetine," says van der Veen, who adds that the findings might help explain why some people report blunted emotions when taking SSRIs.

"Our understanding of the neurobiology of crying is fairly limited," says Christopher Lowry, a serotonin researcher at the University of Boulder in Colorado. "It makes sense that it is tapping into circuitry involving serotonin."

Van der Veen now wants to find out whether genetic differences in serotonin production affect the tendency to cry.

http://www.newscientist.com/article/mg20727694.400-bit-of-a-crybaby-blame-your-serotonin-levels.html

Artificial lungs breathe new hope for transplants

- 17:04 14 July 2010 by **Caitlin Stier**

First it was the heart, then the liver – now two research teams have grown artificial lungs that function in rats. It is hoped that a similar technique could one day engineer donor organs for humans.

A lung transplant is the only option for people with terminal lung disease caused by conditions like cystic fibrosis or chronic obstructive pulmonary disease. But donor organs are in short supply, and rejection is likely even if a lung becomes available.

In a quest to solve both problems, teams from Harvard Medical School in Boston and Yale University, working separately, stripped donor rat lungs of their original tissue by exposing them to a mild detergent. The teams then repopulated the remaining "scaffold" of connective tissue with foetal stem cells and incubated the organs in nutrients to help them grow.

The new lungs were then "replumbed" into rat recipients. The regenerated lungs resembled native lungs in size and oxygenated the recipient's blood for up to six hours, after which oedema – accumulation of fluid within the lung – and capillary leakage occurred.

Just a matter of time

To make it into the clinic, future work will require better donor cell lines and the patience to wait for the tissue's complete development, says lung tissue engineer Joan Nichols at the University of Texas Medical Branch in Galveston.

Currently, the artificial lungs have the same alveolar structure, size and function as native lungs, but they lack the full range of cell types. For example, they do not have enough cells that secrete surfactant. "A lung is all these different cells that interplay to allow the function of breathing," says Nichols.

Nichols suspects the problems both teams encountered with transplant viability and oedema could be resolved by keeping the new organs in culture longer.

Although she commends the work so far, Nichols says the real breakthroughs are yet to come: "The really big prize is to produce an organ that you can keep in the animal for at least a day or so."

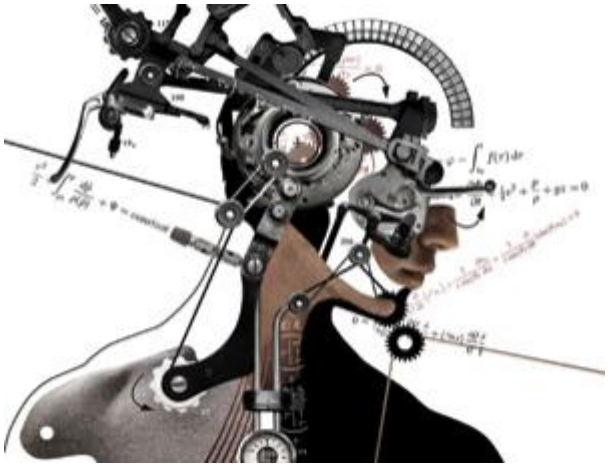
Journal references: *Nature Medicine*, DOI: 10.1038/nm.2193, and *Science*, DOI: 10.1126/science.1189345

http://www.newscientist.com/article/dn19173-artificial-lungs-breathe-new-hope-for-transplants.html

Crunching cancer with numbers

- 13 July 2010 by **Lizzie Buchen**

Magazine issue 2768.



Taming a global killer (Image: Skizzomat/Marie Emmermann

WHEN Danny Hillis spent a day watching a top surgeon perform keyhole cancer surgery, he was left both exhilarated and depressed. The clinical precision with which the surgeon opened up the patient, used state-of-the-art robotic tools to remove their tumour, and sewed them back up again was breathtaking. It was also deeply disheartening. "With all our science, the best we can do is try to cut the cancer out with a knife," says Hillis. "That is the caveman approach to disease."

A few years ago, what he thought would not have mattered. Hillis is a celebrated computer architect who pioneered the concept of massively parallel computing. His accomplishments include using a children's construction set to build a computer, now exhibited at the Museum of Science in Boston, designing a mechanical clock that will keep time for 10,000 years and creating cutting-edge computer systems for Walt Disney theme park rides and animations. Impressive, but hardly a convincing resumé to pronounce on the shortcomings of modern cancer surgery.

Hillis had designed theme-park rides for Disney - hardly a convincing resumé to pronounce on modern cancer surgery

But Hillis's thoughts and expertise do matter. According to the World Health Organization, this year cancer is set to overtake heart disease as the leading cause of death in developed countries. While traditional biological approaches to understanding and combating cancer have had some great successes, mortality rates remain stubbornly high. That's why last year the US National Cancer Institute (NCI) enlisted Hillis and other high-powered researchers from physics, engineering, mathematics and computer science to see what extra ammunition they might supply.

The newcomers will not be required to design new death rays or high-powered imaging devices for tumours, the traditional metier of physical scientists. Instead, they will harness the mathematical tools and the broad-

brush approaches of their disciplines for a new goal: to find simple laws that describe a cancer cell's fate as surely as they do a falling apple.

That is a world away from the traditional, "bottom up" approach to looking at cancer. For the past few decades, research into the disease has focused on its molecular basis: identifying the genetic mutations and protein abnormalities that underlie it, and designing drugs to treat them. The US Food and Drug Administration has approved something like 150 cancer medicines stemming from this approach. Coupled with earlier diagnoses, the result has been a decline in death rates from almost all cancers in wealthy nations.

Yet all too often those advances have been incremental. In the US, for example, the five-year survival rate for pancreatic cancer increased from 3 per cent in 1975 to just 5 per cent in 2004. "We have a lot of drugs, but they're not doing that much," says David Agus, an oncologist at the University of Southern California (USC) in Los Angeles. "They haven't really changed the playing field."

The trouble is that if its normal pathway to growth is blocked by a drug, a tumour will often simply evolve and find new molecular channels through which to grow and prosper. "We keep hammering at each individual signalling molecule, but we forget that there's this whole complex system that it is interacting with," says Agus.

It was Agus who invited Hillis to see cancer surgery at first hand. Bizarrely, the impetus for their collaboration came from former US vice-president Al Gore. In 2003 Gore visited the centre in Los Angeles where Agus was pioneering techniques to understand how communication between proteins affects the onset and progression of cancer. The project was producing huge amounts of data, and Gore suggested it might benefit from specialist number-crunching expertise. "He said I could really benefit from getting an engineer or a mathematician involved, and suggested Hillis," says Agus. "I thought, do I really want to meet a guy from Disney who builds computers?"

Initially, Hillis was no less sceptical. But the two agreed to meet and soon found they had a lot to talk about. As a systems engineer, Hillis was puzzled by the way oncologists reduce cancer to the action of genes, when it is a disease that affects a whole organism. Agus too found himself looking at cancer in a different way. "The natural inclination of physical scientists is to step back and say, 'Listen, I know I'm not going to understand every component of that system. But it doesn't mean I can't control that system'," he says.

Since last year, their collaboration has been formalised within the new Physical Sciences Oncology Center at USC, one of 12 that the NCI has set up across the US. Agus and Hillis are now working together to create a model of how lymphoma, a cancer of the immune system, grows and spreads in mice. The project showcases the sophisticated technologies physicists and engineers already contribute to cancer research: nanoscale sensors for analysing protein interactions, microfluidic tools for looking at genetic changes in single cells and even microscopic techniques that allow a direct peek at tumours growing inside living organisms.

The real innovation, though, is what Agus, Hillis and around 20 other scientists from disparate disciplines are doing with all the data streaming in from that research. They are testing a set of interlocking computational models they have developed from basic principles to describe and predict different aspects of the disease: from protein interactions and modifications within cells, through a tumour's growth and genetic evolution, to the host's response to the disease and various therapies.

Personalised therapy

Within five years, the team hopes to have a single, all-embracing model of mouse lymphoma that fits the data as convincingly, and has as much predictive power, as a theory of gravity or electric fields. If they can pull that off, transferring the insights to humans will be the next challenge. The dream is to produce a model that, by plugging in key parameters - sex, blood pressure, genetic sequences and the like - could predict an individual's response to various combinations of cancer therapies. "We could run a simulation for each patient, and design a complex treatment specific to that patient," says Hillis. "Maybe we would use some radiation for while, then heat them up, then change the glucose level in their blood."

That would be an extraordinary turnaround for cancer therapy. "The science behind what we do every day as oncologists is almost 50 years old," says Mitchell Gross of the Westside Prostate Cancer Center in Beverly Hills, California, who is also involved in the USC centre. The experiments that form the scientific basis for giving chemotherapy and radiation were done in the mid-1950s, he says, and since then optimisation has been largely about coming up with less toxic and more effective chemicals, or using a different schedule of treatment. "Patients ask me, 'Why are you giving me six doses of this chemotherapy instead of four or eight?'," says Gross. "The reason is, the other thousand patients got six doses of this chemotherapy, so we have to give you the same thing."

Not everybody is convinced by the new approach. Many biologists doubt the human body will give up its mysteries under crude mathematical scrutiny. Such an approach implies a degree of simplification and loss of detail that could never do justice to the complexities of a dynamic and variable system, they argue. "You can come up with computational models, and they may be very interesting, but the question is whether they reflect reality," says Leonard Augenlicht, an oncologist at the Albert Einstein College of Medicine of Yeshiva University in New York.

Paul Davies of Arizona State University in Tempe, a distinguished theoretical physicist and cosmologist recently recruited by the NCI to its new programme, takes a different view. "Every system around us is in practice very complicated," he says. Armed with basic rules of nuclear physics, magnetic fields and heat radiation, for example, we can produce pretty good models of how the sun works, without knowing the details of what every particle inside it is doing. Why should the same not be true for living organisms? Augenlicht counters that whereas stars such as the sun develop according to a well-defined pattern, biological entities evolve in response to their environments in ways that might not seem inherently logical or efficient. "Trying to derive a model of how cells behave, how tumours behave, is very different to working out how the universe behaves," he says.

We can model how a star works. Why should the same not be true for living organisms?

Paul Newton is one researcher taking up the challenge. He cut his teeth in USC's aerospace and mechanical engineering department developing numerical models of hurricanes. As a project leader at the new physical sciences oncology centre at the Scripps Research Institute in La Jolla, California, he is now also applying his modelling expertise to metastasis - the poorly understood and lethal process by which tumour cells break away from their original site and spread via the lymphatic and blood circulatory systems.

Break it down

Newton aims to tackle metastasis as a physicist or engineer would: by breaking it down into simple steps that can each be modelled using equations. "We write down the fundamental equations of fluid mechanics for the

blood flow and for a deformable cell, model what a deformable cell is, model the vessel walls the blood is going through, model the pumping of the heart and the pulsatory fluid motion that's driving the whole system, and then numerically simulate it," he says. "In principle, the equations are all there."

What he needs, and is getting, are the specifics: basic stuff such as how stiff cancer cells are and how far they can stretch and squish without breaking. In his centre in Tempe, similar questions are on Davies's mind. "It's quite clear that cancer cells are physically distinct from healthy, and as they become more and more malignant those changes become more and more pronounced," he says. His team is looking closer at those changes, using the technique of atomic force microscopy to measure the shape and stiffness of cancer cells and how the nanoscale structure of chromosomes changes as the disease progresses.

No one knows how informative this concentration on the mechanical properties of cells rather than its genetics will turn out to be - perhaps not very, says Larry Nagahara, director of the NCI's physical sciences initiative. "But if it is, it will open up a new field."

"Some people definitely feel that the approach is a little abstract, or that we're oversimplifying things to the point where they're irrelevant," says Parag Mallick, a proteomics researcher at the USC centre. Beverly Mitchell, an oncologist at the Stanford Cancer Center in California, welcomes any fresh approach, but questions the likelihood of quick insights. "It's exciting and new, something we haven't tried before," she says. "But the speed at which this develops into something useful in diagnosing and treating cancers, that's still up in the air."

Those involved stress that it is about learning from each other, not about physicists taking over and showing biologists everything they are doing wrong. "We don't have the knowledge of the biological system," says Hillis, the computer scientist. "There's no way we could do this ourselves."

To Agus the oncologist, meanwhile, that knowledge gap might turn out to be an advantage: great insights often come from those unencumbered by intellectual baggage. "Galileo would go out every night and map stars," he says. "After four months he had a beautiful map where he could predict where every star would be. But he didn't even know what a star was."

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http://www.newscientist.com/article/mg20727680.400-crunching-cancer-with-numbers.html

Invisible weapons to fight fake drugs

- Updated 15:58 13 July 2010 by **Paul Marks**
- Magazine issue 2768.

Playing the drug lottery (Image: Issouf Sanogo/AFP/Getty)

Updated: *13 July 2010*

THE perils of counterfeit drugs go way beyond being ripped off by dubious online pill-pushers. Malaria treatments containing no active ingredients, out-of-date chemotherapy drugs and diabetes medication with lethal levels of compounds that encourage insulin release have all recently been found on sale in legitimate outlets. Now the pharmaceutical industry is trying to fight back by making it easier to spot fakes.

The World Health Organization estimates that 50 per cent of all medicines sold online are worthless counterfeits. In developing nations fake pills may account for as much as 30 per cent of all drugs on the market. Even in the developed world, 1 per cent of medicines bought over the counter are fakes.

Some key events illustrate the risk these pose. In Nigeria, 2500 children died in 1995 after receiving fake meningitis vaccines. In Haiti, Bangladesh and Nigeria, around 400 people died in 1998 after being given paracetamol (acetaminophen) that had been prepared with diethylene glycol - a solvent used in wallpaper stripper. The fakers are nothing if not market-aware: in the face of an outbreak of H5N1 bird flu in 2005, they began offering fake Tamiflu.

What can be done? The WHO coordinates an umbrella body called the International Medical Products Anti-Counterfeiting Taskforce (IMPACT), an industry initiative that issues alerts when it finds anomalies in the medicine supply chain. Such events include sudden drops in wholesale prices, hinting at fakes coming onto the market, or the mimicking of anti-counterfeiting features on packaging, such as holograms or barcodes, says Nimo Ahmed, head of intelligence at the UK's Medicine and Healthcare Products Regulatory Agency.

Drug packaging is an obvious avenue for counterfeiters to exploit. Boxes and blister packs are usually easy to copy and the repackaging of drugs is not necessarily illegal. Indeed it is standard practice in the pharmaceutical industry as countries have their own rules on, for example, the quantity of a drug that can be supplied in a pack.

What's really needed, says Dean Hart of NanoGuardian, a nanotechnology firm based in Chicago, Illinois, is a way to authenticate the drugs inside the packs. The company is aiming to do that by printing microscale and nanoscale information on pills and capsules.

The idea is based loosely on technology developed by NanoGuardian's owner, NanoInk, which pioneered a process called Dip Pen Nanolithography. DPN was originally designed to drop biological samples such as individual stem cells into test wells. NanoInk has adapted the technology to create a print head 15 nanometres across at the end of a nanoscale arm steered by an electric field. The tip can incorporate hollows that hold a minuscule volume of a substance to be "printed" onto a surface.

"We are using a lot of what we learned building those nanoscale tools to write on pills, capsules, vial caps and pre-filled syringes," Hart told *New Scientist*.

Nothing is added chemically to a tablet in the process, he stresses. Instead, they use a nano-imprinter whose precise mode of operation is confidential. First, they use their imprinting pen to create a microscale mark - perhaps the drug company's logo - that is visible only using a high-magnification eyeglass, or loupe. "That gives you a very good indication that the drug's authentic," says Hart.

Inside the logo they then imprint a 350-digit nanoscale random number that is changed daily. That number is recorded on the drug-maker's database alongside information on where the batch was made, where it was destined to be sold and the drug's expiry date.

Should investigators find out-of-date drugs on sale, they can send them to NanoGuardian to read the number and trace where that consignment was originally shipped to. The technology has been approved by the US Food and Drug Administration for use on a drug made by Capsugel, a division of pharmaceutical giant Pfizer, which will debut later this year.

NanoGuardian is not alone in trying to apply a benign ID mark to tablets. At Ghent University in Belgium, nanomedical engineer Stefaan De Smedt is developing an edible polymer fibre that can be labelled with a telltale fluorescent barcode along its length and incorporated into a pill (*Advanced Materials*, DOI: 10.1002/adma.201000130).

De Smedt is experimenting with cellulose and polystyrene-based fibres. To make them, he takes a solution of the fibres and adds fluoroscein, a fluorescing agent used in medical tests. The solution is then turned into microfibres using a process called electrospinning, where the solution is squirted from a charged syringe tip onto a rotating wheel on which fibres adhere like sticky tape on a roll.

To write barcode-style stripes into these fibres - perhaps encoding information on the type of drug, its source and expiry date - De Smedt illuminates them with laser light at 488 nanometres, a wavelength which locally bleaches the fluoroscein in the fibres, creating dark stripes. The fibres are then cut by laser into 10-micrometre lengths for dropping into the mixture from which the drug will be made.

"You can easily see the pattern of bleached stripes through a simple microscope," De Smedt says. That makes it particularly suitable for the developing world, he adds.

Another authentication method in development uses gadgets that fire near-infrared light at tablets and which then analyse the reflected spectra to ascertain what they contain. With funding from GlaxoSmithKline, Marta Lopes of the Technical University of Lisbon in Portugal is hoping to use this "spectral unmixing" technique to spot the lack of active ingredients or the presence of harmful ones in an instant (*Analytical Chemistry*, DOI: 10.1021/ac902569e).

All, however, realise they are in an arms race to some extent. Hart reckons they have a good 10 years before fakers can copy them. "Counterfeiters are highly resourced, highly intelligent and have picked apart every security measure that's out there," he says. "But we're confident that nano-encryption is as close to being uncopyable as possible."

Counterfeiters are highly resourced and have picked apart every security measure that's out there

Smedt is not so confident. "The fact is, every type of anticounterfeiting technology gets counterfeited in the end."

http://www.newscientist.com/article/mg20727684.300-invisible-weapons-to-fight-fake-drugs.html

Why Facebook friends are worth keeping

- Updated 13:40 15 July 2010 by **Richard Fisher**
- Magazine issue 2768.

Face-to-face communication, the modern way (Image: Martin Puddy/The Image Bank/Getty)

Interactive: *See a visualisation of the links in your Facebook social network using this app developed by Touchgraph, a company based in New York*

NOTHING personal, but I don't really want to be your online friend. I'm sorry, I'm sure you are very nice. It's not you, it's me: I'm feeling grumpy and a tad antisocial, so perhaps we are all better off.

