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CONTENTS

Taking Flight
By TONI BENTLEY
APOLLO'S ANGELS
A History of Ballet

By Jennifer Homans
Illustrated. 643 pp. Random House. $35

It has never been done, what Jennifer Homans has done in "Apollo's Angels." She has written the only truly definitive history of the most impossibly fantastic art form, ballet, this most refined, most exquisite art of "aristocratic etiquette," this "science of behavior toward others," as a 17th-century ballet master put it, in which lovely young women perch upon their 10 little toe tips (actually, it is really just the two big toes that alternately support the entire body's weight: think about it) and waft about where the air is thinner — but heaven is closer. She has taken this world where wilis, virgins, sylphs, sleeping princesses, the "women in white" embody the eternal — the eternally unattainable — and set it into the fabric of world history, and we see, miraculously, their pale tulle and satin pointes peeking out from the crevices of war, of revolutions, of political machinations, and on the stages of the monarchies and empires of the kings and czars who gave birth to this improbable art.

Homans's accomplishment is akin to setting the most delicate and beautiful of all the imperial Fabergé eggs into a fissure high on Mount Rushmore and tracking its unlikely survival. And the question of ballet's survival lies at the core of Homans's moving story. "Ballets," Théophile Gautier wrote, "are the dreams of poets taken seriously."

The tale of the tutu is indeed the story of a bunch of crazy dreamers, dancers, warriors of anatomy who have worked ludicrously hard to formulate, shape and perfect the highest form of the human physique, and the result is a glorious paradox: the manifestation of morality in muscle, truly Whitman's body electric. What a noble and superb cause! What folly in the face of guaranteed evanescence!

Ballet is the body divined, and it is not by chance that all the work started at the royal court in France in the mid-16th century. Homans begins with what has long been considered the first ballet, "Ballet Comique de la

Reine," which had its premiere in 1581. It was an extravagant six-hour affair, performed among the guests — elevated stages did not yet exist — in a large gallery at the Petit-Bourbon, and told an allegory of "the enchantress Circe vanquished by the powerful gods Minerva and Jupiter," ending with Circe presenting her magic wand to the king himself before a ballet of naiads, dryads, princesses and a queen. The purpose of the ballet was nothing short of elevating man, "to raise him up a rung on the Great Chain of Being and bring him closer to the angels and God." So the bar was set for this new art — and it couldn't have been higher; ballet is *about* Highness — and the angels of Homans's title take their first flight. Ballet became so revered in France that by 1636 the Abbé Mersenne, a contemporary of Descartes and Pascal, referred to "the author of the Universe" as "the great Ballet-master."

Thus ballet was born as the dance of kings. Louis XIII designed costumes, wrote librettos and danced leading roles, being particularly fond of portraying the Sun and Apollo, god of music and poetry. His son, Louis XIV, made his debut in 1651 at 13 and studied with his ballet teacher, Pierre Beauchamps, daily, for more than 20 years. The dancing master in Molière's "Bourgeois Gentilhomme" declares that "all the misfortunes of mankind, all the disasters of which history is full, the bungling of politicians and the mistakes of great generals, all come through not learning to dance." Where, I ask you, is Obama's Beauchamps?

It was Beauchamps who first codified the five positions of the body, providing "the crucial leap from etiquette to art," and they remain to this day the beautiful base of outwardly rotated feet and legs from which classical ballet rises and expands centrifugally. Homans documents this passionate path with impressive grace — she was herself a professional ballet dancer and is now the dance critic for The New Republic — across Europe from its birth in France, with stopovers in Italy, Denmark, Germany and Austria, landing in Russia in the mid-19th century and then returning to Western Europe in the early years of the 20th century, and finally, here, to America, where it reached its apogee in the last half of the century.

The stops along the way often provide great charm. It was the enchanting French ballerina Marie Sallé in the mid-18th century who introduced the novel idea, with her revealing drapery and sensual movement (she was much admired by Voltaire and Montesquieu), that women, including ones of humble origins, might dance, not just men and kings. The history of ballet is also a story of class; ballet is a language of vertical ascent, physicalized nobility. "Ballerinas," Homans writes, "*acted* like aristocrats even when in real life they most emphatically were not." But mix they did, and more than one young dancer rose — or descended — to positions other than an arabesque in the famous corridors of the Paris Opera, "the nation's harem," as one police official termed it, where wealthy men trolled for pretty girls with limber limbs.

It was the magnificent French dancer Auguste Vestris, a favorite of Marie Antoinette's, who "pried the feet open" to 180 degrees (Louis XIV had maintained a dignified 90), and they have remained there ever since. He also insisted on fully pointed feet, and thus soft, flat ballet shoes with ribbons wrapped around the ankles were born. A teacher of mammoth energy and passion, he gave lessons lasting three hours that would include "48 *pliés* followed by 128 *grand battements*, 96 *petits battements glissé*, 128 *ronds de jambes sur terre* and 128 *en l'air*." Any dancers reading this are now rolling their eyes in empathic agony, but ballet, like prayer, is ritual repetition: the more you do, the closer you get to perfection, to God. (Malcolm Gladwell's 10,000-hours-to-genius rule is a mere drop in the rosin box for a ballet dancer.) Vestris also forbade any "provincial insecure shuffling of the feet."

The French ballet master Charles-Louis Didelot, in "Psyché et l'Amour" (1809), kept "provincial" shuffling to a minimum, and his most famous ballet literally took flight not with angels but with 50 live white doves "outfitted in minicorsets and attached to wires," carrying the chariot of Venus to the heavens. What delightful imaginings are those of dancers, ever searching to soar — though one does worry about those corseted doves.

Marie Taglioni, the first ballerina still generally recognized, was born in Stockholm in 1804 into a dynasty of Italian dancers, and her rise to immortal fame is fascinating not least because she was one ugly duckling. According to Homans, she was "poorly proportioned, with a bent posture and skinny legs," though she came to symbolize not only exquisite feminine beauty but the best kind, the kind you can't have. How this determined young woman overcame these apparently extreme deficiencies and danced her way into history is a mesmerizing tale of body and soul outwitting gravity and that somewhat more horizontal pull: the male gaze.

She made her debut as ballet's iconic sylph in "La Sylphide" in 1832, a supernatural creature who was "strong but frail, sexually alluring but chaste, in love but fiercely independent." Inspired by Taglioni, Chateaubriand

called the sylphide a “masterpiece” of a woman and was driven, Homans says, into “frenzied states of uncontrolled imagination and desire.” Not bad for a “famously ugly” woman.
Taglioni’s success reached far beyond the stage, and she became “a force of anarchy and dissolution,” Homans writes, “a woman’s dancer” (in Gautier’s words). “Decent” women “had to settle for a subdued and controlled life, but underneath they were desperate to ‘abandon their soft and calm existence’ for ‘storms of passion’ and ‘dangerous emotions.’ Taglioni lived what they could only dream: a . . . fully expressed life.” And you wonder why little girls want to dance? They intuit that inside a corseted tutu lies untold freedom.
August Bournonville, an almost exact contemporary of Taglioni and a friend of Kierkegaard, was born in Denmark, but he traveled throughout Europe, studied with Vestris in Paris and even fought a duel to defend his teacher’s honor. He came home from his sojourn to direct the Royal Danish Ballet for 47 years, creating some 50 ballets, though only a handful remain. In his emphasis on precise, unsentimental footwork, free of passion and angst, he added to the lexicon of ballet as few others have.
“Excelsior,” the most successful Italian ballet in history (that you have probably never heard of), claims its place in Homans’s narrative for less than artistic reasons: it has yet to be surpassed in sheer spectacular display and bad taste. Choreographed by Luigi Manzotti in 1881, it offered a cast of “more than 500, including 12 horses, 2 cows and an elephant.” The lead roles were Light, Darkness and Civilization (the ballerina), and they were joined by Invention, Harmony, Fame, Strength, Glory, Industry and Science. This extravaganza ended with Light banishing Darkness and communing in a “warm embrace” with Civilization.
“Excelsior” had 100 performances in Milan at La Scala, and then in virtually every other city across Italy before it zoomed around the world: South America, the United States, Berlin, Madrid, Paris, Vienna and St. Petersburg. By 1931, the ballet had incorporated the “progress” of Fascism.
But as Homans points out so lucidly, while “Excelsior” was, well, ridiculous, it had an amazing side effect: it produced hundreds of performers who traveled abroad staging, dancing and teaching, spreading the seeds of ballet like dandelion florets. Among them were the illustrious Italian teacher Enrico Cecchetti, who staged Manzotti’s ballet in St. Petersburg, and Carlotta Brianza and Pierina Legnani, who became the first Princess Aurora and Odette/Odile, respectively, for the great Russian ballets of Marius Petipa, “The Sleeping Beauty” and “Swan Lake.”
While Manzotti spawned an international dynastic dancing family, all ballet dancers since the mid-19th century are the progeny of Petipa. Like Sallé, Vestris and Taglioni, Petipa was from a long line of dancers. Born in Marseille, he studied with Vestris in Paris, traveled widely and, like Bournonville, fought a duel, in Madrid with a French marquis, though Petipa’s was not over the honor of his art but over the apparent dishonor of a young lady. Petipa shot off the marquis’s jaw and jetéd away unscathed. It is comforting to know that two of the three great choreographers in ballet history — we will get to George Balanchine soon — were winning duelers, willing to risk their bodies for honor, as all dancers do.
Yes, only three men of such genius to add to and permanently change the language itself in all 400 years, so rare is the great dance maker. It would be as if all classical music had only Mozart, Bach and Beethoven, no Wagner, Verdi, Brahms, Schubert or Chopin, or all literature had only Shakespeare, Dickens and Tolstoy, no Dante, Cervantes, Dostoyevsky, Austen, Thomas Mann or Elmore Leonard.
Petipa arrived in St. Petersburg in 1847 and lived there for more than 50 years, dying in 1910 at the age of 92. He had two Russian ballerina wives, nine children, and never learned to speak Russian, though he became an eager and respected member of the czar’s court. Interestingly, he produced his masterworks, the cornerstones of the art, the Latin of all classical ballet — “The Sleeping Beauty,” “The Nutcracker” and “Swan Lake” (he also rechoreographed “Giselle” in the form we know it today) — in an astonishing late flowering after the age of 70!
This outpouring — some done with the significant help of the ballet master Lev Ivanov — was attributable, in part, to Tchaikovsky, “the first composer of real stature to see ballet as a substantial art,” Homans writes. “Petipa became a great choreographer because of Tchaikovsky, and he knew it.” She evokes the sweetness of their close collaboration: Tchaikovsky would visit Petipa’s house and play his new composition on the piano “while Petipa shifted his papier-mâché figurines around a large round table.”
By 1903 Petipa was forced to retire, and the Imperial Theaters were floundering. But within only six years Serge Diaghilev brought Russian ballet back to Paris, the place of its birth — his company, the Ballets Russes, never danced in Russia — and unleashed a frenzy of modernist creativity the results of which were widespread and groundbreaking. Never before had so many artists of note been pulled together by one man,

whose edict was “Astonish me!” His grand experiment lasted only 20 years, but its legacy is vast — perhaps most notable for two artists whom he helped usher out of Russia: Stravinsky and Balanchine. Working together and separately, they would become two of the great artists of Time, their shared subject.

Homans provides good overviews of the major players of the 20th century. British ballet, led by the formidable Ninette de Valois, Frederick Ashton and Margot Fonteyn, had its culmination in the Fonteyn-Nureyev partnership in the 1960s, though it produced its best — and certainly most enduring — gift to ballet in Michael Powell’s 1948 cinematic masterpiece, “The Red Shoes.” “During the war we were all told to go out and die for freedom and democracy,” Powell said. “After the war ‘The Red Shoes’ told them to die for art.” And why not?

Homans does justice — and then some — to the propaganda *dram-balets* under Soviet Communism and their extraordinary dancers: Galina Ulanova, Maya Plisetskaya — “a fierce and undying swan” — Vladimir Vasiliev, Natalia Makarova, Nureyev and Baryshnikov. While calling ballet “Britain’s finest cultural hour,” Homans states that “the Bolshoi’s rise signaled a sharp decline for the art of dance.” About its signature ballet, “Spartacus,” she writes, “Even at its most thrilling (Vasiliev), it was quite clearly a degraded form of art.” But ballet was an important national symbol, even if Nikita Khrushchev complained that he had seen so many “Swan Lakes” that his dreams were laden with “white tutus and tanks all mixed up together.”

The British Antony Tudor (William Cook) and the American Jerome Robbins (Jerome Rabinowitz) each get an in-depth assessment; together they form the angst-driven sadists — onstage and off — of 20th-century ballet, and each created a few classic ballets. Tudor, choreographer of “Pillar of Fire,” “Lilac Garden” and “Dark Elegies,” liked his performances to be “executed in cold blood.” “Breaking down a person isn’t hard,” he explained, but then “you’re terribly tempted to lay them flat and walk on them.”

Robbins is the undeniable King of Broadway, with works like “West Side Story,” “On the Town” and “Fiddler on the Roof,” but his ballets, his second language, never quite reached the same apotheosis. He was top second-rate (“Dances at a Gathering,” “The Cage,” “Afternoon of a Faun”), and Homans is unafraid to say so. His torture of his dancers and others — he named names before the House Committee on Un-American Activities — was matched only by his well-earned self-hatred. His parents owned a kosher deli on East 97th Street in New York, and he admitted to a strong desire “to become an American and by American I mean WASP American.” He wrote in his diary that he thought his fascination with ballet “has something to do with ‘civilizationing’ of my Jewishness. . . . The language of court and Christianity.”

And it is with “court and Christianity” that Homans arrives in the end. When she finally reaches the story of Georgi Balanchivadze, her book takes flight. She lets go of the professorial traces and dutiful descriptions that have occasionally punctuated previous pages — an editor should have fixed the multiple repetitions of “as we have seen” — and comes into her own with absolute authority. Her writing becomes inspired. Balanchine had that effect on people, and Homans was a student at his School of American Ballet (the “West Point of dance,” as his co-founder, Lincoln Kirstein, called it). Moreover, it actually feels as if she wrote the book in order to get to Balanchine, the one she loves, to put him in his deepest context, and to present him as the pinnacle of the towering pyramid of dance that she has built for him, for us. There he is, the undisputed “Yahweh” of all dance history, the Apollo of her title, accompanied by his beloved muses, his dancers, his angels, leading his chariot, no corseted doves in sight.

“His ballets are the jewel in the crown of 20th-century dance,” Homans writes. “Their depth and scope far surpass those of the dances made by Robbins, Tudor, Ashton or any of the Soviets. . . . Few doubted that Balanchine towered over them all.”

While it took a Frenchman, Petipa, to make ballet Russian, it took a Russian, Balanchine, to make it American — the most unlikely transposition the art form has ever experienced. “Classical ballet was everything America was against,” Homans explains. “It was a lavish, aristocratic court art, a high — and hierarchical — elite art with no pretense to egalitarianism,” designed “to promote and glorify kings and czars.” Whose divine right would it promote in the land of the equal, the free, the duly (and unduly) elected? But as Balanchine was fond of saying in the face of the impossible, or highly inadvisable, “Nevertheless. . . .” And he proceeded to give American dancers an aristocracy all their own.

The story of Balanchine has been told before and at greater length, but never better. Homans’s account is the best that exists — for both the novice and those in the know. The opening of the School of American Ballet in 1933, the short-lived companies, the work on Broadway, in Hollywood, and then in 1948 the birth of the New York City Ballet, the incubator for him and his dancers, where he produced his greatest work. She gives us

terrific appraisals of “Apollo,” “Serenade,” “La Valse,” “Liebeslieder Walzer,” “Agon” and “Stravinsky Violin Concerto.”

Homans even risks some close truths when she points out the reasons for the “unusual physical luminosity” of his dancers, who had “more dimension, more depth, more range” than other dancers. “Foremost among them was love,” she writes. “Not love for dancing, although that was part of it, but Balanchine’s love.” The fuel his dancers ran on was not the cottage cheese, muffins and Tab they consumed but the sheer adrenaline of love, that immeasurable, magical component that takes a body beyond itself.

Unlike Tudor and Robbins, Balanchine “was not interested in ordinary people or real social situations,” Homans says. “Rather, for him ballet was an art of angels, of idealized and elevated human figures, beautiful, chivalric and above all strictly formal.” Balanchine brought the art full circle back to Louis XIV.

“Ballet is woman,” Balanchine proclaimed, and he elaborated in a letter to Jackie Kennedy in 1961: “Man takes care of the material things and woman takes care of the soul. Woman is the world and man lives in it.” Among his multiple images and portraits of women, one dominated: “a man and a woman who come together but cannot stay together,” Homans writes, “dances that show the man alone, or abandoned by a woman who is too independent, too powerful, too goddess-like to give him the solace he needs.” Balanchine said his biography was in the ballets — and Taglioni’s anarchist sylph reigns on.

“Balanchine’s legacy was immense,” Homans concludes. “He had given the world the greatest *oeuvre* in the history of dance and made classical ballet a pre-eminently modernist and 20th-century art.” But “over the past two decades,” she writes, it “has come to resemble a dying language,” and thus she announces the awful truth. Ballet is such an ethereal, such a deeply moral exercise that it would appear to have less and less of a place in our current technology-driven world: there are no bytes for ballet.

But ballet always seems to be ending; it has been finished, in fact, many times. The ballet master Jean-Georges Noverre saw it sliding into “empty and meaningless virtuosity” by the late 18th century, and Bournonville despaired for his art when he saw the “disgusting cancan” showing its garters in Paris theaters. And in 1936, F. Scott Fitzgerald wrote of “the catastrophe of the death of Diaghilev. The sorrow of it that Zelda felt, as did many others, who seemed to feel also that the ballet was ended.”

Now, it would appear ballet is ending yet again. But this time, Homans thinks, it really is the end. “In the years following Balanchine’s death,” she writes, “his angels fell, one by one, from their heights.” Her explanation is, sadly, convincing: “Contemporary choreography veers aimlessly from unimaginative imitation to strident innovation,” while “today’s artists . . . have been curiously unable to rise to the challenge of their legacy. They seem crushed and confused by its iconoclasm and grandeur.” Terpsichore, like Victoria Page, has put on the red shoes and danced her last, no longer willing to “die for art,” so her art dies.

“At N.Y.C.B.,” Homans writes of Balanchine and Robbins’s old home, “the understandable desire to preserve its masters’ legacy has led instead to a stifling orthodoxy,” and she reports with restrained outrage of “a small but telling departure” from its former grace. “The New York State Theater, named for the people it served, was recently rechristened: it is now the David H. Koch Theater, for the millionaire whose ego and resources substitute for the public good.” In a wickedly ironic footnote, bedbugs have also recently taken up residence with Koch in Balanchine’s theater.

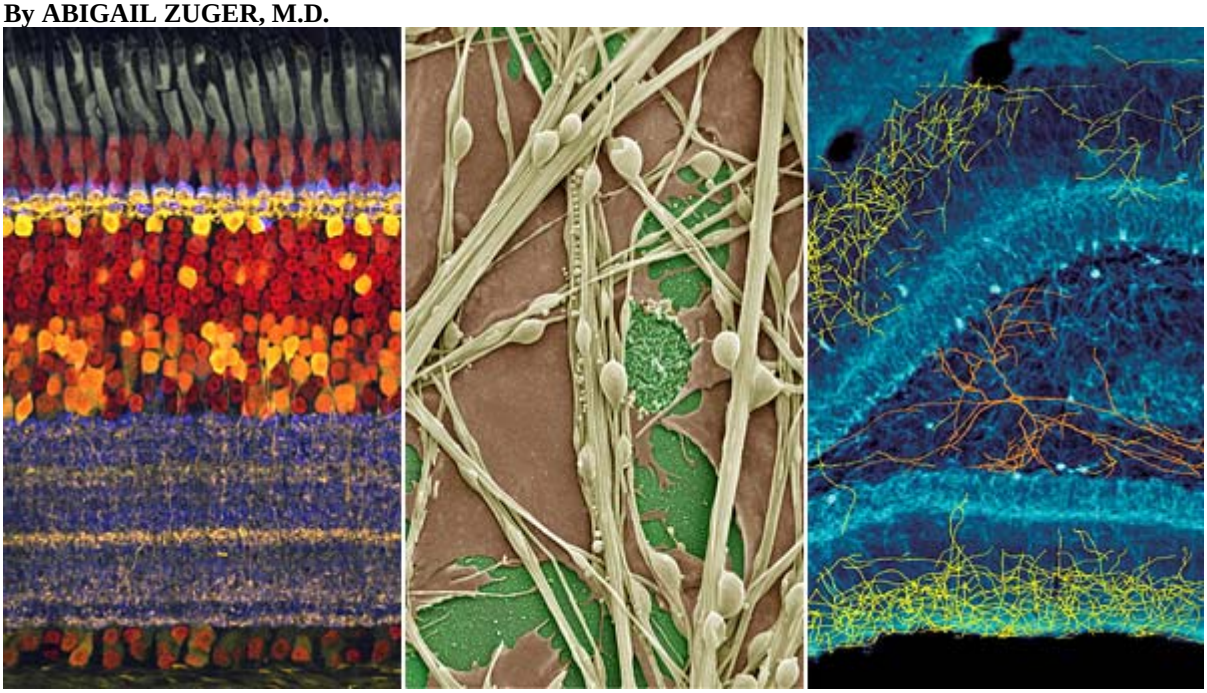
The Fabergé egg has fallen. Today’s ballerinas use Twitter, securing the fall of the fourth wall, and even Darren Aronofsky’s new ballet film, “Black Swan,” presents, uncannily, a haunting final image of a white tutu oozing blood. So what is one to do now, having seen, having known, a thing of such beauty that is facing imminent extinction? Jennifer Homans has put her mourning into action and has written its history, an eloquent and lasting elegy to an unlasting art. It is, alas, a eulogy.

Toni Bentley danced with the New York City Ballet for 10 years and is the author of five books . She is writing a book about Balanchine’s ballet “Serenade.”

http://www.nytimes.com/2010/11/28/books/review/Bentley-t.html?_r=1&nl=books&emc=booksupdateema1

An Odyssey Through the Brain

By ABIGAIL ZUGER, M.D.



SHOWER OF COLORS Carl Schoonover, 27, who is midway through a Ph.D. program in neuroscience at Columbia, decided to draw the general reader into his subject with the sheer beauty of its images in “Portraits of the Mind: Visualizing the Brain from Antiquity to the 21st Century,” newly published by Abrams

Who has seen the mind? Neither you nor I — nor any of the legions of neuroscientists bent on opening the secrets of that invisible force, as powerful and erratic as the wind.

The experts are definitely getting closer: the last few decades have produced an explosion of new techniques for probing the blobby, unprepossessing brain in search of the thinking, feeling, suffering, scheming mind. But the field remains technologically complicated, out of reach for the average nonscientist, and still defined by research so basic that the human connection, the usual “hook” by which abstruse science captures general interest, is often missing.

Carl Schoonover took this all as a challenge. Mr. Schoonover, 27, is midway through a Ph.D. program in neuroscience at Columbia, and thought he would try to find a different hook. He decided to draw the general reader into his subject with the sheer beauty of its images.

So he has compiled them into a glossy new art book. “Portraits of the Mind: Visualizing the Brain From Antiquity to the 21st Century,” newly published by Abrams, includes short essays by prominent neuroscientists and long captions by Mr. Schoonover — but its words take second place to the gorgeous imagery, from the first delicate depictions of neurons sketched in prim Victorian black and white to the giant Technicolor splashes the same structures make across 21st-century LED screens.

Scientists are routinely seduced by beauty. Mr. Schoonover knows this firsthand, as he acknowledged in an interview: for a while his wallet held snapshots not of friends or family, but of particularly attractive neurons. Sometimes the aesthetics of the image itself captivate. Sometimes the thrill is the magic of a dead-on fabulous technique for getting at elusive data.

Consider, for instance, a blurry little black-and-white photograph of a smiley-face icon, so fuzzy and ill-defined it looks like a parody of the Shroud of Turin. The picture is actually a miracle in its own right: the high-speed video camera that shot it was trained on the exposed brain of a monkey staring at a yellow smiley face. As the monkey looked at the face, blood vessels supplying nerve cells in the visual part of the monkey’s

brain transiently swelled in exactly the same pattern. We can tell what was on the monkey's mind by inspecting its brain. The picture forms a link, primitive but palpable, between corporeal and evanescent, between the body and the spirit. And behind the photo stretches a long history of inspired neuroscientific deductions and equally inspired mistakes, all aiming to illuminate just that link.

It's only fitting that the story should be a visual one, for the visuals had the ancients fooled for millenniums. The brain was so irredeemably ugly that they assumed the mind was elsewhere.

Aristotle, for example, concluded that the brain's moist coils served only to cool the heart, the obvious home of the rational soul. The anatomist Galen pointed out that all nerves led to the brain, but medieval philosophers figured that most of the important things happened within the elegantly curved fluid-filled ventricles deep inside.

Only when the long ban on dissection petered out in the Renaissance did the ventricles prove to be so much empty space — poke the brain around a little, and they collapse and disappear. The gelatinous brain moved into the spotlight, as resistant to study as a giant mass of tightly packed cold spaghetti.

The challenge was twofold: what did that neural pasta really look like, and how did it do what it did?

In 1873 the Italian scientist Camillo Golgi developed a black stain to highlight the micron-thin neural strands. Fifteen years later the Spanish scientist Santiago Ramón y Cajal, deploying the stain with virtuoso dexterity, presented the world for the first time with visible populations of individual neurons, looking for all the world like burnt scrub brush in a postapocalyptic Dalí landscape. The roots, or dendrites, of these elongated nerve cells gather information. The trunks, or axons, transmit it.

Now those same skeletal silhouettes glow plump and brightly colored, courtesy of a variety of inserted genes encoding fluorescent molecules. The most dramatic variation on these methods for highlighting neurons in living color, dubbed the Brainbow by its inventors, turns the brains of living mice into wild neon forests of branching trees.

The electrochemical circuitry that propels information around that forest, from nerve to nerve, has generated its own fabulous images.

One team of researchers harnessed the rabies virus, which has the unusual ability to travel upstream against the neural current. The virus moves from a leg bitten by a rabid dog up the long axons leading to the spinal cord, then jumps to dendrites of other nerves and travels up to the brain, where it causes horrific damage. Modifying the virus by a few genes and inserting it in mice, the researchers captured its path in a photograph, highlighting the long axon of the first nerve in brilliant magenta and then the tangle of dendrites of communicating nerves in yellow.

Meanwhile, the traffic in long groups of neurons all coursing together around the brain becomes visible with a variation on the standard scanning technique called diffusion M.R.I. Here the neurons do look just like pasta — angel hair, perhaps — slightly beaded, draped and purposeful. But if the structure is destroyed (by a stroke, for instance) the strands shatter into fragments, the information highway broken, upended as if by an earthquake.

In the book's final essay, Joy Hirsch, a neuroimaging specialist at Columbia, sympathizes with readers who hate the idea that they — their essential selves, their likes and dislikes, their premonitions, biases and life decisions — are nothing but neural circuits.

"These cells and molecules, awash in various neurochemical cocktails in my basal ganglia, are presumably the basis for my love and attachment to my husband," she writes. "Earlier in my academic journey I would have resisted this unavoidable fact of biology on the misguided rounds that a physical basis would diminish the grandeur and centrality of my choice of a life partner."

Now, however, Dr. Hirsch says she joyfully embraces "the astonishing unity of the physical brain and the mind" for the potential it clearly holds for improving the lot of humankind. And furthermore, she doesn't see that anyone has much choice about accepting it.

"People assumed for thousands of years that there must be something else," the scientist Jonah Lehrer writes in the introduction. "And yet, there is nothing else: this is all we are."

http://www.nytimes.com/2010/11/30/science/30brain.html?ref=books

On an Innovative Device, Apps Lacking Imagination

By ALICE RAWSTHORN

Atomic Antelope
"Alice for the iPad," Atomic Antelope's interactive version of Lewis Carroll's "Alice in Wonderland.