And that goes for you too, annoying ex-classmate who just "friended" me on Facebook. Get lost, media-type I met at a party; your all-too-frequent status updates are pretentious. Trusted colleague, please stop judging my professionalism by the posts on my wall. And mother, you know I love you, but instead of getting upset, please just stop looking at my late-night pub photos.

It may come as no surprise that I have been having second thoughts about online social networking. Anecdotally at least, cutting the cord may be the healthy way to go. My wife shunned such networks from the start and yet has so far managed to avoid becoming a social pariah (between us, this has had an upside: up until now she has been blissfully unaware that an ex-girlfriend friended me last year). In short, what started out as a fun way to keep up with friends is now stressing me out.

For many of us - 400 million worldwide so far and counting - online networking has become enmeshed in our daily lives. It has transformed our social structures and behaviour. Research tracking our habits on these sites is only just emerging, and its conclusions have come as a surprise to cynics like me. It seems these tools are

altering our influence over others, improving our chances of professional success and even making us happier. Could the benefits of social networking be too good to miss out on?

A decades-old insight from a study of traditional social networks illuminates one of the most important aspects of today's online social networking. In 1973, sociologist Mark Granovetter showed how the loose acquaintances, or "weak ties", in our social network punch far above their weight in their influence over our behaviour and choices (*American Journal of Sociology*, vol 78, p 1360). Granovetter found that a significant percentage of people get their jobs as a result of information provided by a weak tie. Subsequent studies have revealed that weak ties benefit our health and happiness. Granovetter suggested that this is because these friends-of-friends aren't like you, yet they are likely to be similar enough in social outlook and personal interests to have a positive influence.

Today, our number of weak-tie acquaintances has exploded via online social networking. "You couldn't maintain all of those weak ties on your own," says Jennifer Golbeck at the University of Maryland in College Park, who studies our use of social media. "Facebook gives you a way of cataloguing." The result? It's now significantly easier for the school friend you haven't seen in years to feed you a bit of information that changes your behaviour, from a recommendation of a low-cholesterol breakfast cereal to a party invite where you meet the love of your life.

The explosion of weak ties could have profound consequences for our social structures too, says Judith Donath of the Berkman Center for Internet and Society at Harvard University, who studies the various ways we communicate using social media. One thing that limited the size of traditional social groups was the time it took to form reliable and trustworthy ties, she says. Online tools have changed that, helping each of us to build a social "supernet": a network of easily accessible contacts that is bigger than any we have ever been able to manage. "It would be impossible to maintain 500 or 5000 ties without it," she says. "We're already seeing changes." For example, many people now turn to their social networks ahead of sources such as newspapers or television, because their acquaintances provide them with more trusted and relevant news, information or recommendations. However, Donath believes more should be done to maintain privacy and trust in the networking tools.

If these supernets continue to thrive and grow, they could fundamentally change the way we share information about the world and transform our notions of friendship and acquaintance. If so, says Donath, the likes of Facebook, LinkedIn and MySpace might just turn out to be the harbingers of a sea change in our social evolution, in the same way that the arrival of language transformed our ancestors (*Journal of Computer-Mediated Communication*, vol 13, p 231).

The magic number

But are these huge networks really that relevant to us on a personal level? Robin Dunbar, an evolutionary anthropologist at the University of Oxford, wrote the book *How Many Friends Does One Person Need?*. In it, he argues that our primate brains place a cap on the number of genuine social relationships we can actually maintain: roughly 150. We simply don't have the cognitive capacity or time for any more, he says.

Online social networking appears to be "very good for servicing relationships, but not for building them de novo," says Dunbar. He argues that our evolutionary roots mean we still depend heavily on physical and face-to-face contact to be able to develop ties.

Nonetheless, there is evidence that online networking can transform our daily interactions. Jeff Hancock of Cornell University in Ithaca, New York, decided to test what effect sharing personal information online has on your chances of being liked. He asked participants in an experiment to try to encourage other members of the trial to like them via an instant-messaging conversation. Beforehand, some participants were allowed to view the Facebook profiles of the person they were trying to win over. He found that those with Facebook access asked questions to which they already knew the answers or raised things they had in common, and as a result were much more successful at winning people over. He concluded that people who use these sites to keep updated on the lives of their acquaintances are more likely to be liked in subsequent social interactions (*Proceedings of the 2008 ACM Conference on Computer Supported Cooperative Work*, p 413).

People who use these sites are more likely to be liked in subsequent social interactions

Social networking may also have tangible effects on our well-being. In two studies of college students, Nicole Ellison of Michigan State University in East Lansing and colleagues found that the frequency of Facebook use correlates with greater "social capital" - a sociological measure of the value of beneficial relationships. Social capital has previously been linked to increased well-being and self-esteem.

Support and affirmation from the weak ties could be the explanation, says Ellison. "Asking your friends for help or advice is nothing new, but we are seeing a lowering of barriers" among acquaintances, she says. People are readily sharing personal feelings and experiences to a wider group of people than they might once have done (*Journal of Computer-Mediated Communication*, vol 12, p 1143).

Facebook's own researchers found a correlation between subjective well-being and site use when they surveyed 1200 of their members last year and compared their answers with evidence of use, such as their clicks on Facebook-hosted news stories, their number of friends, and wall posts received. The company presented its results at the Human Factors in Computing Systems meeting in Atlanta, Georgia, in April.

Ellison cautions that in both of these studies, the correlation doesn't prove that using Facebook is the cause of happiness. However, Sandy Pentland at the Massachusetts Institute of Technology, who analyses technology-based social interactions, believes it is likely there is a causal link. The ability to broadcast to our social group means we need never feel alone, she says. "The things that befall us are often due to a lack of social support. There's more of a safety net now," he says.

Be more influential

Henry Holtzman, also at MIT, who studies the interface between online social networking and the real world, points out that increased visibility also means our various social spheres - family, work and friends - are merging and so we will have to prepare for new societal norms. "We'll have to learn how to live a more transparent life," he says. "We may have to give up some ability to show very limited glimpses of ourselves to others." I discovered this myself when my *New Scientist* colleagues discovered that I have a peculiar affection for golden retrievers dressed up as subatomic particles (don't ask), and visiting Disneyworld.

Another way that social networking appears to be changing our social structures is through power and influence. In behaviour experiments in the laboratory, Michael Kearns at the University of Pennsylvania in Philadelphia found hints that being better connected can give an individual apparently disproportionate influence. In one experiment with 30 volunteers, he asked people to quickly reach consensus in an online game over a choice between two colours. The participants' only means of communication was the ability to see the colour chosen by some of the other participants. They had a minute to reach consensus, and failure to

agree on a common colour meant losing a prize. The twist was that he offered different financial incentives to each participant so that they would try to persuade the group to pick one or the other colour. But some had an extra advantage: the ability to see more of the participants' chosen colours than others.

Kearns ran many variations of the experiment, and every time he found that the people who could see the choices of more participants (in other words, were better connected) persuaded the group to pick their colour: even when they had to persuade the vast majority to give up their incentive. While Kearns cautions that the setting was artificial, he says it's possible that great influence could lie with well-connected individuals in the real online world too (*Proceedings of the National Academy of Sciences*, vol 106, p 1347).

Hints about the origin of this influence come from a study by Stephanie Tom Tong of Michigan State University, and colleagues, who found that online popularity is related to your number of online friends. They asked Facebook users to rate the "social attractiveness" of the profiles of others, which differed only in the number of visible friends. The researchers found that people with about 300 friends were rated as the most appealing, any more than that and their social attractiveness began to drop off (*Journal of Computer-Mediated Communication*, vol 13, p 531). The average number of Facebook friends is 130, according to the website's owners, which is not too far from Dunbar's hypothesised 150.

In which case, maybe I should be expanding my social network rather than unfriending my weak ties. Want to be friends?

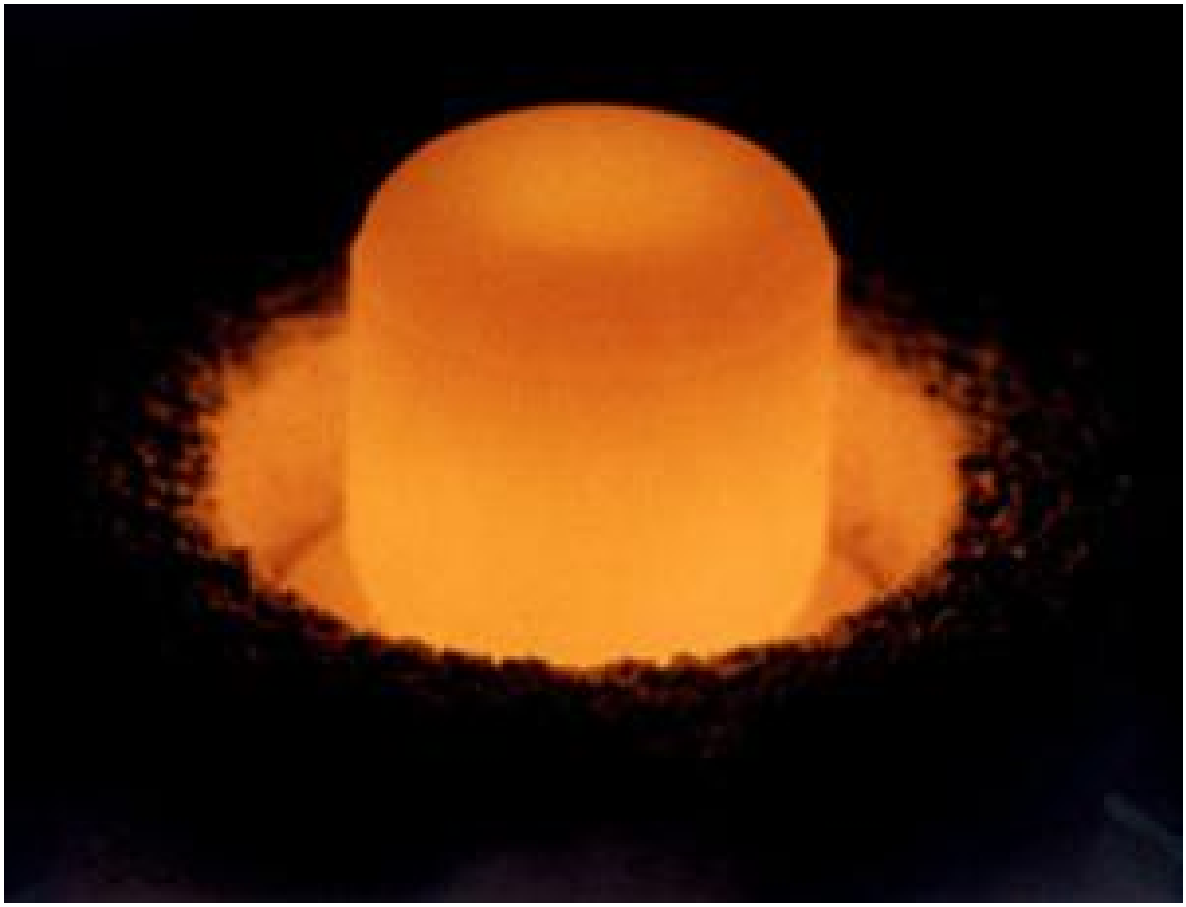
When this article was first posted, the second sentence of paragraph 12 read: "In two studies of college students, Nicole Ellison of Michigan State University in East Lansing and colleagues found that the frequency of Facebook use correlates with greater self-esteem," paragraph 13 was part of paragraph 12 and the first sentence of paragraph 14 read: "Facebook's own researchers found the same correlation between subjective well-being and site use when they surveyed 1200 of their members last year and compared their answers with evidence of use, such as their clicks on Facebook-hosted news stories, their number of friends, and wall posts received."

Richard Fisher is the deputy news editor of New Scientist

http://www.newscientist.com/article/mg20727680.500-why-facebook-friends-are-worth-keeping.html?DCMP=NLC-nletter&nsref=mg20727680.500

Smoke-detector isotope to power space probes

- 17:22 14 July 2010 by **David Shiga**



Not much plutonium-238 left (Image: US Department Of Energy)

What do spacecraft and smoke alarms have in common? A material commonly used to detect smoke on Earth could soon power robotic missions to other planets.

Previous spacecraft travelling to the outer solar system have been powered by the decay of plutonium-238. The isotope is running out, though.

The US stopped producing plutonium-238 in the 1980s and NASA has nearly used up the leftovers from that period. The US Congress has so far baulked at paying the many millions of dollars it would take to restart production.

Russia has some leftover material of its own that it could sell, but it is not yet clear if negotiations with the US will result in a deal.

This could mean that there will not be enough plutonium-238 for a joint NASA and European Space Agency mission to Jupiter and its icy moon, Europa, which is planned for launch around 2020.

Weighty stuff

ESA now plans to build up an alternative supply of americium-241. In smoke detectors, the material's decay helps to make ions that trigger an alarm when smoke particles attach to them.

"We really don't know of any other way to have an electric power supply going into the deep solar system," says David Southwood, ESA's director of science and robotic exploration.

Americium-241 decays more slowly than plutonium-238, potentially allowing for longer missions, says Ralph McNutt of Johns Hopkins University in Baltimore, Maryland, who co-authored a report on the plutonium-238 shortage in the US.

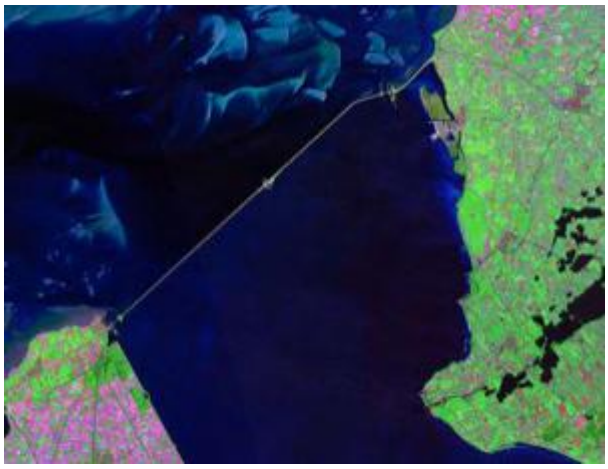
On the downside, it takes more of the stuff to supply one unit of power, which could be a drawback for space missions, in which weight must be kept at a minimum, he says. "When you're trying to do interplanetary missions, really every kilogram counts," he says.

http://www.newscientist.com/article/dn19174-smokedetector-isotope-to-power-space-probes.html

A salty solution for power generation

- 13:28 19 July 2010 by **Helen Knight**

There's electricity in that thar dyke (Image: NASA)



We've already tried to generate power from ocean waves and tides. Now engineers are trying to tap energy from another of the sea's abundant resources: salt.

Efforts to generate power from the salinity difference between seawater and fresh water from rivers and lakes are already well advanced in Europe, where two alternative approaches are being tried out.

Last week Redstack, based in Sneek in the Netherlands, was granted permits to build a pilot salt battery at the Afsluitdijk dyke in the north of the country, fuelled by waters from an inland lake and the North Sea. The plant should initially be able to deliver 5 kilowatts, but the company wants to increase this to 50 kilowatts over the next few years if funding is secured, says director Pieter Hack.

The company already has a small pilot plant operating on waste water from a salt mine in the same area.

Red sea power

Its salt battery is based on a process called reverse electrodialysis (RED) and consists of a stack of membranes. Each one is waterproof but allows either positive or negative ions to pass through, with "positive" and "negative" types alternating in the stack.

Salt and fresh water are pumped into chambers in the stack that are sealed off from one another by the membranes. The positive sodium ions in the seawater flow across one membrane to the fresh water, while the negative chloride ions from the seawater flow across a membrane in the other direction. This process generates a potential difference between titanium electrodes coated in a precious metal placed at either end of the cell.

Redstack calculates that there is enough water available at the Afsluitdijk dyke site to support a 200-megawatt plant.

Pressure drop

Meanwhile power company Statkraft in Lilleaker, Norway, is testing a different approach to osmotic power, known as pressure-retarded osmosis (PRO). Last November the company opened a prototype plant on the

Oslo fjord at Tofte in southern Norway. Here a water-permeable membrane is used to draw fresh water on one side to salty water on the other. This creates a current that drives a turbine.

Whatever the choice of system, there is theoretically enough energy available across the globe in the estuaries where rivers and seas meet to generate more than 2 terawatts of energy, enough to meet all of the world's electricity needs, claims Bert Hamelers, an environmental engineer at Wageningen University in the Netherlands. Better still, osmotic power plants would provide a continuous source of electricity, whatever the weather – unlike wind, wave and solar energy.

But the technology is expensive. Hack has estimated that a 200-megawatt salinity power plant would cost up to $600 million to construct. As a result electricity from the plant would cost around $90 per megawatt-hour – almost twice that of fossil fuel-generated electricity at $50 per megawatt-hour.

So Hamelers and colleagues are developing a new type of salt battery that he claims will be able to generate power from a salinity difference much more cheaply.

Saline solution

In Hamelers's design, seawater is fed into a chamber containing a sandwich of two ion-permeable membranes between two electrodes. Like the RED device, the positive sodium ions are drawn through a membrane that allows only positive ions to pass, and are then attracted to the electrode. The negative chloride ions are drawn through a membrane that only allows anions to pass, and are attracted to another electrode on the opposite side.

Electrons from the now negatively charged chloride electrode then begin flowing to the positively charged sodium electrode, generating a current between the two. Once the seawater electrons are exhausted, fresh water is pumped into the chamber, the sodium ions are drawn back through the membrane to the water, and the electrons begin to flow in the opposite direction. By constantly switching between salty and fresh water in this way, the device generates an alternating current (*Environmental Science and Technology*, DOI: 10.1021/es100852a).