LONDON — Imagine that you're a designer and a dazzling new digital device comes along giving you the opportunity to reinvent some familiar products that the rest of us use every day. What could be more exciting? Not much, you'd think, especially if that device is a soaring commercial success, and rich, powerful companies are eager to invest in your efforts to design new versions of their products to be used on it.
The device in question is the Apple iPad, and those products are the publishing applications (alias "apps") that enable us to read books and magazines on it. With so much going for them why, eight months after the iPad's release, is the design of so many of those apps so boring?
There are a few honorable exceptions, and I'll come to them later. But having spent much of the past week downloading (or sometimes struggling to download) book and magazine apps in the search for design gems, I've come to the glum conclusion that most were designed with little or no imagination.
All the designers seem to have done is to have shunted the original printed products on to the screen. There's nothing wrong with doing that for electronic readers, including the Amazon Kindle or Sony Touch, but not when it comes to more sophisticated devices such as the iPad and all of the rival products now flooding on to the market like Samsung's Galaxy Tab. These devices offer thrilling possibilities for us to do much more than read words on a screen, and it is deeply disappointing that so few designers and publishers are embracing them.
(If you're wondering why I haven't mentioned newspaper apps yet, that's because I don't intend to. Thanks to their constantly changing content and shortish texts, newspapers made a more successful transition to the Internet than books or magazines, and it is less of a design challenge to reinvent their Web sites as applications.)
But lack of imagination isn't the only problem when it comes to creating book and magazine apps. Some have messed up technically. Take "Vogue Stylist," an app from "American Vogue" that promises to help you to "create personalized fashion and beauty looks based upon the top trends identified by Vogue Editors." Sounds

tempting, except that downloading the app seems to be infuriatingly tricky judging by the disgruntled cries of "Ugh!!," "Fix it Vogue" and "Make it Work!!" in the Customer Reviews posted on Apple's iTunes online store.

At this point, I should stress that, when it comes to the techno-politics of reading, I'm strictly neutral, neither technophile nor technophobe. I love reading, especially when it involves beautifully written words in a beautifully designed form, but don't mind which medium they come in.

In the last week alone, three exquisitely crafted new books have landed on my desk: "Atlas of the Conflict: Israel-Palestine" designed by Joost Grootens; "Misfit," a monograph of the designer Hella Jongerius by Irma Boom; and the sumptuous "Sinbad" by the artist Gerhard Richter. Each book was so thoughtfully conceived and executed that I can't imagine it being more appealing in another medium. But my love of print doesn't blind me to the benefits of publishing apps, if — and it's a big if — their design is up to scratch.

In theory, those apps should combine the benefits of old and new media. They should be as compact, portable, legible and lusciously visual as print, while scoring eco-points by saving paper. Offering interactive features, moving images and links to alternative information sources also enables them to be as dynamic as Web sites. There are even reports that people with dyslexia find it easier to read words on apps than in print, though no one knows why.

Some designers and publishers, the "honorable exceptions," have explored these possibilities. Among the magazine apps, both "Wired" and "The New Yorker" stand out for their efforts to do so.

"The New Yorker" has adopted a subtle approach by producing an app that looks just like the original magazine. Any new features are designed in the same witty, thoughtful spirit, including the "Cartoon Gallery" of the week's cartoons and a soundtrack of the short story being read by its author. Reading the "New Yorker Digital Edition" on the Internet tends to make me feel queasy, but the app is easier on the eye and more playful than either that or the print issue.

The "Wired" app achieves a similar result, but more spectacularly by experimenting with new creative technologies in its extra features. The November app includes stunning data visualizations of the daily pattern of 311 complaint calls in New York, and the December one a high-definition film of a mouse's brain.

As for books, children's titles are leading the way with apps that include animated illustrations, often activated by the reader. My favorites are the fabulously surreal ones in "Alice for the iPad," Atomic Antelope's interactive version of Lewis Carroll's "Alice in Wonderland," and Oceanhouse Media's "Dr. Seuss" apps. Kids can "play" the Dr. Seuss stories like movies — saving you from reading the same one again and again. Each word is highlighted when it is spoken on the soundtrack.

There has been less experimentation for grown-ups. Though the British publishing house Fourth Estate has produced an intriguing app based on the mathematician Marcus du Sautoy's book "The Num8er My5teries." Rather than replicate the book, it complements it by enabling the reader to participate in animated mathematical puzzles featuring a cartoon version of Mr. Sautoy.

Not every book app lends itself to show-stopping design. With great novels, for instance, the text is often enough on its own. Though that doesn't excuse designers from trying to be more inventive with other apps. If not, readers may resort to deploying iPad versions of apps like Instapaper and Readability with which they are already "redesigning" Web sites. Unless they can muster more imagination and ingenuity, publishing app designers may face another readers' revolt.

http://www.nytimes.com/2010/11/29/arts/29iht-design29.html?ref=books

What Evil Lurks

By TERRENCE RAFFERTY
FULL DARK, NO STARS
By Stephen King
368 pp. Scribner. $27.99

Illustration by Otto Dettme

"From the start — even before a young man I can now hardly comprehend started writing 'The Long Walk' in his college dormitory room — I felt that the best fiction was both propulsive and assaultive," Stephen King writes in a chatty afterword to "Full Dark, No Stars," his new collection of longish stories. "It gets in your face." As if we didn't know.

"Full Dark, No Stars" contains, as King's earlier "Different Seasons" and "Four Past Midnight" did, a quartet of previously unpublished tales that more than satisfy their prolific author's stated criteria for good fiction. Propulsive? Check. Assaultive? Don't ask. The stories in "Full Dark, No Stars," whose lengths range from 30-some pages to well over 100, are for the most part only lightly supernatural and deal, instead, with the unlovelier aspects of merely human behavior. Serial rape and murder figure prominently in two of these stories; in another, a man kills his wife and forces his teenage son to help him; and in the only fully fantastic tale here, a man purchases — from the Devil, of course — health and happiness at the too-affordable price of the ruin of his best friend's family. It's grim stuff, but that's what readers expect of Stephen King. After all, he's been in our faces for 40 years.

What's amazing, and maybe a little unsettling, about King is the consistency of his purpose and his manner over that long stretch of time. He's essentially the same grab-you-by-the-lapels literary showman he was in the pulpy, punchy horror stories he used to peddle to men's magazines and, a bit later, in his early novels "Carrie" and " Salem's Lot." Unlike most writers, he seems never to have become bored with his own peculiar gifts — to have tired of the wonderful toys left under the tree for him when he was a kid. He might, as he claims, have a tough time imagining himself as an 18-year-old composing his first novel, but it's no problem for us, his readers, because King at 63 still writes with the verve and glee and heedless ease of a very young man. He has not mellowed perceptibly. He has not put aside childish things. When you're reading the grisly tales in "Full Dark, No Stars," carried along by his rollicking, vivid prose, you think (if you're thinking at all): "God help him, this man is having fun."

A writer who takes such unabashed joy in the act of storytelling is a rarity. This naked pleasure is King's secret ingredient: it makes his work — good or bad — weirdly irresistible, even addictive. And it disarms criticism, as boyish enthusiasm often does. You might feel, as I do, that "Fair Extension," the deal-with-the-Devil story in "Full Dark, No Stars," is too glib and casual to bear the moral weight it aspires to, but it seems

almost rude to say so. You might also think (as I do) that the long suspense story “Big Driver,” about a woman who suffers and then violently avenges a roadside rape, is a bit too easy for King: there were a couple of similar escape-and-revenge yarns in his 2008 collection “Just After Sunset.” You could think that. But you wouldn’t really feel good about it.

King’s compulsion to entertain — both himself and the enormous public whom he now, kind of archly, addresses as “Constant Reader” — is, however helpless, a form of generosity, a gift horse not to be looked in the mouth. (His readers should know by now that it’s unwise to look into *anything* dark and moist. Especially if there are teeth.) The sheer volume of his output protects him some, too. In the vast ocean of King fiction, the weaker stuff just sinks from memory without a trace, and without much damage to the reader’s confidence in him: a sturdier vessel is always heaving into view on the horizon. And that’s the case with “Full Dark, No Stars,” which starts with a good story called “1922,” loses its way for a while — in “Big Driver” and “Fair Extension” — and then winds up with another pretty strong one, “A Good Marriage.”

The two better stories even have a sort of common theme: in both, people feel themselves, at moments of crisis, somehow doubled, split in two. Darcy Anderson, the heroine of “A Good Marriage,” sometimes senses the presence of another self behind the mirror: a “Darker Girl” when she was young, and later a “Darker Wife,” living what she calls “the Darker Life, where every truth was written backward.” Whatever the reasons for her youthful mirror fantasies, she discovers ample justification for gloomy imaginings in the 28th year of her marriage, when she happens upon clues to the secret life of her husband, Bob, a dark stranger indeed. In Bob’s shadow existence, away from her, he commits terrible crimes which *he* attributes to the presence of another person inside himself: the malign spirit of a dead childhood friend. (It’s an extremely crowded marriage.) King works the double motifs deftly and guides the narrative to a satisfyingly cathartic climax — after which he supplies a nifty denouement in the form of a dialogue between poor shattered Darcy and a sly old retired cop.

“A Good Marriage” is a characteristic King performance, speedy and craftsmanlike and solidly unnerving. (It’s characteristic, too, in the slight gender bias King has always, gallantly, displayed: in his work, men do violence because they’re bad, and women do violence only in self-defense or retaliation.) “1922” is less typical, because it’s set in a fairly distant past rather than in King’s usual here and now, and in the rural Midwest rather than in his native New England, where the other stories in “Full Dark, No Stars” take place. It’s also the only story here told in the first person. The change of air (and voice) suits him: “1922” has a mournful gravity that the other tales mostly lack, in part perhaps because its diction is free of the bursts of baby-talk slang that have become a nasty habit of his in recent years. (Elsewhere in the book, you’re brought up short by painful coinages like “Easy-as-can-beezy” and “nuzzle-bunny.”) The narrator of “1922,” a Nebraska farmer named Wilfred James, murders his wife because she wants to sell off part of the family farm and move to the city. Wilfred tries to tell himself, as the serial killer of “A Good Marriage” does, that someone else is the author of this awful act: “I believe,” he writes, a few years after the event, “that there is another man inside of every man, a stranger, a Conniving Man,” and that it was this evil double who did the deed. He can’t quite persuade himself, though: the stark memory of the crime is all his, and the dire consequences are visited not on the imaginary other, but on him — and on his son, whom he has made his accomplice.

King’s rambunctious fiction doesn’t often attempt a tragic tone, but “1922” does, and nearly achieves it. Although he has toyed with the idea of doubles and split personalities before (notably in “The Shining” and “The Dark Half”), there’s a particularly intimate sense of horror in “1922” because the sad story is told in the voice of one of the afflicted. Not much, I’d guess, truly scares Stephen King, but in this tale his prose feels haunted, as if he had, for once, spooked himself. For a hard-charging writer like King, the thought of another self inside the self is as disquieting a night-terror as can be imagined. He has been himself — confidently, propulsively, assaultively — for so long. It’s too late to come face to face with the stranger inside.

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http://www.nytimes.com/2010/11/28/books/review/Rafferty-t.html?ref=books

What Was I Thinking?
By NED BLOCK
SELF COMES TO MIND
Constructing the Conscious Brain
By Antonio Damasio
367 pp. Pantheon. $28.95

In “Self Comes to Mind,” the eminent neurologist and neuroscientist Antonio Damasio gives an account of consciousness that might come naturally to a highly caffeinated professor in his study. He emphasizes wakefulness, self-awareness, reflection, rationality, “knowledge of one’s own existence and of the existence of surroundings.”

That is certainly one kind of consciousness, what one might call self-consciousness. But there is also a different kind, as anyone who knows what it is like to have a headache, taste chocolate or see red can attest. Self-consciousness is a sophisticated and perhaps uniquely human cognitive achievement. Phenomenal consciousness by contrast — what it is like to *experience* — is something we share with many animals. A person who is drunk or delirious or dreaming can be excruciatingly conscious without being wakeful, self-aware or aware of his surroundings.

The term “conscious” was first introduced into academic discourse by the Cambridge philosopher Ralph Cudworth in 1678, and by 1727, John Maxwell had distinguished five senses of the term. The ambiguity has not abated. Damasio’s distinctive contributions in “Self Comes to Mind” are an account of phenomenal consciousness, a conception of selfconsciousness and, most controversially, a claim that phenomenal consciousness is dependent on self-consciousness.

Phenomenally conscious content — what distinguishes the experience of blue from the taste of chocolate — is, according to Damasio, a matter of associations that are processed in different brain areas at the same time. What makes a conscious state feel like something rather than nothing is explained as a fusion of mind and body in which neurons become “extensions of the flesh.” Self-consciousness is the result of a procession of neural maps of inner and outer worlds. What’s more, he argues, phenomenal consciousness depends on self-consciousness. Without a self, he writes, “the mind would lose its orientation. . . . One’s thoughts would be freewheeling, unclaimed by an owner. . . . What would we look like? Well, we would look unconscious.”

Even fish and lizards have a kind of minimal self, one that combines sensory integration with control of information processing and action. But Damasio’s self is not minimal. It is inflated with self-awareness, reflection, rationality, deliberation and knowledge of one’s existence and the existence of one’s surroundings, and this is what he ends up arguing a being needs in order to have phenomenal consciousness.

You may have sensed that I think there is a problem with Damasio’s emphasis on self-consciousness: indeed, “Self Comes to Mind” is mainly about self-consciousness rather than experiential phenomenal consciousness. And the book is not about geology or underwear or many other things either. So what?