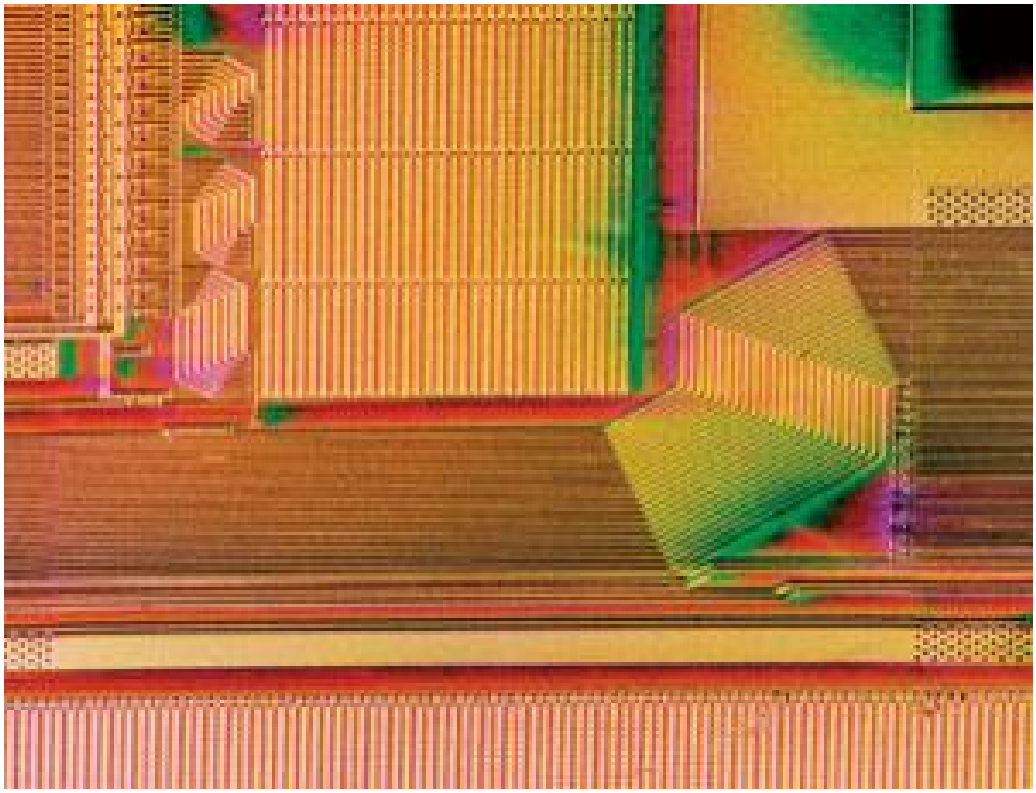
The device should be cheap to produce, as unlike the RED process it needs only inexpensive carbon electrodes, says Hamelers. And unlike the PRO device, it does not need turbines and pressure exchangers to drive the turbine. "You can produce the electrode and membrane materials very easily, because you can produce them on rolls on a large scale, and you can directly use them in a simple set-up to generate electricity," he says.

Hamelers believes the system could be made even simpler, by moving the electrodes between tanks of fresh and salty water, rather than alternately pumping fresh and salty water into a stationary battery.

http://www.newscientist.com/article/dn19191-green-machine-a-salty-solution-for-power-generation.html?full=true&print=true

Silicon chip speed record broken on a lead-coated track

- 16 July 2010 by **Kate McAlpine**
- Magazine issue 2769.



Just add go-faster stripes (Image: David Scharf/SPL)

A "RACETRACK" capable of shuttling electrons around at high speed has set a new record for silicon chips, the cornerstone of computing.

Electrical resistance imposes a strict speed limit on electrons travelling through silicon. To break this limit, computer scientists are considering replacing silicon with carbon, as atom-thick sheets of carbon, or graphene, conduct electricity better than any other substance at room temperature.

Graphene owes this property to an unusual interaction between its hexagonal lattice structure and the electronic structure of its atoms. This effectively brings the mass of its free electrons down to zero. That apparent weightlessness allows them to zip across graphene like photons, reaching speeds of up to 0.003 of the speed of light in a vacuum.

The snag is that graphene is difficult to make in bulk. Now Han Woong Yeom and his team at the Pohang University of Science and Technology in South Korea believe they can mimic its conductivity in silicon. They have clocked electrons travelling 20 times faster than usual in their silicon chips.

Yeom's team added an atom-thick layer of lead to the surface of a silicon block. Because the lead layer is so thin, the arrangement of its atoms is influenced by the silicon atoms underneath. The team suspected that the lead's electrons would, in turn, influence the electronic structure of the silicon at the interface.

To investigate, they fired high-energy photons at the material to knock electrons out of it, and measured their momentum and energy. By subtracting the energy the photons contributed to the displaced electrons, they calculated that some of the electrons at the silicon-lead interface had an apparent mass 1/20th of that of the electrons in typical silicon chips (*Physical Review Letters*, DOI: 10.1103/PhysRevLett.104.246803). "This indicates the possibility of 20-times-faster electrons," says Yeom.

Adding a thin layer of lead to a silicon semiconductor could speed up the chip by 20 times

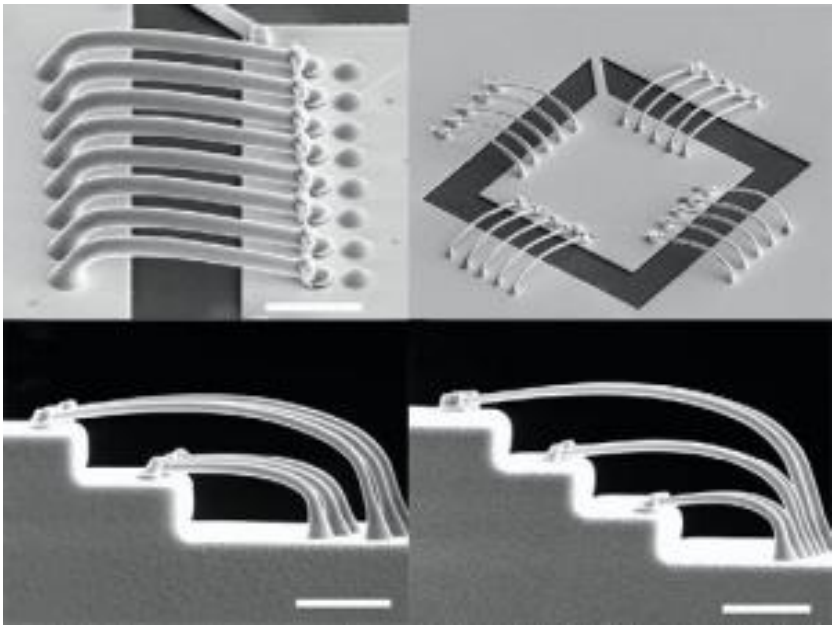
That's still just one-third of the speed of electrons in graphene, but in principle the electron mass can be further reduced - and their speed increased - if different metals are used to coat the silicon, he adds.

"It's fantastic progress," says Zahid Hasan of Princeton University. Speedy silicon could easily outrace graphene to the shelves as the manufacturing infrastructure is already in place, Hasan says.

http://www.newscientist.com/article/mg20727695.800-silicon-chip-speed-record-broken-on-a-leadcoated-track.html

Grow-your-own approach to wiring 3D chips

- 17:50 15 July 2010 by **James Urquhart**



The 3D interconnects links sites at different heights on a 3D chip (Image: Jie Hu/Min-Feng Yu/Science)

When the island of Manhattan became too crowded, architects responded by building skyscrapers. The increasing density of components on "flat" computer chips is encouraging similar ideas, building upwards to create three-dimensional chips. But moving from flat interconnecting wires to 3D ones to link up different "storeys" has proved a tricky business – until now.

Instead of soldering prefabricated wires in place, as is traditionally done to connect two parts of a chip, Min-Feng Yu and Jie Hu at the University of Illinois at Urbana-Champaign have developed a technique to grow tiny 3D wires in situ which are tailor-made for their location.

Yu and Hu's technique is a modified form of electroplating, in which an electric current is used to coat a conductive surface with a thin layer of metal, deposited from a liquid electrolyte. Such a technique theoretically offers a way to directly "write" metal wires onto a surface.

Liquid bridge

But using such electrodeposition to build tiny wires, rather than indiscriminately plating an entire surface, is challenging. One option is to hold the electrolyte in a pipette that's then brought near to the conductive surface. Then, when an electrical potential is applied between the two, a thin "liquid bridge" is established. Copper or platinum particles in the electrolyte are attracted to the surface, creating a small metallic blob.

Yu and Hu realised that because the metallic blob continues to grow away from the surface and along the liquid bridge as long as the electrical potential is applied, the method offers a way to grow 3D wires that extend above the surface instead of just "two-dimensional" ones that run along it.

The trick is to carefully synchronise the speed with which the micropipette is withdrawn from the surface so that it matches the growth rate of the metal blob. When done correctly, the micropipette leaves a solid, 3D metallic structure in its wake. By moving the pipette parallel to the surface, instead of just vertically away from it, it is possible to create intricate 3D structures (see image). Such metallic bridges could link different parts of a conductive surface, or link two conductive surfaces or components at different heights on a 3D chip.

With a small enough pipette, the researchers have grown freestanding interconnects more than 80 micrometres long but just 100 nanometres wide. "That's one order of magnitude smaller in diameter than is possible in current practice," says Yu.

Take the heat

These interconnects can withstand current densities a million times higher than those that will burn out a traditionally soldered interconnect, because the electrodeposited metal forms a much stronger bond with the surface than a soldered joint.

The work provides an "elegant solution" to the problem of growing intricately shaped 3D wires in chip manufacture, says Peter Searson of Johns Hopkins University in Baltimore, Maryland. "It is likely to be an important new tool for the fabrication of three dimensional architectures at the micron scale."

Yu and Hu now hope to shrink the diameter of their wires by yet another order of magnitude, while also scaling up the technique to create a quick, industrially compatible process. "Instead of fabricating wires one by one, we will try to find a way to fabricate them in an array fashion," says Yu.

Journal reference: *Science*, DOI: 10.1126/science.1190496

http://www.newscientist.com/article/dn19181-growyourown-approach-to-wiring-3d-chips.html

Clouds add depth to computer landscapes

- 19 June 2010
- Magazine issue 2765.

Hidden depths (Image: Matthew Taylor/Millennium)

CLOUDS are not normally a boon for image-processing algorithms because their shadows can distort objects in a scene, making them difficult for software to recognise.

However, Nathan Jacobs and colleagues at Washington University in St Louis, Missouri, are making shadows work for them, helping them to create a depth map of a scene from a single camera.

The shadows clouds cast create a depth map of a scene from one camera, a notoriously difficult task

Depth maps record the geography of a 3D landscape and represent it in 2D for surveillance and atmospheric monitoring. They are usually created using lasers, because adjacent pixels in camera images do not equate to adjacent geographic points: one pixel might form the line of a hill in the near distance, while an adjoining one is from a more distant landmark.

Enter the clouds - the shadows they cast can hint at real-world geography, Jacobs's team says. By comparing a series of images and recording the time at which the passing shadows change a pixel's colour they can estimate the distance between each pixel. "If the wind speed is known you can reconstruct the scene with the right scale," says Jacobs. "That is notoriously difficult from a single camera viewpoint."

Compared with laser-created maps, average positional error in the cloud map was just 2 per cent, Jacobs says. The work is to be presented at the Computer Vision and Pattern Recognition conference in San Francisco this week.

http://www.newscientist.com/article/mg20627655.500-clouds-add-depth-to-computer-landscapes.html

Depression makes the world look dull

- 18 July 2010
- Magazine issue 2769.

FOR people with depression the world really does look dull. That's because their ability to perceive contrast is impaired.

To investigate links between mood disorders and vision, Emanuel Bubl at the University of Freiburg, Germany, and colleagues ran an electrode along one eye in each of 40 people with depression, and 40 people without. The electrodes measured activity in the nerves connecting photoreceptors - which detect different aspects of light - to the optic nerve, but not the brain.

Participants sat in a dimly lit room and watched a black and white chequered screen which became greyer in six distinct stages, reducing the contrast between each square. Each stage was presented for 10 seconds, and the experiment was repeated over an hour.

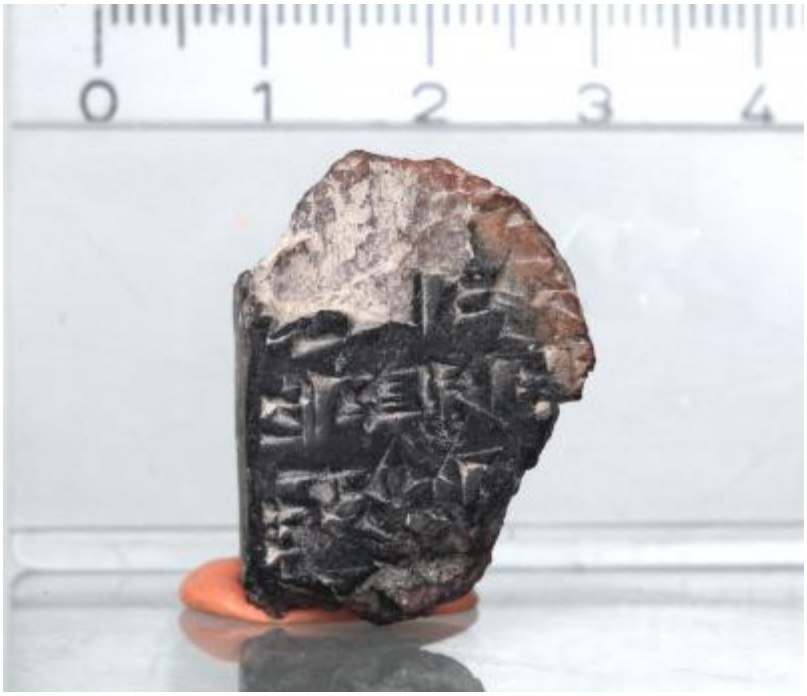
The team found that electrical signals to the optic nerve were lower in people with depression. For example, when viewing the stage containing black and white squares, healthy volunteers had three times the nerve activity of those with depression, indicating that depression diminishes the ability to detect contrast. The more severe a person's depression, the worse their perception of contrast (*Biological Psychiatry*, DOI: 10.1016/j.biopsych.2010.02.009).

Mathew Martin-Iverson at the University of Western Australia in Perth says this could be because the neurotransmitters which regulate nerve activity in vision could also be involved in emotion.

Bubl believes that a similar technique could be used to aid diagnosis of clinical depression.

Written in Clay: Archaeologists Unearth Oldest Written Document Ever Found in Jerusalem

Posted: 15 Jul 2010 12:03 PM PDT



Archaeologists digging outside the walls of Jeruselum's Old City have uncovered part of a clay tablet containing cuneiform symbols that dates back to 14th century B.C.E. The tablet measures 2 x 2.8 centimeters and is one centimeter thick.

It is the oldest written document every found in Jerusalem, eclipsing the previous record by some 600 years.

Prof. Wayne Horowitz , a scholar of Assyriology at the Hebrew University Institute of Archaeology who helped decipher the script says:

"The words the symbols form are not significant in themselves, but what is significant is that the script is of a very high level, testifying to the fact that it was written by a highly skilled scribe that in all likelihood prepared tablets for the royal household of the time."

Though far from the earliest known clay tablets the discovery does help illuminate Jerusalem's role as a major city during the Late Bronze Age.

http://feedproxy.google.com/~r/BookPatrol/~3/k2XBbSy27QM/written-in-clay-archaeologists-unearth.html?utm_source=feedburner&utm_medium=email

Soft-headed intellectuals

What the octopus is revealing about the nature of intelligence

By Emily Anthes | July 25, 2010

Perhaps the most unlikely hero to emerge from this summer's World Cup was Paul the octopus, a lightly spotted invertebrate living in an aquatic center in Germany. Paul earned worldwide fame for successfully "predicting" the winner of eight out of eight soccer games, including the final match. Before each game, Paul's keepers would place two food-filled boxes, each of which was decorated with one team's national flag, in the creature's tank. Whichever box Paul ate from first was considered to be his pick. The octopus nailed it all eight times.

Though Paul's success seems mainly to have been luck — evidence for psychic sports forecasting ability in octopuses is, well, somewhat lacking — if you were looking to consult a brainy animal, you could do worse than an octopus. Research is increasingly revealing that there's something sophisticated going on inside the octopus's soft and squishy head. The critters, it seems, are surprisingly smart.Octopuses "make decisions all the time, complicated decisions," says Roger Hanlon, a senior scientist at the Marine Biological Laboratory in Woods Hole. "People don't expect that from a creature related to an oyster."What scientists are discovering about the octopus calls into question many of our assumptions about intelligence. Partly this is because the creatures are so different from the kinds of animals — social vertebrates, especially mammals — that have long been seen as having a monopoly on smarts. Octopuses are members of a class of creatures known as cephalopods, which appeared on the planet even before the first fish, and they are almost as far removed from us primates as another animal can get. And although it has long been theorized that intelligence evolved in social creatures as a way for species that live in groups to navigate the complex social world, the octopus leads a solitary life.That suggests that perhaps the octopus's smarts evolved for a different reason. The soft creatures are a favored prey for many marine species, and unlike, say, clams, they lack protective shells. Many of the octopus's cleverest tricks, then, have nothing to do with navigating the social world and everything to do with avoiding becoming dinner. It's an entirely different kind of intelligence than what's required in the human world. And that's what makes the creatures so fascinating.

"We're smart and the octopus is smart, but octopus intelligence just can't be related to our intelligence," said Jennifer Mather, a psychologist at Canada's University of Lethbridge and expert on cephalopod behavior. The cephalopod's mental skills, she said, suggests that perhaps we have defined intelligence too narrowly.

When scientists say an octopus is smart, then, what do they mean? Here, a guide to some of the capabilities that scientists are investigating.
http://www.boston.com/bostonglobe/ideas/graphics/20100725_octopusGraphic/

Emily Anthes is a freelance science writer. ■

http://www.boston.com/bostonglobe/ideas/articles/2010/07/25/soft_headed_intellectuals/

How prayer prevents drinking

Surprising insights from the social sciences

By Kevin Lewis | July 25, 2010

A recent study supports an interesting approach to curbing alcohol consumption: regular prayer. In surveys, people who reported praying more often also reported less alcohol consumption and fewer alcohol-related problems, and more prayer was associated with less consumption and fewer problems over the next several months. Of course, people who pray a lot may be less prone to drink anyway, so the researchers randomly assigned people to regular prayer or nonprayer tasks and then asked them to report their alcohol consumption after four weeks. Those who were assigned to pray drank significantly less than those who weren't.

Lambert, N. et al., "Invocations and Intoxication: Does Prayer Decrease Alcohol Consumption?" Psychology of Addictive Behaviors (June 2010).

Fame, enemy of your town

The reality show genre has flourished during the past decade, bringing fame and fortune to many people. But along with the good comes the bad. Two economists at Occidental College in Los Angeles analyzed crime rates in Laguna Beach before and after the debut of MTV's popular reality show of the same name, which followed the social lives of some of the town's affluent teenagers. Compared with a similar neighboring beach town (Dana Point), Laguna Beach experienced an increase in nonresidential burglaries, auto thefts, and rapes, ostensibly caused by the town's newfound fame. Residential crime might have increased too but, as the authors speculate, may have been blunted by the prevalence of gated communities.

Chioue, L. & Lopez, M., "The Reality of Reality Television: Does Reality TV Influence Local Crime Rates?" Economics Letters (forthcoming).

Don't go after insurgents too hard
The question of how aggressively to target insurgents has been a central issue in the Afghanistan policy debate, especially during the recent transition from General McChrystal to General Petraeus. Current policy is focused on defense, rather than attack, to avoid civilian casualties, but many, including the troops themselves, have complained. Now, a detailed analysis from a team of civilian researchers and a US Army counterinsurgency expert has come down on the side of restraint. The average counterinsurgency incident generates an additional six violent insurgent incidents during the following six weeks. Revenge appears to be the driving factor, especially given that the insurgent response is locally concentrated.

Condra, L. et al., "The Effect of Civilian Casualties in Afghanistan and Iraq," National Bureau of Economic Research (July 2010).

The unhappy middle school
Unlike 19th-century schools and contemporary private schools, most public school systems have a separate "middle school" for grades 6 through 8 or 7 and 8. Is this good for students? Researchers at Columbia University analyzed achievement data from New York City public schools and found that students who transitioned from an elementary school to a middle school did worse in math and English than students in K-8 schools who didn't transition. Parents and students also reported being less satisfied with middle schools. The authors estimate that the impact of this situation — if it persists past middle school — could be worth thousands of dollars in lifetime earnings, and it appears to be more severe for already low-performing students. It does not appear to be caused by any difference in resources or class size but may have something to do with the effect on young adolescents of bringing so many students together from different elementary schools.

Rockoff, J. & Lockwood, B., "Stuck in the Middle: Impacts of Grade Configuration in Public Schools," Journal of Public Economics (forthcoming).

Sealing off bad memories
For many people, dealing with bad memories can be an ongoing nightmare. Some research, though, suggests that simple acts can help. A new study has even demonstrated that psychological closure is aided by literal enclosure. First, people were asked to write about a regrettable decision or an unfulfilled desire. Next, some were asked to seal their disclosure in an envelope before handing it in, and some were just asked to hand it in. Those who had sealed their disclosure in an envelope felt better afterwards. Likewise, people who read a news story about a baby's tragic death were subsequently able to forget more of the story and get more closure if they placed the story in an envelope.

Li, X. et al., "Sealing the Emotions Genie: The Effects of Physical Enclosure on Psychological Closure," Psychological Science (forthcoming).

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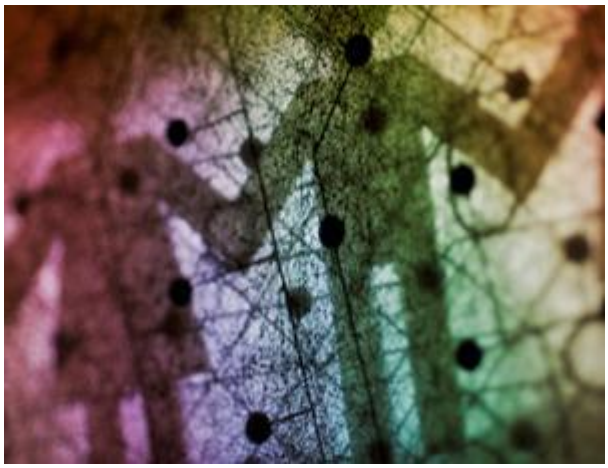
http://www.boston.com/bostonglobe/ideas/articles/2010/07/25/how_prayer_prevents_drinking/

Social networks: The great tipping point test

- 26 July 2010 by Mark Buchanan
- Magazine issue 2770.



A data revolution that can help us understand social connections (Image: Glow Images/Getty)

Your online traces are helping fuel a revolution in the understanding of human behaviour – one that's revealing the mathematical laws of our lives

EVERY move you make, every twitter feed you update, somebody is watching you. You may not think twice about it, but if you use a social networking site, a cellphone or the internet regularly, you are leaving behind a clear digital trail that describes your behaviour, travel patterns, likes and dislikes, divulges who your friends are and reveals your mood and your opinions. In short, it tells the world an awful lot about you.

Now, as any researcher will tell you, good data is gold dust. Its absence leaves theories in the realm of speculation, and worse, poor data can lead you down blind alleys. Physics was the first science to be transformed by accurate information, first with telescopes that revealed the heavens and culminating in massive modern-day experiments like the Large Hadron Collider at CERN, near Geneva, Switzerland. Biology was next, with genome sequencing throwing up so much of the stuff that genetics has turned partly into an information science.

Now the study of human behaviour is heading the same way. Social scientists have long had to rely on crude questionnaires or interviews to gather data to test their theories; methods marred by reporting bias and small survey sizes. For decades, the field has been looked down upon by some as a poor cousin to the hard sciences. The digital age is changing all that - practically overnight, the study of human behaviour and social interactions has switched, from having virtually no hard data to drowning in the stuff. As a result, an entirely different approach to social science has emerged, and studies based on it are appearing with increasing frequency. The impact has been remarkable.

"The data revolution is here for social science," says Albert-László Barabási of Northeastern University in Boston. "For the first time, scientists have a chance to study what humans do in real time and in an objective way. It's going to fundamentally change all fields of science that deal with humans."

The data revolution is here for social science. For the first time we can study what humans do in real time It is becoming possible to tackle fundamental problems previous generations have thought largely untouchable. As with every other data-rich science, Barabási and his ilk ultimately hope to discover mathematical laws that describe human behaviour, and which could be used to predict what people will do.

Sociologists have been hunting for such laws about human interactions and social networks for decades, says Duncan Watts of Yahoo Research in New York, "but the far-reaching implications of their theories have been effectively impossible to test. The measurement technology simply didn't exist". That's changing.

Watts was among the first to realise the potential of the digital trail we leave behind. In 2006, with his colleague Matthew Salganik, now at Princeton University, he designed a web-based experiment to examine how much social influence determines the popularity of music. When a new song goes straight to number 1, it's hard to know if its success has come from the song's inherent appeal, or instead from the herd-like behaviour of many people buying songs they think are already popular. The music industry has had little success in predicting which songs will do well and which won't, suggesting that a lot might be down to chance.

To examine what made some songs more successful than others, Watts and Salganik created a project called Music Lab. It featured a website where more than 14,000 people listened to any of 48 songs by relatively unknown bands, rated them, and downloaded them if they wanted. These options provided a measure of quality (the average rating given) and popularity (the number or downloads). Crucially, the duo were also able to control whether listeners could see how many times other people had downloaded any particular song, or instead had to rely solely on their own judgement. In this way, they could effectively compare outcomes with the power of social influence turned on or off. They also grouped the socially influenced participants into eight independent "worlds" so that they could explore how the outcomes - the popularity rankings of the various tunes, based on downloads - might change if the tape of history could be rewound and run again.

The results strongly support the idea that human influence has a huge effect in making some songs more popular than others. This factor also makes it much harder to predict what will happen, and which songs will do well. The worlds in which social influence was operating had much higher inequality - with popular songs going up and unpopular songs going down to an even greater extent than in the worlds lacking social influence. With social influence turned on, song popularities fluctuated wildly between one world to the next. So, like it or not, it seems like many of us follow the herd.

Watts and Salganik concluded that so-called experts fail to predict successes not because they are incompetent or misinformed, but because social influences multiply chance effects into lasting differences. Accidents determine the song at the top of the chart as much as true quality.

Though quality does count, Salganik points out. The songs rated as the best rarely did poorly, and those rated as the worst rarely did well, but any other result was possible.

These kinds of experiments are making routine the types of experimental studies which were once thought impossible, says Salganik. "With the vast increase in computing power and the almost limitless pool of participants now available via the internet, we can conduct laboratory-style experiments involving thousands, or even millions, of participants," he says.

Indeed, Jukka-Pekka Onnela and Felix Reed-Tsochas at the University of Oxford's Saïd Business School are now using Facebook and its 400-million-plus users as a living laboratory to examine how ideas and behaviours spread through human groups.

Watts and Salganik showed that when it comes to music preference, we behave like sheep. Social scientists have long wondered whether other social transformations - including everything from the popularity of a politician to a change in behaviour to mitigate climate change - arise through independent, individual choice, as many people simultaneously come to similar decisions, or instead through influence, as people copy others' behaviours.

Onnela and Reed-Tsochas realised that analogous changes take place in Facebook, on which people share their profiles with their online friends. Facebook users can also choose to install applications - software components that personalise their Facebook page. If one person adopts an app, their friends are automatically notified, and they can also see the apps their friends are using. Facebook users also have access to a list of popular applications, akin to a best-sellers list.

So far, so high-street bookstore, but there's one huge difference: the data stored on Facebook makes it possible to analyse the growth in popularity of individual applications in unprecedented detail. Onnela and Reed-Tsochas analysed the popularity of several thousand applications in 2007, shortly after those apps were introduced, and then studied how other users adopted them over time. They looked to see if the sequence of adoptions for each app followed an essentially random pattern - indicating that each "adoption event" was independent of other previous adoptions - or whether previous adoptions by a participant's friends influenced the likelihood of their subsequent adoption of an app.

Explosive growth

The results showed that both independent thinking and copying behaviour play a role, reinforcing conclusions reached by conventional survey methods. However, the study also indicated there are two very different processes in action. On the one hand, their analysis shows, at first, when a new app appears it is adopted by users independently of their friends' opinion. But if the popularity of an app crosses a threshold, its very popularity then seems to draw many people to adopt it, and its growth can become explosive. Just as Watts and Salganik found in their Music Lab experiment.

"We found very distinct regimes in which individual or collective behaviour dominates. The change from one to the other is a sharp on/off process," says Reed-Tsochas. They don't yet know whether tipping points of this kind might influence real-world processes beyond the web, such as shifts in political opinions or the popularity of books. "It's certainly possible," says Reed-Tsochas, "but we'll need to wait for equally good data in those areas to find out."

Some say the raw information for analysis of real-world behaviour is already there in the burgeoning online social networks, and have even shown how it can be used to predict social outcomes. For example, one of the most popular techniques for predicting anything from presidential elections to the

box-office success of new movies is by using artificial markets. The Hollywood Stock Exchange (hsx.com) enables movie fans to buy and sell virtual shares in celebrities and in forthcoming or recently released films. This virtual market, which operates with a virtual currency called Hollywood dollars, incorporates the views of millions of people into a stock rating for each film, reflecting the aggregate view on its popularity, or likely popularity. "This is currently the gold standard in the industry for predicting likely box office receipts," says Bernardo Huberman at Hewlett Packard Laboratories in Palo Alto, California.

Huberman and his colleague Sitarum Asur wondered if it might be possible to do even better by exploiting the enormous volume of opinion expressed through social media such as Facebook and Twitter. Opinions voiced in these media, they reasoned, should have strong predictive power because they actually play a role in determining which films do well. "What gets discussed through these media often ends up setting trends," says Huberman.

In an attempt to mine these opinions, they studied the chatter on the microblogging site Twitter. They started from the supposition that movies that get talked about a lot - that generate a lot of buzz - should end up being more popular. To measure the buzz for each film, they looked at the rate at which it generated tweets immediately following its release. They used this as a predictor of the ultimate film sales.

The results show that the rate at which movie tweets were generated can provide accurate predictions of box-office revenue, more accurate even than the Hollywood Stock Exchange. In the end, predicting successful movies may only be of interest to film companies and investors. But Asur and Huberman reckon this is just the beginning, and that their technique should be able to predict social outcomes of many kinds. "When properly tapped, social media express a collective wisdom which can yield an extremely powerful and accurate indicator of future outcomes," says Asur.

Huberman says such analyses could soon help predict many other events, such as election outcomes, or quickly gauge public reactions to major events, just as long as we have evidence reflecting peoples' views on the relevant issue. "Twitter and texting in general were influential in the election of Barack Obama and some businesses are already analysing these kinds of data to assess the likely success of their products," says Huberman.

The ocean of digital information about us isn't limited to opinions. Though it's still controversial, and difficult to get hold of, some teams are accessing much more personal details. For example, Barabási and his colleagues at Northeastern University used cellphone data to analyse human movements - how we move about over hours, days, weeks and months by walking, driving and public transport in all its forms. Detailed data on the scale now available never existed before cellphones became commonplace. Now millions of people carry a de facto tracking device with them all day that automatically logs their every move.

You're so predictable

The dataset the team used covered the movements of about 50,000 people over three months. Surprisingly, the team found that, despite our myriad individual differences and diverse daily routines, the overall statistics of our movements follow a mathematical pattern - and we're far more predictable than you might think. What's more, they found that analysis of past data on movements can be used to predict where an individual will be - to within 1 kilometre of a cellphone tower - even during the more

variable parts of their day, with an accuracy of over 90 per cent (Science, vol 327, p 1018). "We found the same high level of predictability across all users," says Barabási. That's perhaps not so surprising as for most of the day, most of our movements are pretty routine, moving from home to work and back, however, this ability to predict your location holds true even for those people who move around more than just the typical home-work-home commute.

This study builds on earlier work in which Barabási and colleagues used cellphone data to explore the patterns of human movements (Nature, vol 453, p 779). There they found that individuals generally travel lots of relatively small distances, but occasionally take long excursions that move us to very different territory. The precise details of the statistics of such movements follow a mathematical pattern - known as a Levy flight - which turns out to be closely linked to the ways animals such as deer, bumble bees and birds forage for food. Mathematically speaking, our movements turn out to be strikingly like those of other organisms. So we're not so special, at least in this regard.

"There are a lot of details that make us different," says Barabási, who has found convincing evidence that most of our actions are driven by laws, patterns and mechanisms that rival the reproducibility and predictive power of those encountered in the natural sciences.

It's the discovery of underlying patterns of this kind that has excited so many scientists. Given the undeniable complexity of individual human beings, it's not as if social science is going to become like physics, grounded in eternal and general laws, but access to data on human events makes it possible to identify the patterns that do exist and these can be useful for demystifying the social world.

However, as with some developments in physics and biology, the social data explosion also brings with it new risks, says Barabási. "Anyone involved in this kind of research increasingly faces a dilemma - how do we avoid contributing to the creation of a surveillance state?"

Such worries are, perhaps, another sign that social science is finally coming of age. Just as the discovery of nuclear fission raised moral dilemmas for physicists, and genetic modification is now doing for biologists, so the ability to predict human behaviour is presenting new quandaries for social scientists. As ever, with great power, comes great responsibility.

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http://www.newscientist.com/article/mg20727701.100-social-web-the-great-tipping-point-test.html?DCMP=NLC-nletter&nsref=mg20727701.100

All power to the wind – it cuts your electricity bills

- 26 July 2010 by Jérôme Guillet and John Evans
- Magazine issue 2770.

(Image: Larry MacDougal/Rex Features)

Why is wind power derided as subsidised, inefficient and uncompetitive when the opposite is true, ask Jérôme Guillet and John Evans

ATTEMPTS to discredit wind power often claim that wind turbines need to be subsidised. A piece in British newspaper The Daily Telegraph last month asserted that each wind turbine in the UK receives, on average, £138,000 in subsidies a year, and that as a result wind-power investors are coining it hand over fist at the taxpayer's expense.

So are wind farms subsidised? In the sense of direct government support, very rarely. What they do enjoy in most countries, though, is a guaranteed right of access to the grid, and minimum prices for the electricity they produce.

These rights are imposed either directly - by so-called feed-in tariffs - or indirectly via an obligation on electricity producers to generate a certain proportion of their output from renewable sources.

The regime is designed to create an environment favourable to wind power, but it is not funded by the taxpayer. Feed-in tariffs are paid by the companies that transmit electricity, such as National Grid, while producers pay to meet their renewables obligation. In both cases the cost is eventually passed on to consumers. In other words, it is not your taxes that support wind power, but your electricity bill.

This may seem like cold comfort. However, it has an unexpected upside: you end up paying less for electricity when wind power is part of the mix.

You end up paying less for your electricity when wind power is part of the mix

This is because of the way the electricity markets in Europe and North America are set up. They are "marginally priced"; that is, the spot price of electricity is set by the highest price the transmission company must pay at any given time to meet demand.

As an analogy, imagine you need 100 apples. One grower has 60 apples on offer for $1 apiece, another has 30 on offer for $2, and a third has 20 on offer for $3. You buy the entire stock from the first and second growers, and 10 from the third - but must pay $3 for every apple you buy.

The very highest spot electricity prices are seen at moments of peak demand, when coal, nuclear and hydroelectric sources cannot meet the need. At these times extra "peaker" plants need to be turned on. Generally oil or gas-fired, peaker plants have high marginal production costs - generating each extra unit of electricity is relatively expensive because they have to buy oil or natural gas, which are more expensive than coal. Not surprisingly, peaker plants drive the electricity spot price up.

The addition of wind power, however, changes the dynamics of the market. Wind turbines don't burn fuel, so their marginal costs of production are very low - lower even than coal, nuclear and hydro. Being the cheapest, transmission companies buy from them first.

On windless days, wind power companies don't get paid, since they only receive money for the electricity they produce. But on windy days, their output ensures that peak demand is satisfied without the need to turn on the most expensive peaker plants.

In other words, when there is little or no wind, prices on the market are normal; when a lot of wind power is available, it has a moderating effect on prices. The result is that, over time, bills are lower than if wind power were not present, even taking into account the cost of the support regime.

This price-lowering effect is called the merit order effect (MOE), and the resulting savings can be significant. Its impact on prices in European countries with a fair amount of wind generation has been estimated at between €3 and €23 per megawatt-hour. One study by researchers at the Fraunhofer Institute for Systems and Innovation Research in Karlsruhe, Germany, found that it saved German consumers €5 billion a year.

So the MOE is good for consumers - but what about the big picture? We believe that, paradoxically, it spurs opposition to renewables among energy companies, and discourages investment in them.

Imagine you run a utility company with coal-fired or nuclear plants. From your perspective, wind power is causing you to lose out on the windfall cash previously provided by high spot prices at times of peak demand. Will you be inclined to look favourably on plans to increase the share of wind power in total electricity generation?

Insofar as there is a problem, it lies in handing control of industrial policy to marginally priced markets. Market-based decisions are not technology-neutral. They favour short-term profits, and that encourages the building of power stations with low capital costs and high marginal costs. That means gas-fired plants, which are tailored to make a profit whether the spot price is high or low.

In fact, hardly any nuclear or coal-fired plants have been built in the past 15 years, only gas-fired plants, along with renewables installed thanks to support mechanisms such as feed-in tariffs.

If those mechanisms had been ruled to be market-distorting subsidies and removed, leaving the market to make all the calls, we would see nothing but new gas plants built. This would leave us vulnerable, wondering where tomorrow's natural gas, on which we would be utterly dependent, would come from - a scenario that has only been prevented because wind turbines receive support.

It may be that the electricity market will evolve into one that offers long-term fixed prices to producers, as power distributors take into account the long-term stability of the cost of wind power. In that case, wind will need no special favours, since it will be cost-competitive with nuclear and coal. Until that happens, the framework in which wind operates - permitting investment while lowering prices for consumers - is not an abusive subsidy but simply intelligent market regulation.