I can explain the problem by a brief detour into a different book, “The Origins of Consciousness in the Breakdown of the Bicameral Mind” (1976), by the American psychologist Julian Jaynes. Jaynes held that consciousness was invented by the ancient Greeks between 1400 and 600 B.C. He argued that there was a dramatic appearance of introspection in large parts of the “Odyssey,” as compared with large parts of the “Iliad,” which he claimed were composed at least a hundred years earlier. The philosopher W. V. Quine once

told me that he thought Jaynes might be on to something until he asked Jaynes what it was like to perceive before consciousness was invented. According to Quine, Jaynes said it was like nothing at all — exactly what it is like to be a table or a chair. Jaynes was denying that people had experiential phenomenal consciousness based on a claim about inflated self-consciousness.

Damasio also denies phenomenal consciousness because of the demand of a sophisticated self-consciousness. You may have noticed an exciting report a few years ago of a patient in a persistent vegetative state (defined behaviorally) studied by the neuroscientists Adrian Owen and Steven Laureys. On some trials, the two instructed the patient to imagine standing still on a tennis court swinging at a ball, and on others to visualize walking from room to room in her home. The patient, they found, showed the same imagistic brain activations (motor areas for tennis, spatial areas for exploring the house) as normally conscious people who were used as controls.

More such cases have since been discovered, and this year Owen and Laureys described a vegetative-state patient who was able to use the tennis/navigation alternation to give yes-or-no answers to five of six basic questions like “Is your father’s name Alexander?” These results are strong evidence — though not proof — of phenomenal consciousness in some of those who showed no behavioral signs of it. But Damasio scoffs, saying that these results “can be parsimoniously interpreted in the context of the abundant evidence that mind processes operate nonconsciously.” His skepticism appears to be grounded in the fact that these patients show no clear sign of self-consciousness and thus constitute a potential roadblock in front of his theory.

Damasio also stumbles over dreaming. In dreams, phenomenal consciousness can be very vivid even when the rational processes of self-consciousness are much diminished. Damasio describes dreams as “mind processes unassisted by consciousness.” Recognizing that the reader will be puzzled by this claim, he describes dreaming as “paradoxical” since the mental processes in dreaming are “not guided by a regular, properly functioning self of the kind we deploy when we reflect and deliberate.” But dreaming is paradoxical only if one has a model of phenomenal consciousness based on self-consciousness — on knowledge, rationality, reflection and wakefulness.

Contrary to Damasio’s point of view, there is good evidence that vivid conscious experience may be antithetical to self-reflective activity. In one experiment, the Israeli neuroscientist Rafi Malach presented subjects with pictures and asked them to judge their own emotional reactions as positive, negative or neutral — a self-oriented, introspective task. He then presented different subjects with the same pictures and asked them to very quickly categorize the pictures as, for example, animals or not. Of course these subjects were seeing the pictures consciously, but Malach found that the brain circuits involved in scrutinizing self-reactions (as indicated by the emotional reaction task) were inhibited in the fast categorization task. Subjects also rated their self-awareness as high in the emotional reaction task and low in the fast categorization task. As Malach puts it, these results comport with “the strong intuitive sense we have of ‘losing our selves’ in a highly engaging sensory-motor act.”

Damasio argues that a creature without sensory integration and control of thought and action would be unconscious. But even if that is true, it does not show that phenomenal consciousness requires self-awareness, reflection, wakefulness, or awareness of one’s existence or surroundings. This argument conflates the minimal self with the inflated self.

Is this discussion of any practical importance? Yes. Phenomenal consciousness is what makes pain bad in itself and pleasure good. Damasio’s refusal to regard phenomenal consciousness (without the involvement of the inflated self) as real consciousness could be used to justify the brutalization of cows and chickens on the grounds that they are not self-conscious and therefore not conscious. Damasio, in response to those who have raised such criticisms in the past, declares that in fact he thinks it “highly likely” that animals do have consciousness. But this doesn’t square with the demanding theory he advances in his book, on the basis of which he denies consciousness in dreams and in “vegetative state” patients who can answer questions. He owes us an explanation of why he thinks chickens are conscious even though dreamers and the question-answering patients are not.

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http://www.nytimes.com/2010/11/28/books/review/Block-t.html?ref=books

Statesman, Fixer
By ROGER LOWENSTEIN
DEALINGS
A Political and Financial Life
By Felix Rohatyn
Illustrated. 292 pp. Simon & Schuster. $27

Brendan McDermid/Reuters

Felix Rohatyn's memoir, modestly titled "Dealings: A Political and Financial Life," is the sort of vaulting success story that makes one yearn for the big-hearted America of the mid-20th century, a less mean and more innocent time when not every career seemed calculated and not every banker was a subject of scorn, and when the country welcomed enterprising immigrants.

In that genteel era, Wall Street catered to flesh-and-blood investors as opposed to pools of mortgages; and investment banks, if not exactly free of scoundrels, were run by captains who shunned such trade as would injure their clients because, at least on their better days, they believed in something. And when a young Felix Rohatyn, less than a decade after a daring flight from Nazi-occupied France, called on Lazard Frères, its chief executive, André Meyer, sensing Rohatyn's ambivalence, grandly offered to school him at various firms in Europe so that Rohatyn could test his fondness for banking.

Thanks to Meyer, Lazard stood for "quality rather than quantity," Rohatyn writes. "We were gentlemen, not hucksters." Overcoming his doubts, he was soon advising Harold Geneen of ITT fame, then Steve Ross, the future architect of Time Warner. Charming nearly everyone he met, Rohatyn quickly advanced.

Mergers and acquisitions were Rohatyn's calling card, and he played it to the hilt. But he also developed a flair for crisis-fixing, a skill that would lead to peril and then to fame. In the early 1970s, after ITT announced a merger with Hartford Fire Insurance, the Justice Department moved to block the deal. Rohatyn lobbied the department to drop its opposition — which ultimately it did. Then, based on a sensational leaked memo, ITT was accused (wrongly, according to the author) of buying influence with the Nixon White House. Rohatyn, a lifelong Democrat, was suddenly at the center of a scandal, tarred by a columnist at The Washington Post as "Felix the Fixer."

But fixing (no pejorative intended) was what Rohatyn did. In 1970 he had been tapped to lead a Wall Street committee charged with heading off a burgeoning crisis: many of the biggest brokerage houses were undercapitalized and failing (sound familiar?). Rohatyn's success, and his desire for full redemption from the ITT affair, led to a bigger pro bono assignment from New York's governor, Hugh Carey: saving New York City from bankruptcy, a feat he accomplished by wrestling wary bankers, skeptical union bosses and reluctant politicians into shared sacrifice. All the while, he was still hatching deals. The kid whose family got past a checkpoint in Marseille while a German guard lighted a cigarette was chummy with Barbara Walters and

dined at Elaine's alongside Woody Allen. If you mattered in '70s New York you were Felix's friend; if you weren't his friend, you didn't matter.

And when, in 1988, the Big Daddy of corporate fiefs, RJR Nabisco, was put "in play," who do you think was hired by the board to manage the auction? By then, Rohatyn was lamenting the disappearance of the clubbier, more cautious Wall Street that had taken him in: he bewailed the excesses, the greed, the junk bonds, the overuse of leverage.

It happened that Rohatyn the banker, in doing his deals (the blockbuster RJR buyout in particular), was a contributor to those very trends. He is a trifle two-faced on this score; he frowns on hostile raids but does them when no alternative presents itself; he criticizes serial acquirers but heaps praise on his client Geneen, whose board was wont to rubber-stamp five acquisitions in a single session. Still, Rohatyn's stories are so good, and his cast of characters, ranging from Frank Sinatra to Ivan Boesky, is so rich, we really don't care.

Rohatyn recounts a visit to the White House when he briefed President Nixon on the looming brokerage crisis. Horrified, Nixon ordered Rohatyn to update John Mitchell, the attorney general and a former Wall Street lawyer, every night at 10. When Rohatyn called, he frequently got Mitchell's wife, Martha: "It was often apparent that she had been drinking, and then I would be forced to listen with mute politeness as she raged on about Vietnam, radical students, left-wing pinkos and the cabals in Washington."

Other vignettes afford a penetrating glimpse into investment banking. After MCA, a Hollywood studio and Rohatyn client, was approached by RCA, which owned the NBC network as well as defense interests, Rohatyn realized that RCA was itself vulnerable. He quickly landed on the perfect suitor — Jack Welch of General Electric. "At its core," Rohatyn observes, "banking is not simply about profit, but about personal relationships." He is no mean psychologist. He read the crafty talent agent Michael Ovitz perfectly, and when Ovitz relayed a bid for MCA, Rohatyn took a day or so to respond so that MCA, as his client, would not seem overeager. Even at the top, hard-to-get is a useful tactic.

"Dealings" is enlivened by Rohatyn's eye for the telling detail and some trenchant asides. He recalls that when fleeing Europe, he secreted his family's gold coins in empty toothpaste tubes. Later, he writes of a certain corporate lair, "The boardroom, like everything at RJR, was gigantic." Of Henry Kravis, Rohatyn says slyly, he "was not a man to reveal his intentions." On the lifestyle of the "imperious" Geneen, who maintained a breakneck schedule whether in Europe or in the United States by ignoring the local time, "the curtains were always tightly drawn; neither daylight not starlight would intrude into Geneen's realm." And lest one think that a banker's life is dull, Rohatyn regales us with run-ins with figures reputedly linked to the mob, and with a visit to the fund king Bernie Cornfeld. He was escorted by two assistants, each "a towering blonde" in a provocative miniskirt. Cornfeld offered Rohatyn his choice of tea or either of the assistants; Rohatyn assures us, "Pleasantly, I rejected both offers."

A certain disjointed quality detracts from these stories; "Dealings," as the word suggests, remains a series of episodes, a pointillist sketch more than a completed canvas. We enter his home only twice, and Rohatyn keeps his personal life at a distance, sometimes offering only enough detail to confuse. His provenance, alternately described as Polish and Austrian, is never quite clarified, and after his family reaches New York, via Casablanca and Brazil, Rohatyn suddenly materializes as a senior at Middlebury College with no discussion of any adjustment to life in the United States. Then, on Page 18, he abruptly informs us he is married; later, and just as abruptly, he is a single father. Still later we find him married again.

Rohatyn would have liked to cap his career with a big government job, perhaps at the Federal Reserve; it didn't happen. In 1997, he was named ambassador to France — an emotionally satisfying position, given his background, but not center stage.

As ambassador he extolled American market capitalism (never popular in Europe), but when he returned to the United States, in the Bush years, he reverted to his role as critic. In 2005, he warned that excessive leverage could trigger "a global financial crisis." Alas, that did not stop him from soon becoming a consultant to one of the most leveraged banks of all, Lehman Brothers. Although Rohatyn never resolves this conflict — is he a statesman or a Wall Street fixer? — "Dealings" balances engagingly on the seam of a remarkable career. Roger Lowenstein is a contributing writer for The Times Magazine. His latest book, "The End of Wall Street," was published in April.

http://www.nytimes.com/2010/11/28/books/review/Lowenstein-t.html?ref=books

The Devils' Playground
By JOSHUA RUBENSTEIN
BLOODLANDS
Europe Between Hitler and Stalin
By Timothy Snyder
524 pp. Basic Books. $29.95

Hulton Archive/Getty Images
Homeless peasants near Kiev in 1934, during the famine engineered by Stalin

For most Americans, who remember World War II as beginning in 1941, it is necessary to recall that Europe had succumbed to an infatuation with violence long before the United States entered the conflict. Timothy Snyder, a professor of history at Yale, compels us to look squarely at the full range of destruction committed first by Stalin's regime and then by Hitler's Reich. Each fashioned a terrifying orgy of deliberate mass killing.

In "Bloodlands," Snyder concentrates on the area between Germany and Russia (Poland, Ukraine, the Baltic region and Belarus) that became the site of horrific experiments to create competing utopias based on class or race war. For Stalin, this meant controlling "the largest social group in the Soviet Union, the peasantry." They needed to be driven off small plots of land into more efficient collective farms; many were forced to move to factory zones to sustain rapid industrialization.

Ukraine became ground zero for the resulting artificial famine. The regime confiscated grain for the cities, while sealing the borders to prevent people from escaping, or bearing witness. The *Holodomor*, as Ukrainians call it, destroyed over three million men, women and children. More than 2,500 were sentenced for cannibalism in 1932 and 1933. By 1937, "the Soviet census found eight million fewer people than projected," largely in Ukraine. Stalin refused to circulate the information and, consistent with his usual practice, "had the responsible demographers executed."

But Stalin was not done. Within a few years, the Great Terror, as it was called, engulfed party officials and the Red Army, leading to the execution of tens of thousands of officers and officials. The Terror also involved the killing of hundreds of thousands of peasants and members of national minorities, most notably Soviet Poles, and again more Ukrainians. Stalin felt the need to explain the casualties of collectivization by blaming enemies who had sabotaged his plans. Poles inside the Soviet Union, who numbered over 600,000 at that time, fit the bill. Ordered to make large-scale arrests, the state police looked for Polish names in the telephone book. In Leningrad, nearly 7,000 people were rounded up; a vast majority were executed within 10 days.

With the start of World War II in September 1939, Hitler soon occupied a large part of Poland. But he did not immediately engage in genocide against the Jews. It's true that ghettos were constructed in Warsaw and Lodz,

and that tens of thousands of Polish Jews perished from random shootings, exposure and disease. Still, this was not yet the Holocaust. At the time, Hitler had in mind the extermination of a good many Poles: “the educated, the clergy, the politically active.” Such a plan would probably have killed more than the three million Polish Jews that the Nazis eventually murdered. And there was an even broader goal — *Generalplan Ost* — that was designed to eliminate somewhere between 31 million and 45 million Slavs to give the Germans living space in the East. Snyder cannot help concluding that “the Germans intended worse than they achieved.” But once Hitler invaded the Soviet Union on June 22, 1941 — “the beginning of a calamity that defies description,” Snyder writes — he turned his full attention to the Jews.