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John Evans is a writer and an editor at European Tribune

http://www.newscientist.com/article/mg20727704.900-all-power-to-the-wind--it-cuts-your-electricity-bills.html

Our blog vocabulary, our selves

Recent highlights from the Ideas blog

By Christopher Shea | July 25, 2010

A University of Colorado psychologist named Tal Yarkoni has found that blogs reveal more about their authors than they may think. A common theory is that the anonymity of the Internet allows people to concoct idealized personas. (No one knows you're a dog, etc.) But an analysis of the content of nearly 700 blogs found that the content matched rather strikingly the personalities of their authors, as revealed on surveys.

Neurotic personality types used words associated with negative emotions, for instance, while extroverts invoked positive emotions. Bloggers who scored high on the trait of "agreeableness" seldom swore and referred often to the notion of community.

Research Digest Blog reports that Yarkoni even found links between personality type and the use of specific words: "Neuroticism correlated with use of 'irony' and negatively correlated with 'invited'; Extroversion correlated with 'drinks' and negatively correlated with 'computer'; Openness correlated with 'ink'; Agreeableness with 'wonderful' and negatively correlated with 'porn'; and Conscientiousness correlated with

'completed' and negatively correlated with 'boring.' " Yarkoni published his findings in the June issue of the Journal of Research in Personality.

In praise of the epically bad product
Tired of spraying yourself with some ill-odored bug repellent every time you go outside to play with your kids? The SC Johnson brand Off has an answer: the "Clip-on Mosquito Repellent," a bright blue plastic device that attaches to the user's belt. It includes a small fan that helps to maintain a cloud of mosquito repellent around the user.

There are a few problems, however, with this innovative product, according to Consumer Reports. First, it doesn't work. The magazine had to abort one of its tests of the device after only two hours "because all of our testers received multiple bites." (SC Johnson claims 12 hours of effectiveness.)

Second, the active ingredient is metofluthrin, a neurotoxin. The packaging advises that it is important to "avoid breathing vapor." "What vapor?" asks an incredulous host of a video report at consumerreports.org. "The vapor that's being blown out of the fan that's attached to your belt!"

Let us not forget to savor epically bad ideas when they come our way.

1,000,000,000,000,000,000,000,000,000
It's possible to grow up in the East and be unaware of this (trust me), but "hella" is time-honored Northern California slang. It's both an intensifier of adjectives ("This artisanal goat Gouda is hella tasty!") and a general exclamation of delight ("Skiing in Tahoe? Hella!").

Austin Sendek, a physics major at the University of California Davis, wants to take "hella" from the streets and into the lab. With the help of a Facebook-driven public relations campaign, he's petitioning the Consultative Committee on Units, a division of the very serious Bureau International des Poids et Mesures, to anoint "hella" as the official term for a previously unnamed, rather large number: 10 to the 27th power. (The diameter of the universe, by Sendek's reckoning, is 1.4 hellameters.)

The idea came from a physics class, Sendek told the L.A. Times. "I asked my lab partner how many volts were in this electric field, and she said, offhandedly, 'Oh, man — there's hella volts.' It kind of clicked." The name, he says, would honor a region that boasts some of the country's most esteemed science departments.

Sendek's Facebook petition has attracted more than 62,000 supporters, but even he admits his campaign faces long odds, as the international units-arbiters prefer words with Latin roots (mega, giga, and so on). Still, Google engineers caught wind of the campaign and placed a hidden feature in its online units-translator, which allows you to convert large numbers into hella-units. Hella clever!

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http://www.boston.com/bostonglobe/ideas/articles/2010/07/25/our_blog_vocabulary_our_selves/

Becoming a Heroine

Collected Thoughts on the Life and Death of Emma Bovary

"One way of tolerating existence is to lose oneself in literature as in a perpetual orgy," Flaubert wrote in 1858.Consider this passage from Madame Bovary: "You forget everything. The hours slip by. You travel in your chair through centuries you seem to see before you, your thoughts are caught up in the story, dallying with the details or following the course of the plot, you enter into characters, so that it seems as if it were your own heart beating beneath their costumes."

It is not lovelessness or adultery or debt that destroys poor Emma, but this way of living her life as though it were literature. Her dissatisfaction with life emerges because the activities of the daily world don't in any way match the wild ecstasy promised in novels. Emma enters into her first adulterous relationship with the shallow and unworthy Rodolphe and immediately recalls "the heroines of novels she had read, and the lyrical legend of those adulterous women began to sing in her memory with sisterly voices that enchanted her. It was as though she were becoming part of that imaginary world, as though she were making the long dream of her youth come true by placing herself in the category of those amorous women she had envied so much."Emma's transports in Rodolphe's arms are attempts to replicate the transgressive experience of reading novels—forbidden in the convent where she was educated. It's not sexual fulfilment that drives Emma but the idea of becoming the heroine of a romance in her own right.

Long before Emma Bovary was born in Flaubert's imagination, Chaucer's plucky Wife of Bath observed that women in literature influence the attitudes of readers, which is why she tore the pages from her husband's book (an anti-marriage manual cautioning against 'worthless wives').

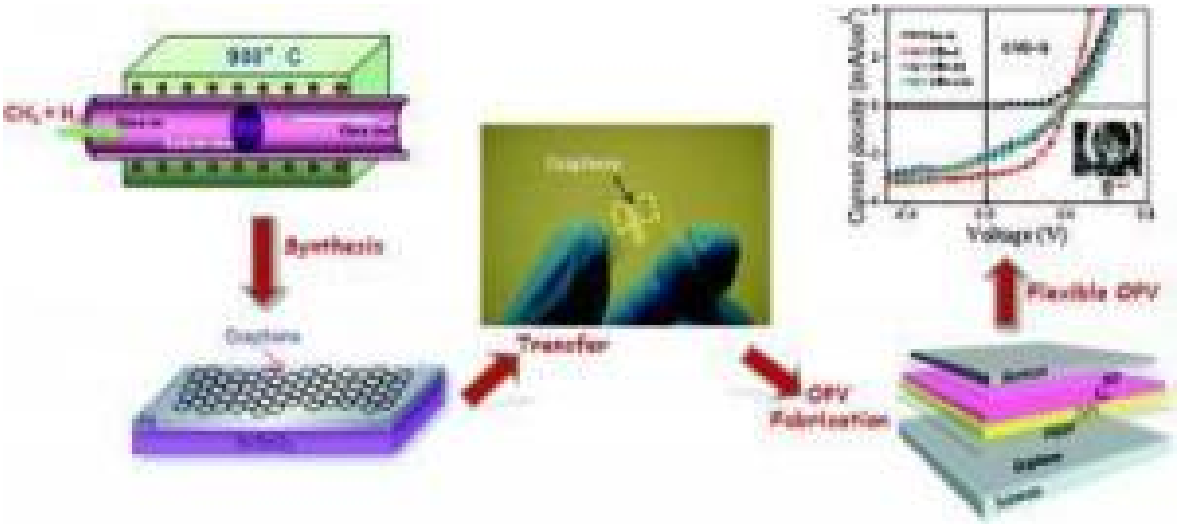
More recently, Erica Jong weighed in: "Emma Bovary is deluded by literature. We identify with her because we too look to fantasy for salvation. If Emma Bovary, with all her self-delusion, still stirs our hearts, it is because she wants something authentic and important: for her life to have meaning, for her life to bring transcendence." "Emma's drama is the gap between illusion and reality, the distance between desire and its fulfilment. On two occasions she is persuaded that adultery can give her the splendid life that her imagination strains toward, and both times she is left feeling 'bitterly disappointed,'" wrote Mario Vargas Llosa.

Edmund Wilson said that what made Flaubert a social critic was his "grim realisation of the futility of dreaming of splendours that can never be achieved. Emma Bovary did not face her situation as it was, and the result was that she was undone by the realities she had tried to ignore."

Henry James asserted that the reality and beauty in which Emma's consciousness and play of mind are invested does not represent this state of romanticism as only her state, but as the state of all people who are romantically determined.For those of us bred on novels (and for a few of us trying to write them), this failing of Emma Bovary is also ours. It's what Flaubert was alluding to when he said, "Madame Bovary, c'est moi."

http://adairjones.wordpress.com/on-reading/essays-about-reading/becoming-a-heroine-collected-thoughts-on-the-life-and-death-of-emma-bovary/

Graphene Organic Photovoltaics: Flexible Material Only a Few Atoms Thick May Offer Cheap Solar Power



A flow of methane and hydrogen gas mixture deposits carbon atoms as graphene on a nickel plate. The graphene later is then transferred to a plastic sheet, which is then incorporated into an organic photo voltaic (OPV) cell. (Credit: USC Viterbi School of Engineering)

ScienceDaily (July 24, 2010) — A University of Southern California team has produced flexible transparent carbon atom films that the researchers say have great potential for a new breed of solar cells.

"Organic photovoltaic (OPV) cells have been proposed as a means to achieve low cost energy due to their ease of manufacture, light weight, and compatibility with flexible substrates," wrote Chongwu Zhou, a professor of electrical engineering in the USC Viterbi School of Engineering, in a paper recently published in the journal ACS Nano.

The technique described in the article describes progress toward a novel OPV cell design that has significant advantages, particularly in the area of physical flexibility.

A critical aspect of any OPV photo-electronic device is a transparent conductive electrode through which light can couple with active materials to create electricity. The new work indicates that graphene, a highly conductive and highly transparent form of carbon made up of atoms-thick sheets of carbon atoms, has high potential to fill this role.

While graphene's existence has been known for decades, it has only been studied extensively since 2004 because of the difficulty of manufacturing it in high quality and in quantity.

The Zhou lab reported the large scale production of graphene films by chemical vapor deposition three years ago. In this process, the USC engineering team creates ultra thin graphene sheets by first depositing carbon atoms in the form of graphene films on a nickel plate from methane gas.

Then they lay down a protective layer of thermo plastic over the graphene layer, and then dissolve the nickel underneath in an acid bath. In the final step they attach the plastic-protected graphene to a very flexible polymer sheet, which can then be incorporated into a OPV cell.

The USC team has produced graphene/polymer sheets ranging in sizes up to 150 square centimeters that in turn can be used to create dense arrays of flexible OPV cells.

These OPV devices convert solar radiation to electricity, but not as efficiently as silicon cells. The power provided by sunlight on a sunny day is about 1000 watts per meter square. "For every 1000 watts of sunlight that hits a one square meter area of the standard silicon solar cell, 14 watts of electricity will be generated," says Lewis Gomez De Arco, a doctoral student and a member of the team that built the graphene OPVs. "Organic solar cells are less efficient; their conversion rate for that same one thousand watts of sunlight in the graphene-based solar cell would be only 1.3 watts."

But what graphene OPVs lack in efficiency, they can potentially more than make for in lower price and, greater physical flexibility. Gomez De Arco thinks that it may eventually be possible to run printing presses laying extensive areas covered with inexpensive solar cells, much like newspaper presses print newspapers.

"They could be hung as curtains in homes or even made into fabric and be worn as power generating clothing. I can imagine people powering their cellular phone or music/video device while jogging in the sun," he said.

The USC researchers say graphene OPVs would be major advance in at least one crucial area over a rival OPV design, one based on Indium-Tin-Oxide (ITO). In the USC team's tests, ITO cells failed at a very small angle of bending, while the graphene-based cells remained operational after repeated bending at much larger stress angles. This would give the graphene solar cells a decided advantage in some uses, including the printed-on-fabric applications proposed by the USC team.

Zhou and the other researchers on the USC team -- which included Yi Zhang, Cody W. Schlenker, Koungmin Ryu, and Mark E. Thompson in addition to Gomez de Arco -- are excited by the potential for this technology.

Their paper concludes that their approach constitutes a significant advance toward the production of transparent conductive electrodes in solar cells. "CVD graphene meets the most important criteria of abundance, low cost, conductivity, stability, electrode/organic film compatibility, and flexibility that are necessary to replace ITO in organic photovoltaics, which may have important implications for future organic optoelectronic devices."

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of Southern California, via EurekAlert!, a service of AAAS.

Journal Reference:

1. Lewis Gomez De Arco, Yi Zhang, Cody W. Schlenker, Koungmin Ryu, Mark E. Thompson, Chongwu Zhou. Continuous, Highly Flexible, and Transparent Graphene Films by Chemical Vapor Deposition for Organic Photovoltaics. ACS Nano, 2010; 4 (5): 2865 DOI: 10.1021/nn901587x

http://www.sciencedaily.com/releases/2010/07/100723095430.htm

Microbicide Containing Engineered Bacteria May Inhibit HIV-1

ScienceDaily (July 24, 2010) — Researchers from the U.S. and abroad used bacteria inherent to the human vaginal tract to develop a live, topical microbicide that may induce production of HIV-1 protein inhibitors and ultimately prevent transmission of the virus. They detail their findings in the July 2010 issue of the journal Antimicrobial Agents and Chemotherapy.

HIV-1 has killed more than 25 million people over three decades and there are currently 33 million people living with the virus worldwide. Although health officials are ultimately striving to develop an effective vaccine, topical anti-HIV-1 microbicides are a promising alternate strategy for minimizing transmission. Live microbicides are of particular interest as they utilize bacteria inherent to the human body to induce natural production of anti-HIV-1 agents.

Lactobacillus spp. are ideal candidates for live microbicide development as they are the predominant bacterial species in the female genital tract. In the study researchers engineered a human vaginal isolate of Lactobacillus jensenii capable of generating the anti-HIV-1 proteins RANTES and CIC5 RANTES which oppose the HIV-1 receptor protein, CCR5. Both RANTES variants inhibited HIV-1 infection and demonstrated significant activity against various HIV-1 genetic subtypes.

"Our results provide proof of principle for the efficient secretion of an anti-HIV-1 active CCR5 antagonist by an engineered vaginal commensal bacterium, which represents an important advancement toward realistic, safe, and low-cost prevention of sexual transmission of HIV-1," say the researchers.

Story Source:

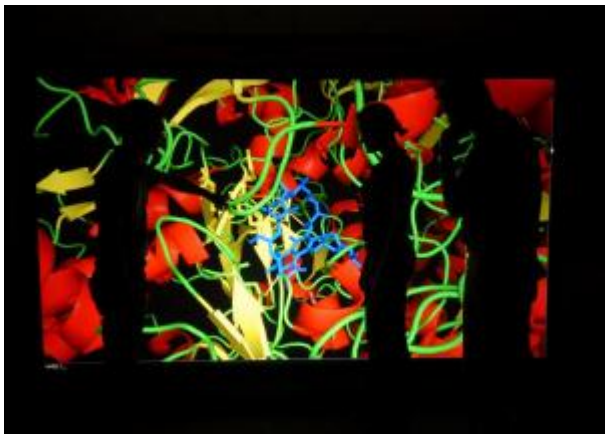
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by American Society for Microbiology, via EurekAlert!, a service of AAAS.

Journal Reference:

1. L. Vangelista, M. Secchi, X. Liu, A. Bachi, L. Jia, Q. Xu, P. Lusso. Engineering of Lactobacillus jensenii To Secrete RANTES and a CCR5 Antagonist Analogue as Live HIV-1 Blockers. Antimicrobial Agents and Chemotherapy, 2010; 54 (7): 2994 DOI: 10.1128/AAC.01492-09

http://www.sciencedaily.com/releases/2010/07/100721153305.htm

Virtual Reality Gives Insight on Protein Structures



Virtual reality allows researchers to simulate modifications to proteins and determine possible outcomes. (Credit: Image courtesy of University of Arkansas, Fayetteville)

ScienceDaily (July 24, 2010) — To understand a protein, it helps to get inside of it, and a University of Arkansas professor has figured out a way to do so.

James F. Hinton, University Professor of chemistry and biochemistry, has worked with Virtalis, an advanced visualization company, to create a computer software program and projection system that lets a person look at larger-than-life, 3-D structures of proteins in virtual reality. This allows scientists to walk inside, through or around the protein of interest for investigating its structure and function.

"Proteins are very complex molecular structures," said Hinton. Proteins are built from amino acids, molecules that share certain characteristics and have unique side chains. Yeast proteins can have 466 amino acids, while the larger proteins have almost 27,000 amino acids. These amino acids interact to form a particular structure for each protein, and this structure helps to determine the function of the protein.

Since proteins underlie most human diseases, they interest researchers studying the underlying mechanisms of disease. The flu virus, for instance, harbors proteins that cause the illness experienced by humans. The bacterium Staphylococcus aureus produces a toxic protein that causes many of the symptoms experienced by the body. Figuring out how to neutralize these proteins could help treat or prevent disease.

Scientists find that examining protein interactions in two dimensions ranges from tedious to impossible because of the proteins' size and complexity. Hinton worked with the advanced visualization company Virtalis to develop the ActiveMove Virtual Reality system for PyMOL, a three-dimensional molecular viewing program. The Virtalis system allows researchers to enlarge the protein to room-size and examine it from all sides, including the inside, which can be crucial for understanding the relationship between structure and function.

"Using this system, we can answer many questions about interactions. Why does a toxic protein do what it does? Does the protein form a channel? If it does, what does it look like? And how can we block it?" Hinton said. "This system can act as a guide for what to do next."

Many proteins, such as a mushroom-shaped toxin from Staphylococcus aureus, form channels to perform their functions and carry out their interactions through binding to other proteins. By virtually exploring the proteins, scientists can determine what kinds of interactions might block the toxic functions of such a protein, or make virtual modifications to the proteins themselves to see if the modifications render them unable to interact and bind to other proteins.

"Thanks to the National Institutes of Health, which has funded the University's Center for Protein Structure and Function for many years, we have superb instrumentation," Hinton said. "The immersive Virtual Reality System provides us with another way of enhancing the data we get from those instruments."

The ActiveMove system includes a 3-D projector with a rear projections screen, coupled with a personal computer, eyewear, head and hand tracking and Virtalis software and support. Funds from the Arkansas Biosciences Institute were used to purchase the Virtalis Virtual Reality System.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by University of Arkansas, Fayetteville.

http://www.sciencedaily.com/releases/2010/07/100722160114.htm

Asia's Most Devastating Droughts Reconstructed

Tree ring scientists Ed Cook (left) and Paul Krusic trekked for nearly two weeks to reach this 1,000 year old hemlock in the Himalayas of Nepal. (Credit: Brendan Buckley)

ScienceDaily (July 24, 2010) — The seasonal monsoon rains in Asia feed nearly half the world's population, and when the rains fail to come, people can go hungry, or worse. A new study of tree rings provides the most detailed record yet of at least four epic droughts that have shaken Asia over the last thousand years, from one that may have helped bring down China's Ming Dynasty in 1644, to another that caused tens of millions of people to starve to death in the late 1870s. The study, published this week in the journal Science, is expected not only to help historians understand how environment has affected the past, but to aid scientists trying to understand the potential for large-scale disruptions of weather in the face of changing climate.

By sampling the wood of thousands of ancient trees across Asia, scientists at Columbia University's Lamont-Doherty Earth Observatory assembled an atlas of past droughts, gauging their relative severity across vast expanses of time and space. "Global climate models fail to accurately simulate the Asian monsoon, and these limitations have hampered our ability to plan for future, potentially rapid and heretofore unexpected shifts in a warming world," said Edward Cook, head of Lamont's Tree Ring Lab, who led the study. "Reliable instrumental data goes back only until 1950. This reconstruction gives climate modelers an enormous dataset that may produce some deep insights into the causes of Asian monsoon variability." There is some evidence that changes in the monsoon are driven at least in part by cyclical changes in sea-surface temperatures. Some scientists have speculated that warming global temperatures could alter these cycles and possibly make some of them more intense, but at this point there is no consensus on whether or how they might change.

For some tree species, rainfall determines the width of their annual growth rings, and these rings are what the scientists were able to read. The researchers spent more than 15 years traveling across Asia to locate trees old enough to provide long-term records. The hunt took them to more than 300 sites, from Siberia down to Indonesia and northern Australia, as far west as Pakistan and as far east as Japan. The project involved collaborations with numerous national governments, local villages and other university scientists. "It's everything from low-land rain forests to high in the Himalayas," said study coauthor Kevin Anchukaitis, a Lamont tree ring scientist. "You have a tremendous diversity of environment, climate influences and species."

The tree-ring records in the study reveal at least four great droughts that are linked to catastrophic events in history. For starters, the study suggests that climate may have played a powerful role in the 1644 fall of China's Ming dynasty. The tree rings provide additional evidence of a severe drought in China referenced in some historical texts as the worst in five centuries. This study narrows it down to a three-year period, 1638-

1641. The drought was most sharply expressed in northeastern China, near Beijing, and is thought to have influenced peasant rebellions that hastened the demise of the Ming.

Another severe monsoon failure came in 1756-1768, coinciding with the collapse of kingdoms in what are now Vietnam, Myanmar and Thailand. The drought roiled political structures all the way to Siberia, and the tree rings also indicate that western India was severely affected. This drought is not documented in historical records; scientists first identified it in teak rings from Thailand, and later in Vietnamese cypress trees. Some historians have speculated that climate must have played a role for such sweeping political changes to have happened simultaneously; fragmentary accounts suggest that dry periods may have been punctuated with devastating floods. The study appears to provide an explanation for the so-called "strange parallels" that Victor Lieberman, an historian at the University of Michigan, has spent his career studying. "It provides confirmation that there are very strong climate links between monsoon regimes in India, Southeast Asia and southern China," said Lieberman in an interview.

Then, the so-called East India drought hit in 1790-1796. This one appears to have been felt worldwide, spreading civil unrest and socioeconomic turmoil. For instance, in Mexico, water levels at Lake Pátzcuaro fell so much they gave rise to ownership disputes over the land that emerged. In Europe, drought led to crop failures that preceded the French Revolution. Famines hit India.

Perhaps the worst drought, the scientists found, was the Victorian-era "Great Drought" of 1876-1878. The effects were felt across the tropics; by some estimates, resulting famines killed up to 30 million people. According to the tree-ring evidence, the effects were especially acute in India, but extended as far away as China and present-day Indonesia. Colonial-era policies left regional societies ill-equipped to deal with the drought's consequences, as historian Mike Davis details in his book Late Victorian Holocausts. Famine and cholera outbreaks at this time in colonial Vietnam fueled a peasant revolt against the French.

The study follows a related report last month by the Lamont tree-ring team suggesting that dramatic variations in the monsoon may have influenced the collapse of the ancient Khmer civilization at Angkor nearly 600 years ago, in what is now Cambodia. That paper, appearing in the Proceedings of the National Academy of Sciences, showed evidence of a mega-drought in the wider region around Angkor from the 1340s to the 1360s, followed by a more severe but shorter drought from the 1400s to 1420s. The droughts were interspersed with severe flooding, and the kingdom collapsed shortly after. The scientist who led that study, Brendan Buckley, coauthored the present drought atlas.

Scientists aren't exactly sure how factors such as volcanic eruptions, greenhouse gases and variations in solar output combine to drive the many variations in the monsoon over the long term. Over shorter time periods, variations seem to be more closely linked to the El Niño-Southern Oscillation (ENSO), the warming and cooling of the tropical Pacific atmosphere-ocean system. Separate studies suggest that El Niño, the warm phase of ENSO, often coincides with a weak monsoon and droughts; it also seems linked to weather changes in Africa and parts of South America. The deadly 1876-1878 drought coincided with one of the most extreme El Niños of the last 150 years. However, the parallels are not perfect, so other factors may come into play at different times, including changes in snow cover over Asia and cycles of sea-surface temperature in the Indian Ocean. There is intense interest in how El Niño and other phenomena may be affected by a warming climate, and how monsoon extremes may affect the growing populations that depend on the rains. Southern China is currently suffering its worst drought in 80 to 100 years, bringing not only water shortages, but tensions with Southeast Asian nations downstream of its watersheds.

Data from the drought atlas is already providing information on particular regions, say the scientists. Using the Indonesia tree ring records, for example, Lamont scientist and study coauthor Rosanne D'Arrigo has reconstructed stream flow in Java's Citarum river basin, a region that waters much of Indonesia's rice. In a recent study in the journal Climate Dynamics, D'Arrigo found a close link between El Niños and weak monsoon rains or drought in Indonesia over the last 250 years.

The atlas is valuable to monsoon forecasters because the record is long enough and the spatial areas detailed enough that modelers can pick out short-term and long-term patterns, said Bin Wang, a meteorologist and monsoon modeler at the University of Hawaii who was not involved in the study. "It is extremely valuable for validating climate models' simulation and understanding their origins in terms of model physics," he said.

Story Source:

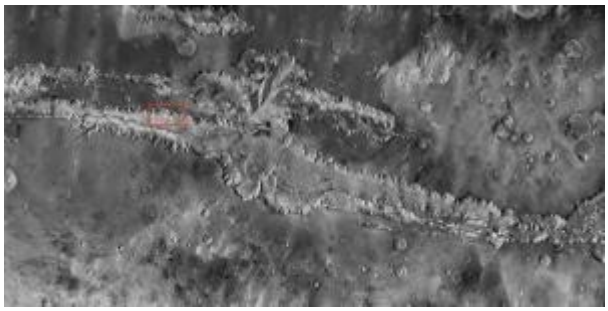
The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by The Earth Institute at Columbia University.

Journal Reference:

1. Edward R. Cook, Kevin J. Anchukaitis, Brendan M. Buckley, Rosanne D. D%u2019Arrigo, Gordon C. Jacoby, and William E. Wright. Asian Monsoon Failure and Megadrought During the Last Millennium. Science, 23 April 2010 328: 486-489 DOI: 10.1126/science.1185188

http://www.sciencedaily.com/releases/2010/04/100422153929.htm

NASA Spacecraft Camera Yields Most Accurate Mars Map



Valles Marineris, the "Grand Canyon of Mars," sprawls wide enough to reach from Los Angeles to nearly New York City, if it were located on Earth. The red outline box shows the location of a second, full-resolution image. (Credit: NASA/JPL/Arizona State University)

ScienceDaily (July 24, 2010) — A camera aboard NASA's Mars Odyssey spacecraft has helped develop the most accurate global Martian map ever. Researchers and the public can access the map via several websites and explore and survey the entire surface of the Red Planet.

The map was constructed using nearly 21,000 images from the Thermal Emission Imaging System, or THEMIS, a multi-band infrared camera on Odyssey. Researchers at Arizona State University's Mars Space Flight Facility in Tempe, in collaboration with NASA's Jet Propulsion Laboratory in Pasadena, Calif., have been compiling the map since THEMIS observations began eight years ago.

The pictures have been smoothed, matched, blended and cartographically controlled to make a giant mosaic. Users can pan around images and zoom into them. At full zoom, the smallest surface details are 100 meters (330 feet) wide. While portions of Mars have been mapped at higher resolution, this map provides the most accurate view so far of the entire planet.

The new map is available at: http://www.mars.asu.edu/maps/?layer=thm_dayir_100m_v11 .

Advanced users with large bandwidth, powerful computers and software capable of handling images in the gigabyte range can download the full-resolution map in sections at:
http://www.mars.asu.edu/data/thm_dir_100m .

"We've tied the images to the cartographic control grid provided by the U.S. Geological Survey, which also modeled the THEMIS camera's optics," said Philip Christensen, principal investigator for THEMIS and director of the Mars Space Flight Facility. "This approach lets us remove all instrument distortion, so features on the ground are correctly located to within a few pixels and provide the best global map of Mars to date."

Working with THEMIS images from the new map, the public can contribute to Mars exploration by aligning the images to within a pixel's accuracy at NASA's "Be a Martian" website, which was developed in cooperation with Microsoft Corp. Users can visit the site at:
http://beamartian.jpl.nasa.gov/maproom#/MapMars .

"The Mars Odyssey THEMIS team has assembled a spectacular product that will be the base map for Mars researchers for many years to come," said Jeffrey Plaut, Odyssey project scientist at JPL. "The map lays the

framework for global studies of properties such as the mineral composition and physical nature of the surface materials."

Other sites build upon the base map. At Mars Image Explorer, which includes images from every Mars orbital mission since the mid-1970s, users can search for images using a map of Mars at: http://themis.asu.edu/maps .

"The broad purpose underlying all these sites is to make Mars exploration easy and engaging for everyone," Christensen said. "We are trying to create a user-friendly interface between the public and NASA's Planetary Data System, which does a terrific job of collecting, validating and archiving data."

Mars Odyssey was launched in April 2001 and reached the Red Planet in October 2001. Science operations began in February 2002. The mission is managed by JPL for NASA's Science Mission Directorate in Washington. Lockheed Martin Space Systems in Denver is the prime contractor for the project and built the spacecraft. NASA's Planetary Data System, sponsored by the Science Mission Directorate, archives and distributes scientific data from the agency's planetary missions, astronomical observations, and laboratory measurements.

For more information about NASA's Odyssey spacecraft, visit: http://mars.jpl.nasa.gov/odyssey .

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by NASA/Jet Propulsion Laboratory.
http://www.sciencedaily.com/releases/2010/07/100723112310.htm

Charging Up Electric Car Batteries in Environmentally-Friendly Way

Customers can enter their requirements via a touchscreen on the charging station. Costs and energy readings can also be displayed during the recharging process. (Credit: Copyright image/ Courtesy Fraunhofer ISE) ScienceDaily (July 24, 2010) — Electromobility makes sense only if car batteries are charged using electricity from renewable energy sources. But the supply of green electricity is not always adequate. An intelligent charging station can help, by adapting the recharging times to suit energy supply and network capacity.

Germany aims to have one million electric vehicles -- powered by energy from renewable sources -on the road by 2020. And, within ten years, the German environment ministry expects "green electricity" to make up 30 percent of all power consumed. Arithmetically speaking, it would be possible to achieve CO_2-neutral electromobility. But, in reality, it is a difficult goal to attain. As more and more solar and wind energy is incorporated in the power grid, the proportion of electricity that cannot be controlled by simply pressing a button is on the increase. In addition, there is a growing risk that the rising number of electric vehicles will trigger extreme surges in demand during rush hour.

"What we need is a smart grid that carries information in addition to power," says Dominik Noeren of the Fraunhofer Institute for Solar Energy Systems ISE. The structure of the grid has to change from a push system based on energy demand to a pull system based on production output. In Noeren's opinion, "electric cars are best equipped to meet this challenge." Introduced in large numbers, they have the capacity to store a lot of energy. On average, a car is parked for at least 20 hours out of 24. That is more than enough time to recharge them when the wind picks up or the demand for electricity is low.

Developed by Fraunhofer researchers, the "smart" charging station is a device that enables electric vehicles to recharge when the system load is low and the share of energy from renewable resources is high. In this way, load peaks can be avoided and the contribution of solar and wind power fully exploited. "For us, it is important that end consumers are completely free to decide when they want to recharge. We do not want them to suffer any disadvantages from the controlled recharging of their vehicles' batteries," Noeren emphasizes. That's why he favors electricity rates that adapt to the prevailing situation in the power grid -- ones that are more expensive in periods of peak demand and particularly cheap when there is a surfeit of renewable energy.

The person using the "smart" charging station could then choose between recharging immediately or opting for a cheaper, possibly longer, recharging time. If they go for the second option, all they need to do is enter the time when their vehicle has to be ready to drive again. The charging station takes care of everything else,

calculating the costs and controlling the recharging process. Via the display the user can track the progress of recharging and also see the costs incurred and the amount of energy used.

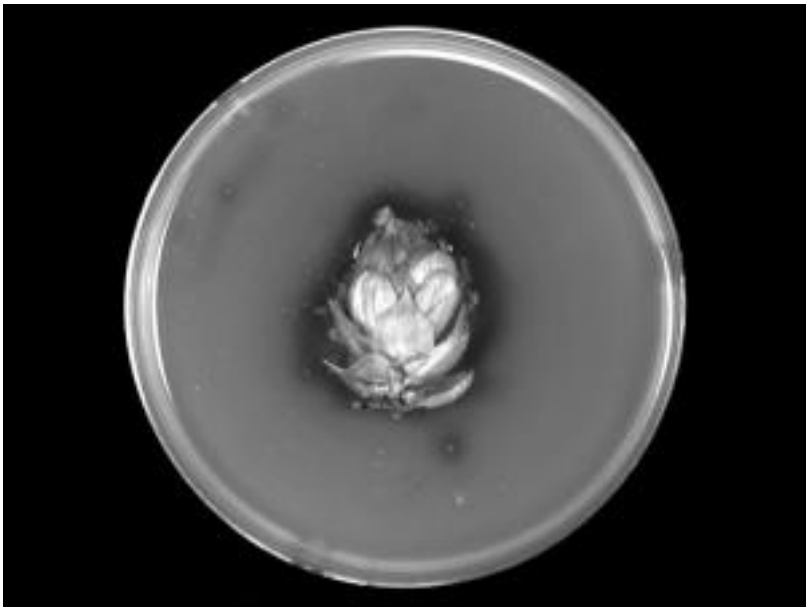
The experts will be presenting their charging device at the Hannover Messe from April 19 through 23.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by Fraunhofer-Gesellschaft, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2010/04/100421111353.htm

Hops Helps Reduce Ammonia Produced by Cattle



ARS microbiologist Michael Flythe has found that feeding hops to cattle can reduce the amount of ammonia they produce by inhibiting hyper-ammonia-producing bacteria (HABs). Here a hops flower is shown inhibiting HAB growth in an agar plate.

ScienceDaily (July 24, 2010) — An Agricultural Research Service (ARS) scientist may have found a way to cut the amount of ammonia produced by cattle. To do it, he's using a key ingredient of the brewer's art: hops.

Cattle, deer, sheep, goats and other ruminant animals depend on a slew of naturally occurring bacteria to aid digestion of grass and other fibrous plants in the first of their four stomach chambers, known as the rumen.

The problem, according to ARS microbiologist Michael Flythe, comes from one group of bacteria, known as hyper-ammonia-producing bacteria, or HABs. While other bacteria are helping their bovine hosts convert plant fibers to cud, HABs are breaking down amino acids, a chemical process that produces ammonia and robs the animals of the amino acids they need to build muscle tissue, according to Flythe, who works at the ARS Forage Animal Production Research Unit (FAPRU) in Lexington, Ky.

To make up for lost amino acids, cattle growers have to add expensive and inefficient high-protein supplements to their animals' feed.

According to Flythe, hops can reduce HAB populations. Hops, a natural preservative, were originally added to beer to limit bacterial growth.

Flythe put either dried hops flowers or hops extracts in either cultures of pure HAB or a bacterial mix collected from a live cow's rumen. Both the hops flowers and the extracts inhibited HAB growth and ammonia production.

Flythe and FAPRU plant physiologist Isabelle Kagan have completed a similar project with more typical forage. They recently identified a compound in red clover that inhibits HAB. Results of that study were published recently in Current Microbiology.

Flythe also collaborated with FAPRU animal scientist Glen Aiken on a study in which hops had a positive effect on the rumen's volatile fatty acid ratios, which are important to ruminant nutrition.

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by USDA/Agricultural Research Service. The original article was written by Chris Guy.

Journal Reference:

1. Michael Flythe, Isabelle Kagan. Antimicrobial Effect of Red Clover (Trifolium pratense) Phenolic Extract on the Ruminal Hyper Ammonia-Producing Bacterium, Clostridium sticklandii. Current Microbiology, 2010; DOI: 10.1007/s00284-010-9586-5

http://www.sciencedaily.com/releases/2010/04/100420152837.htm

Academic Language Impedes Students' Ability to Learn Science, Expert Argues

ScienceDaily (July 24, 2010) — With a little guidance, educators can help students learn to read and understand the complex language of science texts, according to Catherine E. Snow of Harvard University and the SERP Institute.

Middle and high school students who read fluently in English class and on the Web may find that they cannot understand their science texts. And their science teachers may be ill prepared to guide them in reading the academic language in which science information is presented. In "Academic Language and the Challenge of Reading for Learning About Science," an article to be published in Science on April 23, 2010, Catherine E. Snow, a professor at the Harvard University Graduate School of Education and the Boston research director for the Strategic Education Research Partnership (SERP), makes the case that students need to be taught academic language in order to learn science and other subjects.Word Generation, a SERP program developed under Snow's leadership, presents middle school students with all-purpose academic words embedded in interesting topics and provides materials for teachers of science, mathematics, and social studies to extend the academic language focus across the curriculum and throughout the week. "The goal is for students to be able to read academic material on their own, but many will need some help through programs like Word Generation to get to that point," said Snow.

In addition to having its own specialized vocabulary, academic language is more concise, using complex grammatical structures to express complicated ideas in as few words as possible. This is especially true when it comes to scientific writing. Students who prefer reading Web content over books have fewer opportunities to learn this language on their own.Snow is helping teachers solve everyday learning problems that occur in classrooms thanks to a unique collaboration between the nation's top research and development talent and education professionals created by the SERP Institute. "By recruiting highly distinguished scholars like Catherine Snow, SERP has succeeded in making the difficult and often unglamorous work of tackling critical problems of everyday practice a respected endeavor," said Suzanne Donovan, SERP executive director.