Snyder recounts an aspect of the Holocaust that remains unfamiliar to many Americans. Even today, the prevailing image is the fate of Jewish families like Anne Frank’s, who were rounded up and transported to killing centers in Poland. But it was in German-controlled Soviet territory that the Nazis carried out the full logic of their murderous intentions. Within a half-year, the Wehrmacht succeeded in occupying all of Ukraine, Belarus and the Baltic States. And it was here, with the murder first of Jewish men and then of the entire Jewish populations of small towns, that the Germans began the systematic open-air massacres that resulted in the slaughter of two and a half million Jews in German-occupied Soviet territory, a proportion of the six million that remains hard to grasp. Babi Yar was a ravine outside Kiev where the Germans killed more than 33,000 Jews in two days of continuous shooting; this atrocity was matched by thousands of similar massacres, large and small, until 1944, when the Red Army succeeded in driving the Wehr-macht out of Soviet territory.

Drawing on material in several European languages, including memoirs and scholarly literature, Snyder recounts this sequence of mass murder — by Stalin and then by Hitler — which accounted for 14 million civilian deaths in little more than a dozen years. Every nationality in the region and many other categories — Poles, Ukrainians, Belarussians, Soviet P.O.W.’s and Jews — were victimized.

Snyder punctuates his comprehensive and eloquent account with brief glimpses of individual victims, perpetrators and witnesses, among them the Welsh journalist Gareth Jones, who wrote about Soviet Ukraine and Nazi Germany in the 1930s; Vsevolod Balytskyi, Stalin’s security chief for Ukraine, who invented the “Polish Military Organization” to explain the famine and justify a roundup of Soviet Poles; and the frightful Vasily Blokhin, one of Stalin’s most reliable executioners, who wore “a leather cap, apron and long gloves to keep the blood and gore from himself and his uniform.” Blokhin is reported to have personally shot more than 7,000 Polish prisoners in 28 days as part of the notorious Katyn massacre in 1940.

But “Bloodlands” falters when Snyder comes to deal with the aftermath of the war in the Soviet Union. Stalin became obsessed with the Jews. Members of the Jewish Anti-Fascist Committee, which had conducted an effective propaganda campaign on behalf of the wartime alliance between the Kremlin and the Western democracies, were arrested and convicted in a secret trial in 1952. Snyder fails to grasp the significance of the case. Claiming there were 14 defendants (in fact there were 15), he refers to them as “more or less unknown Soviet Jews.” But the 15 included five renowned Yiddish writers and poets, men like Peretz Markish and David Bergelson, who had international reputations. And the leading defendant, Solomon Abramovich Lozovsky, was an old Bolshevik who had been mentioned by John Reed in “Ten Days That Shook the World” for his role in revolutionary Petrograd. He is even referred to in the diaries of Joseph Goebbels; it was Lozovsky, as deputy Soviet foreign minister, who responded to Goebbels’s demagogic attacks on the Soviet government.

Not long after the Red Army had liberated Auschwitz, the remnants of Soviet Yiddish culture found themselves subjected to secret trials and executions. This sent a disheartening signal to the surviving Soviet Jews, leading them to believe that they had no place in Soviet society and spurring them to try to leave the country. Within two decades, the Jewish emigration movement, together with the broader Soviet human rights campaign, contributed to the collapse of the Soviet Union itself.

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http://www.nytimes.com/2010/11/28/books/review/Rubenstein-t.html?ref=books

Our Unlettered Landscape
By CHRISTOPHER R. BEHA
THE LOST ART OF READING

Why Books Matter in a Distracted Time
By David L. Ulin
151 pp. Sasquatch Books. $12.95

"We come to books," David L. Ulin writes in "The Lost Art of Reading," "to be challenged and confounded, made to question our assumptions." With this principle in mind, here is the news that Ulin brings in this slim, meandering book: that reading is "an act of contemplation"; that such an act becomes more difficult in "our overnetworked society, where every buzz and rumor is instantly blogged and tweeted, and it is not contemplation we desire but an odd sort of distraction"; that the analphabetic anger of anonymous Internet comment threads is emblematic of a "degraded cultural conversation" in which "the ability to carry out a logical argument" has been lost; that technology brings a boon but also a burden: "We are never disconnected, never out of touch"; and lastly, coming full circle, that in this "landscape of distraction," reading becomes not just an act of contemplation but one of "resistance."

All of which is true enough, but that's precisely the problem. While I occasionally disagreed with Ulin's book, I wasn't once challenged or confounded or even surprised by it. In fairness to Ulin, one could object that I'm not the book's intended audience, convinced as I already am of "why books matter in a distracted time." But this objection deepens the problem. If a friend who has fallen away from the habit of reading for pleasure (or else never acquired it) should ask me what to read, I can choose from a nearly endless shelf, tailoring my recommendation to her particular interests and tastes. If — less likely — she should ask me *how* to read, my options are fewer but still plenty. James Wood's "How Fiction Works" is as good a primer on engaging with literary fiction as one could want; Zadie Smith's recent "Changing My Mind" and similar collections of essays and reviews by Cynthia Ozick and Daniel Mendelsohn offer the opportunity to listen in while a great reader goes about the task. But if my friend should ask me *why* to read — *whether* to read — it

would only beg the question to respond by handing her a book. If those of us who already take most of Ulin's conclusions as articles of faith are not his intended audience, who exactly is?

Ulin is a critic for The Los Angeles Times and formerly the newspaper's book editor, and "The Lost Art of Reading" began life last year as a brief essay in that paper. The essay was widely circulated and discussed, mostly by way of e-mail and blog referrals — a fact that might have made Ulin question his assumptions (though apparently it did not). Now Ulin has spun his essay out to book length, mostly by way of autobiographical material about his life as a reader and his relationship with his reading-resistant son, Noah. There are also political observations, largely of a piece with the rest of the book. Thus, we are told that the primary battle between Hillary Clinton and Barack Obama — "without a white man in sight" — was "truly revolutionary." During the general election that followed, we are told, Sarah Palin rather than John McCain "came to represent the anti-Barack Obama." We are told that politicians now regurgitate talking points on "The View" and "The Oprah Winfrey Show." And Ulin suggests this might all be otherwise if only more people practiced the lost art.

I can easily imagine forwarding Ulin's original article to my hypothetical friend seeking a reason to take reading seriously. Likewise, I can imagine her stumbling on it herself, impulsively clicking a link while in search of entertainment news or the latest box office take. But it's difficult to picture such a person buying and reading this feathered-out version of the essay in book form. One might ask why Ulin expanded the essay at all, except that the uninspiring answer — because an editor offered to publish it — is presented up front, in Ulin's acknowledgments.

There is no pleasure to be had in dealing roughly with a work as well meaning as Ulin's; it feels almost perverse to criticize a book for being too agreeable. And yet. As a reviewer, Ulin must know that books themselves make up a healthy tributary of this river of information in which we're all drowning. The publishing industry, like every industry, needs product to push, notwithstanding the fact that a truly necessary book is a rare thing. Here is a challenging and confounding truth you won't find anywhere in Ulin's pages: There are too many books, and this is part of the problem. David Ulin's intentions are beyond reproach, but his book is another distraction.

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http://www.nytimes.com/2010/11/28/books/review/Beha-t.html?ref=books

Failure to Communicate

By NEIL MacFARQUHAR
ARAB VOICES
What They Are Saying to Us,and Why It Matters
By James Zogby
248 pages. Palgrave Macmillan. $25

In Iraq, the United States Army often lacked the Arabic translators desperately needed to decipher documents captured from insurgents who were planting hidden explosive devices that killed and maimed American soldiers by the hundreds. In New York City, the opening of a charter school where pupils might master the intricacies of Arabic was all but thwarted by vociferous critics, many of them vocal supporters of Israel, who made it sound as if a terrorist training camp was opening in Brooklyn.

That kind of illogical disconnect, James Zogby argues in "Arab Voices: What They Are Saying to Us and Why It Matters," dooms much of what the United States is undertaking in the Middle East. The book can make for dry reading. It consists of poll numbers harvested mostly in the Middle East since 9/11 by Zogby International, a polling company run by the author's brother. But as Zogby suggests, demonizing the very people, culture and religion that the United States hopes to influence and change — rather than really studying what the Arab world says and thinks — is not a terribly smart approach.

"Simply put," he writes, "years of neglect combined with efforts to actively suppress teaching Arab history and culture left the United States ill prepared for an ever deepening engagement in the region." And while it's true "that many in the Arab world admire aspects of American life, U.S. policy in the region has increasingly undermined Arab attitudes toward America as a global model."

In the last few months, of course, the United States was gripped by the twin news stories of a marginal Florida preacher threatening to put a torch to Korans and of the fight over whether Muslims should be allowed to construct a cultural center, including a mosque, near ground zero in Lower Manhattan. Calmer heads made the point that American soldiers serving abroad in Afghanistan and Iraq, not to mention other Americans with interests across the Muslim world, suffer the fallout from incidents like these.

The problem, which "Arab Voices" persuasively illustrates, is that Americans tend to project their fears and desires onto Arabs and Muslims rather than searching for common ground. Zogby opinion polls point to important contributions that Americans could make in winning Arab support. Finding a fair solution to the Israeli-Palestinian dispute invariably tops the list, but improving education, employment and health care in the Arab world also matter. Yet instead of analyzing its policy failures, Zogby says, Washington ignores them or just shouts louder.

A particularly worrisome gap concerns the Arabic language. As a longtime correspondent in the Middle East, I was often struck by the fact that ambassadors from China and Russia, as well as Britain, often spoke beautiful, classical Arabic. American envoys rarely could.

Although the number of American students studying Arabic has doubled since 9/11 and now totals 23,000, only 2,400 have reached an advanced level. Zogby points out that there are as many undergraduates studying ancient Greek as there are studying Arabic, and a recent Government Accountability Office study reported that more than 33 percent of federal employees who were supposed to use Arabic in their diplomatic work were unable to speak the language at the required level.

Beyond communication, the larger problem, as Zogby sees it, is that Americans are mired in five sometimes contradictory myths about the Arab world: that all Arabs are the same; that there is no Arab world; that all Arabs are angry; that the prism of Islam dominates their world view; and that they are imprisoned between past and present. Each of these myths gets a chapter in the book.

Born in upstate New York to Lebanese Christian immigrant parents, Zogby has long been part of the Washington firmament. He is the founder of several Arab American organizations, including the Arab American Institute, which battles discrimination and lobbies for a less Israel-centric Middle East policy.

Many of the so-called experts on Islam who churn out negative stereotypes do so, he argues, to promote support for Israel; Arab Americans with real knowledge of the subject aren't interviewed, or they are labeled as biased. Yet among the more interesting poll results he cites are that Americans overall want to steer a middle course in the Arab-Israeli dispute and that Jewish and Arab Americans view a negotiated peace along similar lines.

It's evident that Zogby is frustrated by American failings, but it must also be said that he glosses over the faults of Arab leaders. The widening reach of the secret police in Jordan does not help the image of King Abdullah as a friend of the United States. And the tradition of Saudi princes throwing open their doors to receive petitions from the public — which Zogby calls part of the "social contract" — might have been an effective governing technique in the days when King Abdul-Aziz kept the treasury in a trunk, but it now smacks of a continuing desire to treat the people as subjects rather than citizens.

What's more, Zogby occasionally finds superficial examples amid the welter of his polling data to make his points. The fact that he interviewed two Tunisian students with affiliations to the Muslim Brotherhood while they watched a bawdy Italian television game show is rather facile evidence that religious fundamentalists can be open minded.

Still, it's hard to deny the validity of Zogby's larger argument. To succeed in the Middle East, the United States needs to listen more to actual Arab voices, and not let preconceived myths about the Muslim world dictate policy.

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http://www.nytimes.com/2010/11/28/books/review/MacFarquhar-t.html?ref=books

The Benefits of Weight Training for Children

By GRETCHEN REYNOLDS

Trisha Cluck/Getty Images

Back in the 1970s, researchers in Japan studied child laborers and discovered that, among their many misfortunes, the juvenile workers tended to be abnormally short. Physical labor, the researchers concluded, with its hours of lifting and moving heavy weights, had stunted the children's growth. Somewhat improbably, from that scientific finding and other similar reports, as well as from anecdotes and accreting myth, many people came to believe "that children and adolescents should not" practice weight training, said Avery Faigenbaum, a professor of exercise science at the College of New Jersey. That idea retains a sturdy hold in the popular imagination. As a recent position paper on the topic of children and resistance training points out, many parents, coaches and pediatricians remain convinced that weight training by children will "result in short stature, epiphyseal plate" — or growth plate — "damage, lack of strength increases due to a lack of testosterone and a variety of safety issues."

Kids, in other words, many of us believe, won't get stronger by lifting weights and will probably hurt themselves. But a major new review just published in Pediatrics, together with a growing body of other scientific reports, suggest that, in fact, weight training can be not only safe for young people, it can also be beneficial, even essential.

In the Pediatrics review, researchers with the Institute of Training Science and Sports Informatics in Cologne, Germany, analyzed 60 years' worth of studies of children and weightlifting. The studies covered boys and girls from age 6 to 18. The researchers found that, almost without exception, children and adolescents benefited from weight training. They grew stronger. Older children, particularly teenagers, tended to add more strength than younger ones, as would be expected, but the difference was not enormous. Over all, strength gains were "linear," the researchers found. They didn't spike wildly after puberty for boys or girls, even though boys at that age are awash in testosterone, the sex hormone known to increase muscle mass in adults. That was something of a surprise. On the other hand, a reliable if predictable factor was consistency. Young people of any age who participated in resistance training at least twice a week for a month or more showed greater strength gains than those who worked out only once a week or for shorter periods.

Over all, the researchers concluded, "regardless of maturational age, children generally seem to be capable of increasing muscular strength."

That finding, which busts one of the most pervasive myths about resistance training for young people — that they won't actually get stronger — is in accord with the results and opinions of most researchers who have studied the subject. "We've worked with kindergartners, having them just use balloons and dowels" as strength training tools, "and found that they developed strength increases," said Dr. Faigenbaum, a widely acknowledged expert on the topic of youth strength training. (His most recent book is in fact titled "Youth Strength Training.")