The SERP collaboration is thriving at the William B. Rogers Middle School in Boston, which serves as a showcase for other schools in the district and beyond. With Word Generation now firmly embedded in everyday practice, academic language is taught systematically by teachers across the spectrum. "Word Generation is not a program to have kids memorize words and their meanings each week," said Principal Andrew Bott. "It is a program about how to look at words, to consider them in different forms, to access them across content areas, to determine different meanings of words depending on the content area, and to use a more sophisticated vocabulary on their own," he said.The academic language project that resulted in Word Generation was developed in the SERP-Boston field site, and supported by the Carnegie Corporation, William and Flora Hewlett Foundation, and Spencer Foundation. The web site supporting the program was developed with funding from the Leon Lowenstein Foundation, Inc.

For more information and to download the program for free, go to www.serpinstitute.org/wordgeneration

Story Source:

The above story is reprinted (with editorial adaptations by ScienceDaily staff) from materials provided by Strategic Education Research Partnership, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2010/04/100422153758.htm

Street Life as Still Life

By DOROTHY SPEARS

SINCE the mid-1960s, when the plein-air artist Rackstraw Downes began painting New York City's ventilation towers, highway underpasses, demolition sites and dumps, "I've seen some funny things, let me tell you," he said.

One morning he was painting by a newsstand, when "a guy leaves the motor of his car running and hops out to buy his Sunday New York Times," he said. "Then a thief jumps into the guy's car and takes off with it." Another time, two pickpockets spotted a woman walking alone and grabbed her purse.

Sometimes the human theater is less dramatic, if no less absurd. He still recalls a woman's voice overheard as he worked near a phone booth: "But John," she said, "we can't let the apartment dictate the nature of our relationship."

Given the pleasure that Mr. Downes takes in such slices of street life, it's striking that his small-format, multipaneled panoramas, created in Maine, New Jersey and southern Texas as well as New York, rarely include humans. He is a painter of modern, often man-made landscapes, populated, if at all, by small faceless figures or the occasional car. Which may explain why, 15 years into the resurgence of figurative painting — a trend that has championed flesh over the landscape or still life — Mr. Downes, 70, remains known as an "artist's artist" a k a chronically underrated.

But that may be changing. Mr. Downes's work is on view in his first-ever retrospective, "Rackstraw Downes: Onsite Paintings, 1972-2008," at the Parrish Art Museum in Southampton, N.Y.; an exhibition centered around a multipaneled painting and its sketches, "Rackstraw Downes: Under the Westside Highway," at the Aldrich Contemporary Art Museum, in Ridgefield, Conn.; and "Rackstraw Downes: A Selection of Drawings 1980 to 2010" at the Betty Cunningham gallery in Chelsea. The British-born Mr. Downes is being celebrated as a master of the American landscape, a form that is starting to get more respect.

Unlike the masters of the genre's 19th-century heyday, Mr. Downes eschews the grandiose and sentimental. His diminutive, wide-angle paintings home in on landscapes of little interest to sightseers.

"Rackstraw's taken this humble chunk of Texas" and other neglected sites, "and become what Morandi is to the bottle," the painter Chuck Close, an art school classmate of Mr. Downes's, said in an interview, referring to the 20th-century Italian painter Giorgio Morandi.

"Rackstraw teaches us to see," said Klaus Ottmann, the curator at the Parrish who organized Mr. Downes's retrospective. "His paintings are small, but when you get up really close, you see these monumental worlds opening up."

During a recent interview in his sixth-floor studio loft in SoHo, Mr. Downes, who has piercing blue eyes and a wispy whitish-gray ponytail, appeared trim and exceedingly fit. (Not surprising, perhaps, given the rigors of what he often describes as "direct physical engagement" with the places he paints — not to mention his building's barely functioning elevator.)

Dressed for work in a denim shirt, gray jeans and sneakers, Mr. Downes said he typically paints every day, sometimes six hours a day, in two three-hour sessions. He doesn't troll the Internet for images — he doesn't own a computer — and he doesn't use, or own, a camera. He rarely retouches canvases in his studio, relying instead on sketches and his own eyes.

Mr. Downes often sets up his easel in several locations during the making of a single painting. The resulting curved horizons and multiple angles of observation challenge traditions like Albertian three-point perspective. In his meticulous portrayals of oil pump jacks, sewage treatment plants and steel refineries, he coolly — and sometimes humorously — evokes dysfunctional relationships between nature and industry.

He sets out early in the morning with a backpack containing a hammer, cords, metal tent pegs and his lunch, which he said he eats standing "or sitting on a curb." (He has a strategy for minimizing bathroom trips: "No coffee — that's fatal.")

He also carries a box easel with paints and brushes and a wooden case he designed expressly for transporting two wet canvases. "I can't tell you how many times I have gotten into a taxi and gotten wet paint all over the interior," he said, adding that he prefers to take the subway.

In addition to these tools, he said, "I have a compass on my watchband, so I can see where I am, and I always have a weather radio with me." This item is particularly handy in summer, he noted, "because you get sudden rainstorms, which can really wipe you out." The short-range forecasts "can tell you this storm is crossing the George Washington Bridge right now, and it'll be in the Bronx in about 10 minutes." This gives him just enough time to pack up and run for cover.

Given the changing seasons, paintings that might take six months to complete in the studio can sometimes get strung out over the course of several years. "You live like a farmer," he said with a laugh.

Mr. Downes was born in Kent in 1939 and became fascinated by calligraphy and illuminated manuscripts when he was a teenager. In the mid-1950s, when his handwriting was singled out for presentation on television, he said, "that was the beginning of visual art for me."

He eventually left England and entered the Yale School of Art in 1961. Under the tutelage of the abstract painter Al Held — and alongside students like Richard Serra and Brice Marden — Mr. Downes made work that he described as "abstractions out of Mondrian." One afternoon, during a visit to Mr. Downes's studio, Mr. Held delivered a fateful blow. "He became very quiet," Mr. Downes recalled. "Then finally he said, 'I assume you know my work,' " implying that Mr. Downes had been overly influenced by it.

Having attended several lectures by the landscape painter Fairfield Porter over the course of his studies, Mr. Downes began painting landscapes. Using money inherited after his father's death to buy a 1,000-acre farm in Maine, he began to beat his solitary path, which today appears radical for its strict adherence to tradition.

Flying in the face of 1970s minimalism, Mr. Downes's landscapes continued to buck reigning art world trends in the next decades. He exhibited quietly in commercial and university galleries, with occasional sales to major institutions, and was consistently overlooked until last fall, when a MacArthur Fellowship provided a bit of long overdue exposure.

Not that he wants to be noticed; quite the contrary. Mr. Downes said he's turned down repeated interview requests in recent months and even declined an offer by the nonprofit group "Art21" to film him painting on the streets of New York. (He eventually allowed himself to be filmed in Presidio, Tex.) He declined to divulge locations where he's painting, saying that he feared that recognition on the street would result in unwelcome interruptions.

For the odd passer-by who offers historical tidbits about a given site, Mr. Downes will gladly make an exception. After all, the hidden narratives of the sites he paints fascinate him. But for the most part he'd rather focus on a cattle egret perched on a pile of garbage.

What truly excites him about these nondescript wonderlands, where nature encroaches on industry and vice versa, he said, is the sustained meditative state they elicit. Also impressive, he added, is that "there is so often this incredible adaptation on the part of the wildlife."

http://www.nytimes.com/2010/07/25/arts/design/25downes.html?ref=design

Are They Installations With Sound or Graffiti With Music? Yes!

"Christian Marclay: Festival" at the Whitney Museum is aptly titled, since the exhibition, up through Sept. 26, is also a kind of music festival. In the late 1970s, Mr. Marclay, an artist-composer-performer, became one of the first musicians to use a turntable as an instrument, and he is equally known in the art world for music-related collages and videos. Most of his works on display at the Whitney — whether made of found objects, still or moving images, texts, LP's or even clothes — are intended to be used as musical scores in one way or another. And they are being used, often repeatedly, by a rotating roster of performers that includes some of the biggest names in avant-garde music.

Roberta Smith, an art critic for The New York Times who reviewed the exhibition, discussed it online with Nate Chinen, who reviews music for The Times. Here are edited excerpts; the full conversation is at nytimes.com/artsbeat (search "Marclay").

ROBERTA SMITH Nate, I'm already in print on the show, which I liked. I would love your impressions of what you've seen and heard so far, and of how Mr. Marclay fits into the music scene.

NATE CHINEN I was really taken with the show, and not just because of my admiration for so many of the musicians involved. As noted in your review, Mr. Marclay urges a heightened awareness of sound in our environment — of whatever we can characterize, loosely speaking, as "music" — by surrounding us with its signifiers (like objects covered in musical notation, for example, or arranged to inspire improvisation), and by inviting our participation. It creates a sense of permissive play, and it's a great way to transfer an immaterial art to a museum setting.

You mentioned in your review that ego is refreshingly absent from this show's vision of performance art; I'd submit that the big exception is "Playlist," a roughly hourlong installation featuring tracks from across Marclay's recorded career. As a pioneer of turntable-as-instrument, he presents himself here both as "curator" — i.e., D.J. — and "transgressor" — not unlike a graffiti artist. (There's no clear authorial voice to his

musical performances, but he's in there somewhere, in tracks like "Hendrix" and "Jane Birkin & Serge Gainsbourg," as well as fully abstract improvisations.)

The gallery housing "Playlist" is set up like a lounge — comfortable white couches, good speakers in each corner of the room — and it really rewards immersion. Most people don't commit to this; during the hour I spent in there, the average time per visitor was about 30 seconds. But a few were patient or inquisitive enough to stick around, and they seemed to enjoy the experience as much as I did.

SMITH The emphatic volume in this room was great for listening and helpfully discouraged talking, too. And I loved having the playlist posted on the big flat screen on the wall, along with the lapsed-time dealie, just like on YouTube. If something was excruciating, you knew how long you would have to endure.

As for what I called the absence of ego, I should have been clear that I was speaking relatively, with the performance art in other New York museums this season — Marina Abramovic at the Modern, Tino Sehgal at the Guggenheim — vividly in mind. And I meant not only Marclay's ego but ours as well: A lot of participatory art encourages acting out, and I think Marclay makes us see music as bigger than all of us; there's a nice humbling aspect.

Regarding Marclay's sonic output — sometimes I love it, sometimes it's just noise. Of course listening from the "art" side, I often wonder if I'm impressed or left cold because I don't know much about underground or new music.

CHINEN One of the great things about "Festival" is the way it slows you down and focuses your perceptions.

SMITH I know. On "Chalkboard," a dark-gray wall covered with musical staves that visitors can write, draw or compose on, one person wrote: "I will not be cynical. I will not be cynical," repeated over and over. (It was also a play on a piece by John Baldessari two floors down, which repeats the phrase "I will not make any more boring art" ad infinitum.) In many ways I felt the show functioned as a very useful initiation to the various ways and means of experimental music and the way its edges blur with performance art, conceptual art, whatever.

The actual performances, however, did not always live up to this idea.

CHINEN Yeah, I was disappointed by some of them, like a Nicolas Collins performance of "Sixty-Four Bells and a Bow" early in the run. Having previously seen that assemblage — of metal, porcelain, glass and crystal bells and a single violin bow — on a shelf in the next gallery, I anticipated a range of textures. But Collins (who began with the disclaimer that he's not a percussionist) approached the task as a dry methodological inquiry, with a laptop, a sampler and what looked like tiny jumper cables. There were a few interesting overtone combinations that emerged, as he oh so carefully inserted his microphones into the bell cavities as if playing an avant-garde version of "Operation." But the concept wore itself out almost immediately.

On the other hand, on the same day I savored a dynamic, freely improvised solo piano scramble by Rob Schwimmer, in the main gallery. (Well, not quite freely improvised: he was responding to the mess of notation, doodles and commentary on the "Chalkboard."

Then there was "Screen Play," which I saw both in rehearsal and performance, with Marina Rosenfeld and Tristan Shepherd on turntables and Austin Julian on guitar and effects. As you rightly pegged it, "Screen Play" is "a movie that is also a score for its own soundtrack" — but Rosenfeld and her partners seemed uninterested in "reading" the "score" as it coalesced onscreen, preferring to function more like foley artists.

So when there was an image of an alarm clock, someone cued up a ticking noise. When a burger was shown on the grill: sizzle.

And when an eye popped open, in extreme close-up, there was a satisfying "plonk!" Which brings me to a question that arose as I watched "Screen Play." That eye (or a few different versions) shows up repeatedly in the film. Do you think this was a nod to Luis Buñuel and Salvador Dalí? Thinking about Surrealism — particularly with respect to the play of language and image, and the gift of odd juxtapositions — puts Marclay's work in a slightly different light for me. But maybe that's too much of a stretch?

SMITH I don't think you're stretching in any sense. The eye in "Screen Play" is probably a nod to "Un Chien Andalou" among other less obvious stuff. And the Surrealist label certainly fits; most of Marclay's work could be characterized as one long, or short, exquisite corpse after another.

Generally I was expecting a bit more from the performances, partly because, like you, I'd seen Rob Schwimmer improvising from "Chalkboard" on opening night and it was amazing. But I intend to go back for more.

CHINEN And of course the performances are only part of it. Your review talked about Marclay as "a post-Jasper Johns version of a Duchampian-Cageian" — someone who delights most in "a found object or image that has had something done to it" — and nothing resonated with that more, for me, than "The Bell and the Glass," a mixed-media piece from 2003. This is Marclay's riff on two cracked icons of Philadelphia: the Liberty Bell and Duchamp's "The Bride Stripped Bare by Her Bachelors, Even," commonly known as "The Large Glass."

I haven't had the chance to see a proper performance, but even without the music, I was hooked. The two video panels in "The Bell and the Glass," stacked one atop the other, suggest a physical kinship with the original work, and there are other kinships within, like clips of Duchamp speaking about his piece. (I lost a good 10 minutes poring over transcriptions of that speech on nearby music stands; the meter, following his cadence, shifts from 11/8 to 12/8 to 10/8, in the space of three bars.)

So Marclay seems to be engaging with a formative influence here, and that's something that always intrigues me. In a sense, he's treating "The Large Glass" itself as a readymade. In fact, I might have considered returning to the Whitney just for another interaction with "The Bell and the Glass." But I don't even need that pretense: the performance schedule is incentive enough, isn't it?

http://www.nytimes.com/2010/07/24/arts/design/24marclay.html?ref=design

At the Pollock House, Photos of the Painter

By STEVEN McELROY

JACKSON POLLOCK was known for a violent intensity that marked not only his work — some of the most innovative and influential paintings of the Abstract Expressionist movement — but also his turbulent life. Fortunately, on an August morning in 1953, the photographer Tony Vaccaro caught his subject in a good mood.

Most of Mr. Vaccaro's work from that day has never been publicly shown, but it will be displayed beginning Thursday in "Jackson and Lee, August 1953: Photographs by Tony Vaccaro," an exhibition running through Oct. 30 at the Pollock-Krasner House and Study Center in East Hampton. The site, now a National Historic Landmark and museum, is the former home of Pollock and Lee Krasner, his wife and a fellow painter — and the place where the photos were taken.

"He was like a bomb waiting for someone to push a button and then blow up," Mr. Vaccaro said. "You had this feeling in his presence. He was tense, as if he felt he was on a mission."

But when Mr. Vaccaro, on assignment for Look magazine, visited the couple that day, Pollock was in a looser mood.

"As soon as I arrived he put his arm on my shoulder and said, 'How about an espresso?' " Mr. Vaccaro said. "He had a relaxed attitude the whole time."

The Look article, which was to be a feature story about a colony of artists in East Hampton, never ran, and much of Mr. Vaccaro's film was subsequently lost. But when Helen Harrison, the director of the Pollock-Krasner center, recently learned that Mr. Vaccaro still had contact sheets of black-and-white shots he had taken, she suggested the current exhibition as a way of showing some of them to the public.

On Aug. 1, the center will hold an opening reception and gallery talk during which Mr. Vaccaro will discuss that morning he spent with Pollock and Krasner, as well as visits with Willem de Kooning and the other artists who were part of the Look assignment.

The pictures to be shown depict Pollock displaying his work, chatting with friends and just relaxing. "What's nice about them is their intimacy," Ms. Harrison said. "These are not posed portraits; they are just people hanging out."

And, Mr. Vaccaro said, they are simply good photographs. "I had known Jackson for two years, but finally we clicked that day," he said. "I think I have the best pictures he's ever had taken."

"Jackson and Lee, August 1953: Photographs by Tony Vaccaro," July 29 through Oct. 30, Pollock-Krasner House and Study Center, 830 Springs-Fireplace Road, East Hampton. Free with museum admission, $5. Hours: Thursdays to Saturdays, 1 to 5 p.m., through Aug. 31; by appointment only in September and October. (631) 324-4929 or www.pkhouse.org.

http://www.nytimes.com/2010/07/25/nyregion/25spotli.html?ref=design

Silence

When Every Voice Should Count

When people ask me about the writers who have most influenced me, I generally hem and haw, demur, hesitate, smile coyly, decline to name anyone. If they persist, I might say “George Eliot” or “Nathaniel Hawthorne” or name any of the Russians. Usually, I regret this immediately. What we all think of as influences is complex and changes by the minute. Later, I think, “I should have said Flaubert, or Yeats, or Duras or Melville.” I also admire Milan Kundera and Michael Ondaatje and Arundhati Roy. Perhaps I should have mentioned them. Or kept quiet altogether.

But admiration and influence are quite different things. I might want to write like Michael Ondaatje, but all the admiration in the world won’t make that happen. Nor should it. Influence is not imitation or theft or plagiarism. It is, instead, something that is born of admiration, but goes further. It is something that has been absorbed completely, internalised, and then brought out from the inside, appearing in a different form in a new work.

When I think of influence in this way, my answer changes. I have to say that the writer who has most influenced my own writing is Tillie Olsen in her book Silences. I have absorbed her ideas and feel its presence in every one of my sentences. This is because I might easily have been one of the silent ones she writes about.

Olsen broke onto the writing scene in the U.S. all of a sudden at a crucial moment—the dawn of the feminist era. Her writing is too accessible to be solely academic, and too literary and intelligent to be merely popular. In the early 1960s, she was a woman who had raised her children and then, in a fierce struggle against necessity and obligations, found her voice. She describes her own silences in the following manner:

In the twenty years I bore and reared my children, usually [having] to work on a paid job as well, the simplest circumstances for creation did not exist. Nevertheless writing, the hope of it, was “the air I breathed, so long as I shall breathe at all.” In that hope, there was conscious storing, snatched reading, beginnings of writing, and always “the secret rootlets of reconnaissance.”

Silences had a huge impact on feminist thought, theory and action, influencing such writers as Alice Walker, Gloria Naylor, Maxine Hong Kingston, and helping to lay the groundwork for the emergence of a new area of study—that of post-colonialism. As Kingston put it, “Tillie Olsen helps those of us condemned to silence—the poor, racial minorities, women—find our voices.” Academic departments began to question the canon, include more women writers, more African-American, Latin American, Chinese-American writers. We all know the result: exciting new departments dedicated to the study of minority writing. And this was happening the world over, not just in America.

Even though injustices still exist and the battles for 'voice' must be fought constantly, we now have a language to define the problems, to describe the process and to guide us where we want to go. And like all languages, this language is made up of words as well as silences.

Olsen examines the varieties of silences, looking at censorship and political silences, the silences of the marginal, and also absences that are a kind of silence. At the very centre of her argument, she quotes Olive Schreiner:

What has humanity not lost by suppression and subjection? We have a Shakespeare; but what of the Shakespeares we might have had who passed their life . . . with no glimpse of freedom. . . .? What statesmen, what leaders, what creative intelligence have been lost to humanity because there has been no free trade in their powers and gifts?

Olive Schreiner presents this idea in her 1883 book From Man to Man. Virginia Woolf revisits it in A Room of Her Own in 1929. Tillie Olsen discusses it once again in a 1962 lecture entitled "Silences in Literature". It applies as much today in South Africa, in England, and in America as it did in the past. It also applies now in Australia.

A terrible silencing has occurred in the last few years in this country, and continues to occur. The government's policy of mandatory detention for those people who come to Australia seeking refuge is surrounded by many of the varieties of silence that Olsen identifies. The press is discouraged, suppressed, even misled, which means that our knowledge of the situation is incomplete. The centres are far away, hidden, cut off, guarded. There is no possibility for a free exchange of information, for any conversation that might make these desperate people not refugees, but human beings. Human beings with stories. Human beings with a past, a present and hopes for a better future. Just like us.

Such a policy of detention means that, for those seeking refuge, not only is the past questioned, not only is a peaceful future threatened, but the present is also quite cruelly denied. Because, while they wait for the validation of their cases—their stories—they are denied words. TV, radio, letters in and out—none of these are allowed. Words are not allowed. Which means that asylum seekers are not only denied freedom, but they are also condemned to silence. Six months, ten months might pass until the first interview; four, five, six months more might creep by until a favourable judgement; several more until the official letter of approval finally arrives. Words granted, but granted stingily, ungenerously, at a snail's pace.

The government has been quiet about the issue, holding fast to a cruel platform, promoting fear of outsiders, suggesting that refugees will drain our social resources, that they might in fact be criminals or even terrorists. And while every country has a right to safeguard its borders, there should be humane laws around just what that means. In a letter written to Amanda Vanstone on June 10, 2004, Tom Keneally asked that "other more genuinely liberal democratic means be sought to protect our sovereignty, without sacrificing the beliefs in human dignity which . . .we share as citizens". Those, like Keneally, who are speaking out are doing so rationally, not radically. They are making a simple call for humanity and social justice.

The press too has been unusually reticent. While attention has been lately given to individual cases, as well as to the recent progress in the government's position regarding the detention of children, the general policy continues without much comment. This injustice is happening here, right where we live. Our silence makes us complicit.

Asylum seekers have come to our country from desperate circumstances. They leave everything behind, risking imprisonment and death. They give thousands of dollars to people smugglers and journey in rickety boats across unpredictable seas. Seeking asylum. All of this takes courage. Yet when they arrive, their desperation and their will and their courage are ignored. They are looked upon with suspicion. They are isolated from Australian society and from communication and from hope in centres that are really prisons. They are condemned to silence. Eventually they lose hope.

And then they sew their lips together. What more symbolic way to protest the silence they are forced to undergo?

Sydney PEN has broken the silence. They've published Another Country, a slim volume that collects the work of over twenty asylum seekers, giving refugees a voice and the chance to tell their own stories of flight and detention. Of the writers included, many have come here precisely because they could not accept the silence imposed on them by their native countries. Distinguished poets and fiction writers, who have fled the censorship and political silencing of tyrannical regimes, land on our shores only to find a similar tyranny. Others—not professional writers—have been 'called' to write out of the difficulties of detention, and in—as stated in Rosie Scott's introduction—"an urgent attempt to reach the outside world and to express their suffering and pain".

Another Country shows just how eloquent many of these asylum seekers are and what—if we let them—they might offer to Australia. One might be a Shakespeare, another a great statesman, or a leader or a creative intelligence. But their gifts will be lost if we don't dispel the silence and allow them a voice.

In the 1960s and 1970s, Tillie Olsen framed her argument around women and literature. It mobilised academic women at a crucial moment and contributed to powerful changes in the academy and how we think of the literary canon. Minorities borrowed her argument and set it in other contexts, changing our view of their experiences. Should we expect anything less than similar positive changes if we break the silences around asylum seekers and this unfair policy of mandatory detention? We have nothing to lose. And just think what we might gain. A reputation for being a society that values social justice and humanity. Gratitude from people who have turned to us for help. The talents of people who have already shown much courage and fortitude. Perhaps even a Shakespeare.

In a democracy, we should feel free to challenge the government and the press and each other. In a democracy, every voice should count. Asylum seekers should be allowed theirs, and we should listen. By Adair Jones.

Article first published in Arts Hub in 2005.

(A 25th Anniversary Edition of Silences was published in 2003 by the Feminist Press, New York. For information about the Sydney PEN centre, visit: www.pen.org.au

http://adairjones.wordpress.com/on-reading/essays-about-reading/silence/

Riffs on Photography (I Am Not Always a Camera)

By KEN JOHNSON

Several overworked trends in photography have been gathered together in "Perspectives 2010" at the International Center of Photography. The first in what will be an annual show, this five-person exhibition includes pictures of old medical specimens, diaristic images by a professional skateboarder, riffs on truth and fiction in generic commercial photography, a video installation about Vietnam and a sculptural assemblage by an artist who is not a photographer at all.

Organized by Brian Wallis, the center's chief curator, the show is designed to focus not only on technical developments in the medium, including film and video, but also on "the subjects of photography and its means of defining and describing critical social, political, or even philosophical issues," as a museum news release explains. Such a series is a good idea, exciting things are happening in photography. But the inaugural foray represents more of the tried and true than the bold and new.

In the genre of documenting significant objects and displays in museums, made familiar by artists like Hiroshi Sugimoto, Thomas Struth and Louise Lawler, Lena Herzog presents a series of black-and-white photographs mostly of conjoined human fetuses in glass jars. These once were popular in medical museums and cabinet-of-wonders institutions in which objects were presented purely for their rarity or freakishness.

Ms. Herzog's photographs, shot up close, are softly focused, which makes the beings inside appear ghostly or extraterrestrial. The photographs are dreamy, but making these unfortunate homunculi appear romantically ethereal is too obvious an approach.

Working in the down and dirty, adolescent style popularized by Larry Clark, Nan Goldin and Dash Snow, the professional skateboarder Ed Templeton presents 139 photographs, in color and in black and white. Neatly framed and arranged in cloud formation, they create the impression of a high-end scrapbook.

As usual with this style, the pictures express bohemian defiance and bittersweet affection for the young and reckless and the old and wounded. Images of young people naked or half-dressed are sprinkled throughout, along with pictures of different sorts of bodily injuries: a youth's bloody hand, a grizzled older man's facial abrasions. Despite the human interest and frequent voyeuristic appeal, Mr. Templeton's pictures of the semi-wild side feel dated and derivative.

Equally unoriginal are Matthew Porter's efforts in the mock-commercial genre made familiar by artists like Richard Prince and Roe Ethridge. Printed and framed to suave perfection, they include images of a mounted

cowboy silhouetted against the sun and a view of a pointy rocky mountain with the tiny, faraway figure of a horse and rider near the base of a cliff. Though evidently not lifted from cigarette or beer ads, they play on the mythic Old West without shedding much more light on the subject.

In a red-tinted photograph in a red frame of the musician Jon Spencer, Mr. Porter toys with the rock-god genre. Pictures of a replica of the zeppelin Hindenburg's cabin and a close-up of a reproduction of its navigation controls — props for a movie, presumably — further serve to "interrogate," as theory-minded people like to put it, the photographic fabrication of history. Will the questioning never end?

While these artists seem to have figured out all too neatly what they're doing, Hong-An Truong struggles with the uncertainties of the multiprojection video installation. For a four-channel work called "Adaptation Fever," Ms. Truong uses film footage from the time when Vietnam was a French colony: grainy, black-and-white images of war and peace before the United States became involved. The power of her installation has almost entirely to do with that source material.

Ms. Truong splits some scenes into mirrored images, and she includes a folk tale translated into English subtitles. At a certain point Simon and Garfunkel's recording of "The Sounds of Silence" plays. A sympathetic interpreter could make a lot of all this, but as presented here — in an insufficiently dark, walk-through space — the general effect is frustratingly vague.

The fifth participant, Carol Bove, is known for sculptures consisting of used books and decorative objects arranged on shelves in ensembles tending to evoke — with knowing retrospection — mythic tendencies in progressive cultures of the 1960s and '70s. It would be interesting to see what Ms. Bove might do with a camera, but alas, this exhibition presents just another example of her sculpture.

Books on the shelf include Freud's account of his patient Dora; a slender catalog of collages by Jess; and a book about the supposedly pre-Columbian, Mesoamerican artifacts known as crystal skulls, which some people regard with mystic awe. There are also reproductions of crazily sexual drawings by the Outsider artist Friedrich Schröder-Sonnenstern, one tacked over a '50s-style Expressionist painting of a nude woman with a bird. Much of this involves mechanical methods of reproduction and printing, but it is a stretch to say that the work as a whole has a lot to do with photography. Perhaps the wall label explains the possibly revolutionary reasoning behind Ms. Bove's inclusion? No, photography is not mentioned. That is annoying.

Judging by this show, Mr. Wallis wants to stake out a wider field for photography as an art form. It does not otherwise tell us much about the future of the medium, which likely will include everything from the traditional print to as yet unheard-of online genres. Maybe next year's installment will offer a more adventurous selection and reveal more of what is to come.

"Perspectives 2010" is on view through Sept. 12 at the International Center of Photography, 1133 Avenue of the Americas, at 43rd Street; (212) 857-0000, icp.org.

http://www.nytimes.com/2010/07/23/arts/design/23perspectives.html?ref=design

Artist and Surfer as Best Buddies

By ROBERTA SMITH

The exuberant three-gallery exhibition “Swell” is one of the Big Kahunas of the season’s group shows. Its requisite summertime theme is surfing, which runs wider and deeper than most, encompassing an array of visual material and several familiar characters, namely the American male as renegade and good buddy.

The show, which sprawls throughout the Chelsea spaces of Nyehaus, the Friedrich Petzel Gallery and Metro Pictures, spans more than half a century, from the 1950s to the present. In addition to scores of artworks it contains about two dozen surf boards, along with photographs, posters and other artifacts. Of the nearly 80 individuals whose efforts are represented here, fewer than 10 are women. This statistic reflects a significant lack of imagination, considering that a lot of the work here is merely vaguely oceanic. Nonetheless the show, which has been organized by Tim Nye of Nyehaus and Jacqueline Miro, an architect, urbanist and surfer, in concert with the staffs at Petzel and Metro Pictures, is ecumenical in other ways.

At the core of “Swell” is an excellent show that helpfully sets postwar Los Angeles art against a broader canvas of surfing, beachcombing and car and drug culture. But the key was surfing, with which art at that time shared both a rebel spirit and certain technologies borrowed from the airplane industry.

It adds both the Beat Generation assemblage of the 1950s and works by lesser-known artists to the more canonical history of the seductive high-gloss Finish Fetish sculptures and reliefs and the environmental “Light and Space” installation pieces that flourished in Los Angeles in the 1960s and ’70s. These last two movements were shown off this year in splendid isolation in “Primary Atmospheres,” a pristine show at Nyehaus and the David Zwirner Gallery; 7 of the 10 artists in that show are represented here, sometimes by the same work.

But “Swell” has more grit, broader margins, more mess. And it evokes more fully the lost innocence of the time before the art world got big and before surfing — the beautiful sport, if not game — became wildly popular and then turned professional. Unfortunately the show often loses its focus as approaches the present, adding recent works by some of the older artists and several more by younger ones — including a few from New York and Europe — that are only tangentially pertinent.

Each gallery’s presentation is different in terms of arrangement, clarity and ratio of older to newer work. A good place to start is Metro Pictures, where the past holds sway, and the historical progression is laid out in distinct segments. In the first space various forms of assemblage dominate, most forthrightly in George Herms’s 1973 “Scientific American,” a large grid of old shelves filled with all manner of detritus, including copies of the magazine for which it is named. It suggests a suite of boxes by a beachcombing Joseph Cornell.

On the opposite wall Ashley Bickerton (a serious surfer who forsook New York — and the Neo-Geo style for which he was known — for Bali in 1993) combines assemblage with his own version of finish fetish. The result is “Jack Blaylock” (2001), a hyper-real portrait of what appears to be an aging, drug-ravaged surfer rendered on a giant piece of gorgeously finished wood that is festooned with bits of driftwood and surf-tossed footwear. The Los Angeles painter Ed Moses offers a palm-treed and beaded folding screen from this year, while works from the 1960s show Tony Berlant using painted tin to more or less obliterate the lines separating collage, assemblage and quilting. Recent works by Fred Tomaselli, a Brooklyn artist who kayaks the waters of the New York region, build images from cut-up magazines, marijuana leaves and pills. Works from the ’60s by Wallace Berman and from the last decade by Robert Dean Stockwell and David Lloyd, another surfer-artist, contribute to the recycling effect, while Ed Ruscha chills everything out with a 1984 field of saffron vapors on which the words “Polynesian Sickness” float.

The overlap of art and surfing is most evident in the style and craft that permeates the second gallery at Metro, where one wall is lined with gleaming surfboards made over the last 50 years. The more austere are the work of well-known surfers who also excelled at the aerodynamic art of board shaping like Herbie Fletcher, Joel Tudor, Matt Kivlin and Donald Takayama.

The gaudier boards have been decorated by artists like Peter Alexander, Raymond Pettibon and Charles Arnoldi, although Jim Ganzer contributes a relatively sinister gray board that resembles a hammerhead shark. A 2004 board decorated by the street artist Barry McGee’s reminds us that surfing spawned a landlocked cousin, skateboarding.

Several Finish Fetish paintings, wall reliefs and sculptures from the 1960s and ’70s attest to the absorption of surf-board materials and techniques — cast fiberglass, resins, high-gloss finishes, and luminous monochromes — by art. Note the fabulous confluence of streamlined forms in various shades of red and egg-yolk yellow by DeWain Valentine, Billy Al Bengston, John McCracken and Craig Kauffman. Especially striking is a yellow surfboard from 2006, shaped by the surfer Mike Hynson with a cherry red fin in translucent resin provided by Mr. Tudor.

Things turn atmospheric in the third space at Metro, where various examples of ’60s-era Light and Space art include the glass boxes of Larry Bell, a wedge of cast polyester by Mr. Alexander, an odd canvas-on-canvas collage by Joe Goode and cast-resin reliefs and sculptures in shades of blue by Helen Pashgian, whose work was largely unknown until recently. She contributes a smoky blue sphere inset with clear polyester resin that conjures up the tube, or interior volume, of a giant wave. Recent photographs by Roe Ethridge and Catherine Opie capture real surfaces in action and on the beach.

In the upstairs space contemporary works by Mary Heilmann, Jay Batlle, Ned Evans, Blake Rayne and Thaddeus Strode harmonize one way or another with earlier pieces by Mr. McCracken, Mr. Goode and Sister Mary Corita.

At Petzel things tilt toward contemporary with appropriately watery or druggy paintings and drawings from the last decade by Bill Komoski, Jeff Lewis, Cameron Martin, Wolfgang Bloch and Robert Longo, and a 2009-10 chunk of black (oil-tinted?) ocean in cast polyester resin by Alex Weinstein. A late-'80s video by Gary Hill provides intermittent surf sounds.

Blasts from the past include an edge-to-edge drawing of waves from 1970 by Vija Celmins; a marvelous "painting" of grafted sticks from 1974 by Mr. Arnoldi that is the ultimate in driftwood elegance; surfing cartoons from the late '60s by Robert Williams, Jim Evans and R. Crumb. A 2001 greenish flourish in painted ceramic by Ken Price, one of the more accomplished artist-surfers, evokes both a hand and a wave represents the Finish Fetish generation, as do a cluster of surfboards by Mr. Fletcher from around 1970. The three largest replicate the shapes boards used by Hawaiian kings: surfing was originally a royal sport. But the boards' red, black and gold militaristic designs reflects the fact that G.I.'s stationed in the Pacific during World War II were among the first Americans to surf.

Mr. Bickerton is represented by a transitional non-Neo-Geo sculpture from 1993: a tall sinuous pedestal of Bali coral with a miniature tent on top. A series of color photographs by Rob Reynolds in the last two years pays tribute to the customized cars of Los Angeles in a dead-pan manner of Mr. Ruscha's 1960s images of things L.A.

At Nyehaus, where the show is ensconced in the gallery's somewhat decrepit town house, funkiness reigns, as does a certain documentary aesthetic. Black-and-white photographs by Bud Browne and Craig Stecyk fully convey the solitude, skill and risk of surfing. One by Mr. Stecyk, from around 1968, shows Miki Dora nonchalantly upright on a speeding board. Mr. Ganzer contributes some equally relaxed photographs of artists like Mr. Bell, Mr. Price and Laddie John Dill, who is represented at Nyehaus by a recent example of the sand and neon installation pieces he has made since the late 1960s. This work shares a darkened gallery with iridescent paintings on velvet from 1975 and 1984 by Mr. Alexander and a decidedly non-fetish-finish wall piece in banged-up aluminum by Mr. Bengston, from 1970-71.

Elsewhere five drawings by Mr. Pettibon iterate the obsession with waves signaled by his wave-covered surfboard at Metro Pictures. Peter Dayton turns the stripes typical of surfboards into a large painting on paper (2008), where they make for a slightly eccentric form of Pop-abstraction. And John Van Hamersveld's 2003 silkscreen of his well-known poster for Bruce Brown's 1966 surfing documentary "The Endless Summer" recalls the moment when the sport truly went global.

This exhibition demonstrates the rich and complicated entwining of art and surfing — two physically demanding disciplines with both fetishistic and mystical aspects. In general it affirms that art is always a reflection of the environment that produces it. In particular, it demonstrates once again that where postwar art is concerned, the East Coast still has much to learn about the West.

"Swell" is at Metro Pictures, 519 West 24th Street, (212) 206-7100, through July 30; and at Friedrich Petzel Gallery, 537 West 22nd Street, (212) 680-9467, and Nyehaus, 358 West 20th Street, (212) 366-4493, through Aug. 6; all in Chelsea.

http://www.nytimes.com/2010/07/23/arts/design/23surfing.html?ref=design