But interestingly, young people do not generally add muscular power in quite the same way as adults. They rarely pack on bulk. Adults, particularly men but also women, typically add muscle mass when they start weight training, a process known as muscular hypertrophy (or, less technically, getting buff). Youths do not add as much or sometimes any obvious muscle mass as a result of strength training, which is one of the reasons many people thought they did not grow stronger. Their strength gains seem generally to involve "neurological" changes, Dr. Faigenbaum said. Their nervous systems and muscles start interacting more efficiently. A few small studies have shown that children develop a significant increase in motor-unit activation within their muscles after weight training. A motor unit consists of a single neuron and all of the muscle cells that it controls. When more motor units fire, a muscle contracts more efficiently. So, in essence, strength training in children seems to liberate the innate strength of the muscle, to activate the power that has been in abeyance, unused.

And that fact, from both a physiological and philosophical standpoint, is perhaps why strength training for children is so important, a growing chorus of experts says. "We are urban dwellers stuck in hunter-gatherer bodies," said Lyle Micheli, M.D., the director of sports medicine at Children's Hospital Boston and professor of orthopedic surgery at Harvard University, as well as a co-author, with Dr. Faigenbaum, of the National Strength and Conditioning Association's 2009 position paper about children and resistance training. "That's true for children as well as adults. There was a time when children 'weight trained' by carrying milk pails and helping around the farm. Now few children, even young athletes, get sufficient activity" to fully strengthen their muscles, tendons and other tissues. "If a kid sits in class or in front of a screen for hours and then you throw them out onto the soccer field or basketball court, they don't have the tissue strength to withstand the forces involved in their sports. That can contribute to injury."

Consequently, many experts say, by strength training, young athletes can reduce their risk of injury, not the reverse. "The scientific literature is quite clear that strength training is safe for young people, if it's properly supervised," Dr. Faigenbaum says. "It will not stunt growth or lead to growth-plate injuries. That doesn't mean young people should be allowed to go down into the basement and lift Dad's weights by themselves. That's when you see accidents." The most common, he added, involve injuries to the hands and feet. "Unsupervised kids drop weights on their toes or pinch their fingers in the machines," he said.

In fact, the ideal weight-training program for many children need not involve weights at all. "The body doesn't know the difference between a weight machine, a medicine ball, an elastic band and your own body weight," Dr. Faigenbaum said. In his own work with local schools, he often leads physical-education class warm-ups that involve passing a medicine ball (usually a "1 kilogram ball for elementary-school-age children" and heavier ones for teenagers) or holding a broomstick to teach lunges safely. He has the kids hop, skip and leap on one leg. They do some push-ups, perhaps one-handed on a medicine ball for older kids. (For specifics about creating strength-training programs for young athletes of various ages, including teenagers, and avoiding injury, visit strongkid.com, a Web site set up by Dr. Faigenbaum, or the Children's Hospital Boston sports medicine site.)

As for the ideal age to start weight training, Dr. Faigenbaum said: "Any age is a good age. But there does seem to be something special about the time from about age 7 to 12. The nervous system is very plastic. The kids are very eager. It seems to be an ideal time to hard-wire strength gains and movement patterns." And if you structure a program right, he added, "it can be so much fun that it never occurs to the kids that they're getting quote-unquote

http://well.blogs.nytimes.com/2010/11/24/phys-ed-the-benefits-of-weight-training-for-kids/?ref=magazine

The Professor of Micropopularity
By CARLO ROTELLA

Paolo Pellegrin/Magnum Photos, for The New York Times

ON A MONDAY evening in September, James Schamus and a dozen students in his graduate seminar in film theory at Columbia University were discussing the dialogues of Plato. Each participant who spoke called on the next speaker, and Schamus gave the group plenty of leeway to tussle with the text, but every once in a while he raised his hand and intervened to guide the conversation. The course was called Seeing Narrative, and the discussion centered on Plato's skepticism about the ability of any visible thing to represent ideal truth — a skepticism that, say, a bunch of beautiful images strung together in a movie could communicate the perfect, invisible idea of Beauty.

Schamus, in bow tie and jacket, his mobile face alight with intentness, said: "In Plato, the philosopher's job is to love knowledge, *logos*, but it's always corporealized, and the body fools your senses, your perceptions. The soul is invisible and doesn't change, and it wants to connect to other such invisible, unchanging things" — including Truth and Beauty in their ideal forms — "but it's trapped in a body that's always taking it to visible things that are never the same."

During a break at the midpoint of the four-hour seminar, Schamus checked his BlackBerry. There were, as usual, lots of messages pertaining to his other job: for the past nine years he has been C.E.O. of Focus Features, the specialty unit of Universal Pictures. As the head of a successful movie studio owned by a giant corporation, Schamus finances, produces and distributes movies that are "independent" to the extent that that label describes a style, a target audience, a price tag. "They make smart movies for low budgets," as Tim Gray, who oversees Variety, put it. Focus's Oscar winners include "Milk," "The Pianist" and "Lost in Translation," among others.

Schamus has also had a prolific career as a writer and producer. He has made 11 films with the director Ang Lee, including "Crouching Tiger, Hidden Dragon" and "Brokeback Mountain." Along with two partners, Schamus ran Good Machine, a production company that between 1991 and 2002 made and distributed a series

of important indie films like “Safe” and “The Brothers McMullen.” Until he got too busy with Focus, Schamus, who is 51, also did uncredited rewrites on the kind of expensive popcorn movies that Focus Features doesn’t make (but he wouldn’t tell me which ones).

The messages that came in while Schamus taught Plato included a notice that a preview screening of “Hanna,” a thriller to be released next April, had been moved from Nyack, N.Y., to Paramus, N.J. Other messages tracked how “The American” was doing in Europe and how DVD sales of the strange-but-cute documentary “Babies” were doing at Target. The news was good.

Focus was doing remarkably well in a time when the movie industry was still in the midst of an upheaval brought about by the decline of the DVD, piracy and the general economic crisis, among other factors. After a boom in the late ’90s and early ’00s, when hedge-fund money flooded Hollywood and the indie sector was riding high, the ensuing contraction had taken out many of Focus’s competitors. Paramount Vantage, Warner Independent and other specialty units were gone, but Focus was hanging on with one of the largest shares of the indie market, exploiting its excellent relationships with distributors around the world.

“Focus has made a profit every year,” Schamus told me on another occasion. “Some years it was modest profit, and in some years we did extremely well. But modest profit is not enough. We’re part of a big corporation; our margins have to be justified. I’m not particularly a fan of late capitalism in general, but I realize our movies have to make a profit.”

With extended speculation in the air that the cable company Comcast would buy Universal from NBC, a deal that could either include Focus or lead to it being sold off as a separate entity, Schamus was under more pressure than usual to have a very good year. So far, so good. “Greenberg,” a slacker romance starring Ben Stiller, did not do as well at the box office as it did with critics, but “Babies” did surprisingly well, and “The Kids Are All Right” and “The American” were breakout successes. With two releases still to go, 2010 was shaping up as a big winner.

There really isn’t anyone else like Schamus. There’s no precedent for a real academic — he’s a professor of professional practice in Columbia’s School of the Arts, a teacher and scholar who has served on the editorial board of Cinema Journal — to have a first-rate career as a writer, a producer and an executive in the film industry. As Tim Gray put it: “There have been a couple of film scholars who wrote scripts, but he’s the only person in the business I’ve ever seen who said, ‘I can’t go to Cannes because I’ve got to work on my doctorate.’ I liked his book about Dreyer, but I understood about a third of it.” The book, based on Schamus’s dissertation, is a study of the Danish director Carl Theodor Dreyer’s “Gertrud,” a film that Schamus has described as “the single-most obscure Scandinavian formalist failure.”

Schamus makes his home in one of the academy’s most cloistered corners, where film theorists, cultural critics and philosophers formulate critiques of cinema and capitalism from the detachment afforded by an elite discourse that’s often impenetrable to nonspecialists. They’re usually as far removed from the actual sausage-making of the film industry as they can get, and mostly prefer it that way. But the combination of intellectual enthusiasm, eclectic taste, extremely high executive function and a roaring appetite for solving complex problems in stimulating company can take a thinking person to strange places.

When the seminar reconvened after the break, Schamus said, “Let’s dive into the Meno,” a dialogue in which Plato and Socrates consider virtue. “The heart of it is the mathematical proof.” He rose from his seat and went to the whiteboard, where he drew figures and scribbled numbers as he worked through the geometry. “You can only get the proof visually,” he concluded, stepping back and gazing at it. Plato may be skeptical about the category of the visual, he said, but “you are confronted with a visual proof that gets you back to the idea embedded in visuality.”

Hands went up all around. A woman said, “So you can’t get to that higher plane without a nudge from daily existence” — and off they went into the Meno, each speaker calling on the next in turn. They got so involved in the discussion that they ended up skipping the film they were scheduled to watch, Ingmar Bergman’s “Persona.”

I’m in this weird corner of the business,” Schamus told me, “where the capital’s just low enough that the only way to succeed is to throw out the focus groups and make a compelling case that our stuff is different.”

He rides the subway from his apartment near Columbia to the offices of Focus Features, which occupy multiple floors in a building on Bleecker Street. Focus has branches in Los Angeles and London, but most of its 110 employees are in New York. In Schamus’s sunny, high-ceilinged office there are family pictures — he is married to the novelist Nancy Kricorian, and they have two teenage children — and souvenirs from his

movies: a “Brokeback Mountain” throw pillow inscribed with “Love Is a Force of Nature”; a green plastic Hulk fist.

Focus Features is known as a director’s studio. By controlling budgets and preselling international distribution rights to finance productions, Schamus can position artists to make the movies they really want to make, as long as they want to make movies that don’t cost too much and that he can sell. “What we strive for is a genuine alternative voice, but one that speaks *to* people,” he told me. “We want to get people who are turned away from the mainstream to turn a bit toward it, and those turned toward it to turn a little away.”

In practice, turning a movie toward the mainstream might mean just a small adjustment to the soundtrack. When I was hanging around his office in April, he said on the phone: “They need something to make it smoother. How about a viola, dude?” Or it can mean cutting to conform more tightly to the demands of a genre. Ang Lee told me that after screening an early cut of “Brokeback Mountain,” he ran into Schamus in the theater’s bathroom. “It was still too long,” Lee said. “James said: ‘Ang, that was great, but it was three hankies and two bladders. My goal is four hankies and one bladder.’ ” Schamus, whose personal tastes tend toward the forbiddingly arty — no hankies and five bladders, à la Jean Eustache’s post-*nouvelle vague* navel-gazer “The Mother and the Whore,” would be fine by him — sometimes finds himself working hard to ensure that a Focus production doesn’t turn out to be the kind of film he loves best.

But he also nudges filmmakers the other way, a little further from the mainstream. Even the indie-est directors, he said, may internalize the demands of the industry and find themselves trying to make the movie they think a studio would want them to make. “There’s so much pressure now, and they get to a point in the process where they start playing defense, worrying too much about trying to be commercial,” he said. “So I find I’m constantly telling our filmmakers that it’s my pressure, not theirs. Relax, play offense and go make your movie. I have my notes and ideas, and yes, we need movies we can sell, but we need good movies to sell, and fear isn’t conducive to good filmmaking.”

Playing offense artistically often means letting a film violate some Hollywood expectations, letting it be a little slower or more abstract or bookish or otherwise alien-seeming than what’s in the multiplex — in short, weirder. “Weird” is one of his keywords, a crucial element of his business model.

Of course, Focus movies aren’t high-art provocations like “Gertrud” or the kind of avant-garde films that Schamus shows in class: Ernie Gehr’s “Serene Velocity,” Stan Brakhage’s “Window Water Baby Moving.” The indie formula, which can be as narrow as the action-movie formula, calls for just enough weirdness to distinguish a movie from standard Hollywood fare but not so much that it slides out of the realm of commercial cinema and into the margins shared by the art film and mutant bottom-feeding forms of pulp cinema too bizarre to reach a mass audience.

David Bordwell, the distinguished film scholar, says of Schamus: “He’s very good at figuring out the sweet spot, that middle range where independent cinema has to be. Ideally you have some stars, strong content, often from good books, and it needs to be offbeat enough to seem fresh, but it has to be still recognizably part of a familiar cinematic tradition, something challenging but not too challenging.”

The moderate weirdness that puts a Focus movie in the sweet spot bespeaks an ethos as well as a bottom-line strategy. “There’s a certain subversiveness at work in Schamus,” Eugene Hernandez, a founder of Indiewire.com, says. “With ‘Brokeback’ and ‘Milk,’ for instance, there’s more to it than an acclaimed film that has Oscar potential.” In each case, Focus got the most out of a committed gay audience while marketing the film as a widely accessible story with a universal theme. While scrupulously avoiding displays of righteousness, Schamus clearly enjoyed doing great box office and winning awards while putting homosexual characters center stage in otherwise traditional renditions of the Western and the biopic.

Schamus, who is forthright about his lefty politics, discounts any crude ideological intent in making queer movies, or in, say, distributing a road movie about the young Che Guevara (“The Motorcycle Diaries”). Rather, he says, he is drawn — and audiences who think of themselves as outside the mainstream are drawn — to stories of outsiders. “The story of America, of Western culture, is often the story of queer culture, of being Jewish” — Schamus is Jewish — “of being outsiders and refugees who find a place that is the not-place.” His personal experience, he says, reinforces his taste for such stories. “I grew up basically covered with psoriasis,” he said, “and I skipped grades, so I do tend to gravitate to the kid in the corner, who, incidentally, is most likely to grow up to be one of our directors.”

But, he insisted, “if I tried to run a studio on the principle of making movies that had certain gender politics, or any politics, that I approved of, we’d go out of business fast. When I’m here,” as C.E.O., “I’m solving

problems in the culture business, cutting trailers and doing promotions and figuring out audiences. I put things together all day. Then, when I go home at night, I can take them apart" as an academic.
There is a middle way; think of it as the moment of perfect overlap at twilight. He said, "If we can make it profitable to use the common language of film, a language that addresses a public, to say something worth saying that was previously unsaid or unsayable, then those things get said." That such movies have to turn a profit in order to exist, a condition of truly public utterance in a capitalist society, just adds another element to the puzzle, one more rule to the game.
THE SON OF lawyers, Schamus grew up in Southern California and attended Hollywood High School and a couple of colleges before graduating from the University of California, Berkeley and going on to graduate school in English there. While working on his dissertation, he moved to New York City and drifted into the movie business, starting out, he said, as "the oldest production assistant on earth."
The dissertation fell by the wayside as he teamed up with Ted Hope to form Good Machine. They billed themselves as the no-budget kings of New York; their motto was "The budget is the aesthetic." Hope, an advocate of radically decentralized media democracy, was the revolutionary; David Linde, who came over in 1997 from Miramax International (and eventually went on to be co-chairman of Universal Pictures), was the business guy; and Schamus was supposed to be the avant-gardist, the intellectual, but his love of solving multifactor problems awakened the manager within.
During his Good Machine period, Schamus also began solving problems for Ang Lee — helping him stretch a grant from the government of Taiwan to make the Chinese-American family drama "Pushing Hands," fixing lines of dialogue. Schamus was soon producing and writing Lee's movies. "I know he thinks a lot about what's the best for me to do," Lee told me, "and I keep that in mind, even when we disagree. He only acts as much or as little as I need him to."
Lee also began to rely on Schamus for fresh inspirations. "After 'Eat Drink Man Woman,' I was out of stories to tell," Lee said. "With 'Sense and Sensibility' and 'The Ice Storm,' we started taking chances on new things." Schamus told me: "I have to write a script that scares him enough to make trying to make it worthwhile. They're very underwritten, and he has to figure them out as he goes along. So he spends the whole time asking me: 'Why? Why are we making this movie?' "
Schamus also steers his partner through the eternal dance of turning toward and away from the mainstream. Lee recalled, "I was cutting the bamboo sequence," a celebrated fight scene in "Crouching Tiger." "One night I pick up the phone to talk to James; I was thinking a lot about 'Hamlet,' and I was very excited. He said: 'Remember you're doing a movie in the same genre as "Drunken Master." You're not doing Drunken Hamlet.' "
There was another writing problem, in an even more formally constrained genre, that Schamus set himself to solve. When Berkeley invited him to give a commencement address eight years ago, he decided that it would be a good opportunity to finish his incomplete Ph.D. Dusting off his dissertation, he carved out extra research and writing time from his schedule, pulling all-nighters when he had to. "My dissertation committee was really selfless with their time, but they were tough," Schamus said. He panicked, briefly, when they rejected an entire chapter. "They were right, it was tangential, but my rear end was hanging out. I had set it up so failure was not an option. I had to give the address. My parents were coming. My kids were coming." He got it done in the end and marched with the other graduates in 2003.
IN EARLY SEPTEMBER, Schamus spent a weekend at the Toronto Film Festival, where a Focus Features release, "It's Kind of a Funny Story," had its world premiere. "What I want to do while I'm here is go see all the films that almost everybody else despises," he told me. "But that's not what my business is." What he did in Toronto, mostly, was sit for two days in a plush hotel suite and receive small groups of executives in the indie trade, many with European accents.
The meetings were occasions for familiar trading partners to renew connections and extend feelers. They all gushed relentlessly about how brilliant and moving their films were and about the genius of the talent in their employ. This can be hard to take after a while, but the indie-movie sector is an enthusiast's business, and Schamus is a natural enthusiast. He can get excited about all sorts of things: the aesthetic theory of the French philosopher Jacques Rancière, "E.T.," Scandinavian art cinema (in June he gave a talk in Oslo at a symposium on Liv Ullmann and was relieved when Ullmann laughed at the funny parts), the ultra-green house in upstate New York he built in 2000, good food and fine wine and his studio's movies.

Schamus let his visitors crow about their recent successes and current projects, and he took his turn to tout his slate of coming releases, among them Sofia Coppola's "Somewhere"; Cary Fukunaga's "Jane Eyre"; Lone Scherfig's "One Day," a romantic drama starring Anne Hathaway; Kevin Macdonald's "Eagle," a Roman frontier adventure starring Channing Tatum; and Joe Wright's "Hanna."

Schamus also talked up a film about Fela Kuti, the Nigerian afrobeat king, that he has in long-term development. "It's not a biopic," he said. "It's experimental in form," with long movements based on Fela's rambling songs. "I don't do passion projects, but this could be a 'Battle of Algiers,' on that level." He had lined up the British video artist and director Steve McQueen to direct it, and the Nigerian poet Chris Abani was writing the script while Schamus tried to make the budget work. Filming in Nigeria would give the right look, but Ghana might be easier, and perhaps they could shoot interiors in South Africa. "It's too expensive," he said, "but we'll figure it out."

Schamus accepted a lot of compliments from fellow executives and filmmakers in Toronto. Focus had come to town on a roll, at a high point of its very good year. Creative promotion of "Babies" had paid off, and "The Kids Are All Right," which Schamus described to his staff as "the third of three sperm-donor movies out there," had just crossed the $20 million mark, the industry's most successful limited-platform release of the year. (A platform release, the opposite of a wide release, opens first in a few selected theaters and then gradually expands to more on the strength of word of mouth, reviews and judiciously adjusted marketing.) And "The American," a coolly meditative spy film directed by the Dutch photographer and music video auteur Anton Corbijn, and starring George Clooney, was No. 1 at the domestic box office. "It's a big deal for us," Schamus said. "As of today we broke $20 million, going into its second weekend. Even if the film fell off a cliff into an abyss we'd be way ahead, and it's not doing that."

Schamus was perversely proud that CinemaScore, which predicts how a film will do at the box office on the basis of exit polls of moviegoers, had given "The American" a D-minus. "On our wide releases there's an almost inverse relationship between audience polls and success," he said. "CinemaScore polls at outlying theaters, and it works very well for movies made for the broadest mainstream audience, but it's been proven again and again that the metrics become nearly useless if you make something weird. We take the metrics as no more than a hermeneutic puzzle."

For Schamus, the key to the puzzle was that "The American," a rigorously formulaic genre movie composed and paced like an art film, was weird enough to provoke strong reactions. While an A from CinemaScore was always welcome, he said, "a B or B-minus is 'eh.' I'd rather have a C-minus or D, knowing that people have strong reactions. It's O.K. if a lot of people don't like it, as long as the people who love it are spreading word of mouth with passion, getting others excited." Focus can aim to pique the interest of the minority of moviegoers who think of themselves as independent types; big studios like Universal have to please most of the rest or go broke.

The artistic cherry atop the ice cream sundae of happy business news during Schamus's stay in Toronto came when he got word from Italy that "Somewhere," which opens in December as Focus Features' final release of the year, had won the prestigious Golden Lion at the Venice Film Festival — an honor also won by two Lee-Schamus films, "Brokeback Mountain" and "Lust, Caution."

The only shadow on the otherwise glorious weekend was that "It's Kind of a Funny Story," an understated tale of a suicidal teenager's transformative stay in an adult mental ward, seemed too slight to prosper. The premiere was well received, and reviews were kind, but it went on to disappoint at the box office.

IN TORONTO, I asked Schamus, as I had been asking periodically for months, about the relationship between running a studio and being a scholar. As usual, he resisted combining his vocations into one overarching project. He said: "I don't want to be saying, 'My interest in property and privacy informs my work at Focus, and vice versa.' When I'm at the office, I do the job." We were in a car at the time, passing bus-stop posters for "The American" that featured a dark-suited Clooney running with a tasteful little gun in his hand. "The job has to be done under certain conditions, and they're dynamic, and I have to adjust."

It's true, though, that a main element of the dynamic conditions in which he does business is the relationship between art and commerce, which is also a principal focus of his academic interests. "It is all about intellectual property," he conceded: he's all about how ideas circulate in markets. He's interested in the conditions of possibility in which creative people work — from the mechanics of making a living to the philosophical questions raised by setting aside a category of commodities called Art to the prospects for

saying the previously unsaid by using the common vocabulary of word and image (which is where Plato comes in).

Usually Schamus shifts from making culture for profit to analyzing the results of process, but there are times when the two roles flow together. One was when Good Machine pitched Todd Solondz's black comedy "Happiness" to studios. As Schamus described the experience: "I would go in there and say: 'It's about subjectivity in late capitalism, the overproduction of desire. We spend about one-third of our G.D.P. convincing ourselves to buy what we make. What Todd's talking about is desire when it's unmanageable within the system, unattached to something you can buy.' It was bought by October Films, which had been bought by Universal, which had been bought by Seagram. They ended up freaking out and giving the movie back to us."

Schamus also employs high theory as equipment for living in a book he is writing, "My Wife Is a Terrorist: Lessons in Storytelling From the Department of Homeland Security," which will be published by Harvard University Press. There is a government surveillance file on Nancy Kricorian because she is active in Code Pink, a women's antiwar group. Using as his primary text a copy of her file, secured after an A.C.L.U. suit, Schamus employs speech-act theory, narratology and other interpretive frameworks to plumb the meanings of an opaque document consisting mostly of blacked-out pages. Along the way he considers how the culture industry and intellectuals might respond to the state's role as "the most prolific and influential producer of popular narrative."

He did a trial run of this project as an "anti-keynote address" at the London International Film Festival in 2009. Some in attendance were thrilled, some put off, many perplexed. An ironic *explication de texte* that would have fit right in at an academic conference seemed weird in that context, and elicited strong reactions.

BETWEEN CLASSES AT Columbia on a lovely September afternoon, Schamus found a spot in the sun behind Dodge Hall to smoke a cigar. "For me," he said, "the happiest place on earth is a well-run school. If I have a false nostalgia, it's for an ongoing conversation in which anyone can say anything interesting, a conversation you have in public, and that includes people who are dead. To the extent that I have a management style, I try to replicate that environment."

His conversations with students and filmmakers have in common a desire to get them to stop trying to please an imaginary internalized Professor or Studio Head and free themselves to say something original, fresh and useful — something constructively weird.

He realizes that his current arrangement, with one foot in the movie business and the other in the academy, is not necessarily permanent. "I would be happy to run Focus for the next 20 years," he told me in an early conversation, "but I have to be ready for that not to happen." His role model, he told me half-jokingly, is the poet Su Tung-p'o, an 11th-century Chinese bureaucrat who served faithfully until he fell out of favor and was twice sent into exile. "Some of it is the translation," Schamus said, "but you read him and it feels so weirdly modern, as if he were talking to you today." (Here, for example, is a portion of "On First Arriving at Huang-Chou": "Funny — I never could keep my mouth shut;/it gets worse the older I grow/ . . . An exile, why mind being a supernumerary?/Other poets have worked for the Water Bureau.")

As we sat in the sunny quadrangle amid the eternal rhythms of the university, I asked, "If that happens to you, if your run in the movie industry comes to an end, do you come back here?"

He said: "This isn't exile. This is *work*. I don't see the university as a retreat from anything."

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http://www.nytimes.com/2010/11/28/magazine/28Schamus-t.html?ref=magazine

Junking Junk Food

By JUDITH WARNER

Susana Raab

Earlier this month, Sarah Palin showed up in Bucks County, Pa., with "dozens and dozens" of cookies, suggesting that the state's schoolchildren risked losing the right to the occasional classroom treat because of a high-minded anti-sugar edict from the board of education. Pretty much everything about the setup was wrong. Pennsylvania wasn't, as Palin tweeted, in the midst of a "school cookie ban" debate. And the school she turned into a photo op wouldn't have been subject to such a ban had one existed; it wasn't a public school but a private Christian academy. And while Palin might have been seizing an opportunity to "intro kids 2 beauty of laissez-faire," she wasn't just visiting with schoolchildren but was delivering a paid speech at a fund-raiser. Still, however shaky its factual foundations, Palin's highly mediatized cookie showdown was a big rhetorical win. With her unerring feel for the message that travels straight to the American gut, she had come up with new and vivid imagery to make the case that the Obama "nanny state" is, essentially, snatching cookies — i.e., the pursuit of happiness — from the mouths of babes. Suddenly, Pennsylvania's suggestion that schools encourage alternatives to high-sugar sweets became an assault on the American way of life. On freedom and simple pleasures. On wholesome childhood delights and, of course, the integrity of the family.

Glenn Beck, too, has found a winning formula in mocking government efforts to lead Americans to live less fattening lives. His compendium of outrage on the topic waxes long — it includes reports of government health inspectors shutting down a 7-year-old's lemonade stand, for example — and his argument, like Palin's, is clear: the "choice architects" of the Obama administration, he says, believe "you're incapable of making decisions. . . . Left to your own devices, you're going to eat too much, you're going to be a big fat fatty."

At a time when more than two-thirds of American adults are indeed fat (overweight or obese) and 17 percent of children and adolescents are obese, declaring war on unhealthful eating, as the Obama administration has done to an unprecedented extent, could be fraught with political liability. Yet the administration has

essentially tackled the problem as if it were a political no-brainer. Teaching Americans, and children in particular, healthier eating habits seemed so commonsensical a venture, so wholesome and safe, that Michelle Obama chose it for her apolitical personal project as first lady. She has succeeded in enlisting some bipartisan support, and some much-hyped cooperation from the food industry. But now, with antigovernment sentiment resurgent, the cookies are pushing back, like the return of the repressed. And as any homeowner who has ever been advised to bake cookies before showing a house for sale knows, their influence is irrational but real.

For in waging war on fat and sugar, what the administration is doing is taking on central aspects of the American lifestyle. Eating too much, indiscriminately, anywhere, at any time, in response to any and all stimuli, is as central to our freewheeling, mavericky way of being as car cupholders and drive-throughs. You can't change specific eating behavior without addressing that way of life — without changing our culture of food. You need to present healthful eating as a new, desirable, freely chosen expression of the American way.

Perhaps the most successful government effort to regulate what and how much Americans consume — the food rationing programs of World War II — recognized this political-cultural-emotional scheme. Needing a number of foods, meat in particular, for the boys overseas, the government realized that it could successfully spread its message of "eat differently" only if it fought on two fronts: the nutritional and the psychological. And so it pursued a two-pronged campaign, with the Food and Nutrition Board handling the nutrition, and the psychology tasked to the Committee on Food Habits, led by the anthropologist Margaret Mead and charged by the National Research Council with "mobilizing anthropological and psychological insights as they bear upon the whole problem of changing food habits in order to raise the nutritional status of the people of the United States." Eating the way the government wanted you to eat — healthfully and with a mind to greater public welfare — was a way of displaying patriotism, adding to the war effort.

After the war, however, the work of the Committee on Food Habits was discontinued. But the government kept disseminating nutritional advice, with the departments of agriculture and health and human services issuing nutritional guidelines that, in recent decades, have been revised every five years to reflect new and evolving scientific developments. There has, however, been no concerted parallel attempt to create more pointed and sophisticated approaches to changing how Americans think and feel about food. So we ended up with a wealth of knowledge about best nutritional practices but no cultural change to back it up.

And cultural change is what offers the best hope for transforming how and what Americans eat. As noted by David Kessler, the former U.S. Food and Drug Administration commissioner and author of the 2009 book "The End of Overeating: Taking Control of the Insatiable American Appetite," it was a shift in cultural attitudes, not laws or regulations, that led Americans to quit smoking. In the space of a generation, he says, cigarettes stopped being portrayed as "sexy and cool" and started to be seen as "a terribly disgusting, addictive product." Because of the unique emotional power of food, it's hard, if not impossible, to similarly stigmatize unhealthful eating. But it's not inconceivable, Kessler says, that social norms could change: that huge portions, or eating processed foods loaded with sugar, salt and fat, for example, could come to be seen as socially unacceptable.

The task is huge — and not just because of the predictable resistance there would be from the food industry. Largely, it's a question, Kessler says, of breaking old cycles of association: melt-in-the-mouth baked goods with home-safe happiness, for example, or fries with fulfillment — and replacing them with a new circuitry in which, somehow, eating healthfully is self-reinforcing. Can Michelle Obama make field greens and strawberries as comforting, satisfying, and heartwarmingly American as apple pie? She has her work cut out for her.

Judith Warner is the author, most recently, of "We've Got Issues: Children and Parents in the Age of Medication."

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Moved by the Spirit: Celebrating 'Revelations' at 50

By GIA KOURLAS

Andrea Mohin/The New York Times
"Revelations," the signature hit of Alvin Ailey American Dance Theater, turns 50 this year. Above, foreground, the artistic director, Judith Jamison, leads a rehearsal of the last section of the dance. (Fans must be held just so.)

Members of Alvin Ailey American Dance Theater perform "Revelations" nearly as often as ordinary people brush their teeth. This magnificent work, created by Alvin Ailey in 1960, is a dance on land and in water, a journey through African-American spiritual music and, for dancers, an act of reverence for the generations that came before.

"It doesn't matter how tired I am," said Briana Reed, a company member since 1998. "As soon as the music starts, I feel myself transported to another place."

Told in three sections —"Pilgrim of Sorrow," "Take Me to the Water" and "Move, Members, Move" — Ailey's burning exploration of grief and joy celebrates its 50th anniversary on Wednesday at City Center. As part of the season-long commemoration, the troupe's artistic director, Judith Jamison, will conduct performances on Friday and Saturday nights. "It's like a port de bras for me," she said. "It's just so easy to breathe with that music."

Recently Ms. Jamison and a few others fleshed out crucial moments of the dance. "It means the world to me to have done that ballet," she said. "It's a classic work, and it will remain in my body."

'I Been 'Buked' From 'Pilgrim of Sorrow'

Ms. Jamison calls " 'Buked," above, the ultimate prayer. "I always tell the dancers, 'If you're not sweating after you do that, then you haven't done it correctly,' " she said. "That is a hard dance to do, to give it the sense of strain and weight, even if it's just by listening to the words: 'I've been 'buked, and I've been scorned.' That is the weight of the world on shoulders being pulled down into the earth." Such yearning comes to life through the movement — arms outstretched, heads tilted back, the dancers lift their sternums toward the heavens. Masazumi Chaya, the company's associate artistic director, said: "Actually, the movement drops, but I don't want it to really drop. I want the dancers to catch it! And open their hearts to receive it. I tell them to receive that light, and that energy comes through." The dancer Amos J. Machanic Jr., center rear, added: "Life has just beaten you down, but at the same time the words also talk about not giving

up even in the midst of sorrow, even in the midst of a storm. When that music comes on, a sense of calm comes over me, and it reminds me of how badly I wanted to be in the company."

'Processional/Honor, Honor' From 'Take Me to the Water'

In this sacred, joyful section — captured here moments before "Wade in the Water," in which rippling sheets of silk are held across the stage — a woman prepares for her baptism. Linda Celeste Sims, at left, second from right, said: "It's about cleansing and changing and becoming someone better. The beauty of 'Revelations' is that we are all dealing with something, and it doesn't matter what religion or race or nationality we are. We can start to move ahead — not worrying so much about the past, but continuing forward. It's like you're being baptized." For Ms. Jamison, it depicts a serious ritual of the church: "The baptism is one of the holiest events in the church, particularly in the black church, and so being completely submerged in that water and brought up and having a new life is what that is about. In that we see hope."

'Sinner Man' From 'Move, Members, Move'

When Clifton Brown first performed the second variation of "Sinner Man," which showcases three male virtuosos, he loved it as any young dancer would — for its dazzling leaps and pirouettes. (In the photo at right, he is captured in a bison jump that makes it seem as if his body had popped straight into the air.)

"There's also the actual aspect of what's going on: running for your own salvation," Mr. Brown said. "It's Judgment Day, and it needs to have all of that energy and desperation because you don't want to be damned. You're a small part of a huge world or universe because it's something much greater than you — you need to be seen as a frantic being in a huge world." The dancers are, as Ms. Jamison put it, "up against the wall where there is no place to hide."

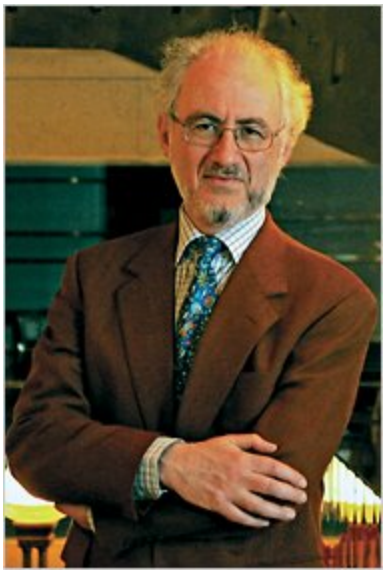
"What an extraordinary work for men!" she continued. "There is a comradeship among them — you see them signaling to each other, pumping up each other backstage. It's wonderful to watch them before they dash out of the wings at full speed and hit that wall, and there's no place to hide. I love watching it."

'Rocka My Soul in the Bosom of Abraham' From 'Move, Members, Move'

Leading up to the finale, "Rocka My Soul," women wear long yellow dresses and matching hats and carry fans. In other words, it's time for church, and it's going to be a hot day. Briana Reed, above, center, who started out in Ailey II, learned "Revelations" from Sylvia Waters, its artistic director, who gave detailed instructions on how to hold the fan. "The pinky finger loops through the hole and then you flip the fan around so that your thumb faces front," Ms. Reed said. "Also, you notice we have our hands on our backs a lot or kind of wrapped around the hip — she was very specific about where that hand and elbow should be: not by your hip, like you're being sassy, but up near your ribs, so that it gives the upper body a more dignified carriage." The section always brings down the house. "You know how the beginning of 'Revelations' is called 'Pilgrim of Sorrow'?" Ms. Reed asked. "For me it's never that — it's heavy, but I don't feel a sense of sorrow. By the end it's joyous relief. People have found a moment, a glimpse of light within all of the hardships. It's a happy time, and there's the sense of just being elated at knowing that there is something bigger than you."

http://www.nytimes.com/2010/11/30/arts/dance/30revelations.html?ref=arts

Celebrating a Man With Many Acolytes
By JAMES R. OESTREICH
WHY MAHLER?
How One Man and Ten Symphonies Changed Our World
By Norman Lebrecht
326 pages. Pantheon Books. $27.95.



Sheng Yun/Lebrecht Music and Arts

Norman Lebrecht

Norman Lebrecht, in his new book, "Why Mahler?: How One Man and Ten Symphonies Changed Our World," speaks of "Mahler's capacity to pierce human defenses." And it is certainly true that Mahler's music can unhinge the susceptible.

Some three decades ago, as classical music editor of High Fidelity magazine, now defunct, I received a manuscript of a Mahler discography from a college professor: a bare catalog of recordings with a brief introduction. Though I recall little else of the introduction, I can still reconstruct its last three paragraphs almost verbatim:

"When the conductor Bruno Walter saw Mahler's coffin lowered into a grave in Vienna, the sun broke through the clouds, and Walter wept. When I visited Mahler's grave, the sun broke through the clouds, and I wept.

"That is why I have undertaken this task. It is the first installment of an impossible debt.

"Gustav Mahler, thou art God."

Mr. Lebrecht, bless him, stops a few paces short of that professor's idolatry. And he turned his fixation, which he dates to 1974, to excellent use with an earlier book, "Mahler Remembered" (W. W. Norton & Company, 1987), consisting mostly of extended quotations from players in Mahler's biography: fellow composers and conductors, singers, family members, acquaintances. But Mr. Lebrecht, too, has difficulty maintaining perspective and a tendency to inject himself into the story.

"Leaving home at 15 is a defining act," he writes of Mahler in the new book. "I left at 16 to study in another country, a foreign language."

"Like Mahler," he adds, "I felt no homesickness, no regret at leaving tragedy and faith behind."

Who, reading a biography of a historical personage, hasn't occasionally identified in some way with the hero? But who does it out loud? A book about Mr. Lebrecht's "search for Gustav Mahler," as he calls his obsession, this is also a book about Mr. Lebrecht, a far less compelling subject.

In addition to the Mahler studies, Mr. Lebrecht has written a half-dozen books on music, including the gleefully apocalyptic "Who Killed Classical Music?" (Birch Lane Press, 1997). Despite the sensationalist title, there is enough life left in the classical music business (about the music itself, we needn't worry) to keep

Mr. Lebrecht busy documenting its further travails in "Slipped Disc," his blog on artsjournal.com, and elsewhere.

In "Why Mahler?" Mr. Lebrecht travels much of the same ground he trod in "Mahler Remembered." Mahler's biography, dispatched there in an introduction, is here heavily laced with snippets of quotations from "Remembered" and elsewhere, and spun out in a breathless historical present as the main body of the book. Although the heavy emphasis on gossip and scandal grows tiresome (however much grist Mahler's wife, Alma, and others may have provided), Mr. Lebrecht writes with flair, at times, and shows a good command of source material.

But to reach the biography, you have to get past a scene-setting chapter, "Some Frequently Asked Questions," which stopped me in my tracks repeatedly. One question is especially revealing: "Am I related to Mahler?" He makes a case for why he might be. Then he abandons the topic abruptly. "Does this make my great-nephew a Mahler?" he asks. "Let's stop this right here."

But some of the other answers are what really take the breath away. Mr. Lebrecht notes that Leonard Bernstein conducted Mahler's Second Symphony ("Resurrection") after the assassination of John F. Kennedy and the Adagietto from the Fifth after that of Robert F. Kennedy. From this and little more, he concludes, "Along with Samuel Barber's Adagio, itself a Mahlerian imitation, Mahler's Second, Fifth and Ninth Symphonies were America's music of lamentation."

No matter that Bernstein trotted out the "Resurrection" for almost any occasion, including his 1,000th concert with the New York Philharmonic, or that if many Americans know the Adagietto at all, it is probably from its use in the Visconti film "Death in Venice" rather than from any occasion of mourning. And the Ninth?

Mr. Lebrecht is projecting his own proclivities here, as he reveals later: "In my occasional role as the Record Doctor on WNYC's 'Soundcheck' show, I have prescribed the finale of the Ninth Symphony and the Adagietto of the Fifth for callers in situations of grief and loss."

In his eagerness to establish irony as a defining quality of Mahler's music, one that defines it in particular as being Jewish, Mr. Lebrecht, as he does so often, goes too far. "Music, before Mahler, had a lexicon of simple emotions: joy, sorrow, love, hate, uplift, downcast, beauty, ugliness and so on." This discounts not only the Wagnerian leitmotif, a tool virtually made for irony, but also any number of poignant, bittersweet moments in Mozartean opera and so much other earlier music.

After flatly stating that Mahler, in his Third and Seventh Symphonies, "hinted at a future ecological disaster" and, in his Sixth, "warned of imminent world war," Mr. Lebrecht backtracks. Some of the connections he makes "are open to debate," he says with — for a change — considerable understatement.

"The opposite," he adds, "as so often in Mahler, may also be true."

What is important to Mr. Lebrecht, it seems, is to make a striking statement in the moment, even if it has to be canceled out a few pages later. In a chapter discussing recordings of Mahler's music, he writes, "The first truth in Mahler interpretation is that there are no absolutes, no hard-and-fast rules." Then, after blasting "conductors who obviate irony," "those who deny emotion" and others, he adds: "There are many no-nos in Mahler: these are just a few of the worst." Accordingly, he dismisses most Mahler recordings in a hard-and-fast word or two.

Mr. Lebrecht can turn a nice phrase at times, as when he speaks of Mahler's plunging "into an oblivion of work." And you never doubt, reading him, that he knows a lot, but he doesn't know everything, as he would have you believe.

His chronic overstatement and striving for effect, a kind of forced informality (he calls Bernstein Lenny, Otto Klemperer Klemp) and a certain looseness in the handling of facts (in quick succession he implies a wrong year for the premiere of Mozart's "Magic Flute" and gives a wrong year for an important dinner party) make it hard to put much faith in any particular pronouncement.

Writing of Alma Mahler, he all but invites comparison with his own work: "Nothing she writes can be accepted without corroboration."

http://www.nytimes.com/2010/11/30/books/30book.html?ref=arts

Building Museums, and a Fresh Arab Identity
By NICOLAI OUROUSSOFF

TDIC/Zayed National Museum
An aerial view of the construction site for the Zayed National Museum in Saadiyaat Island, a development zone in Abu Dhabi.

ABU DHABI, United Arab Emirates — It is an audacious experiment: two small, oil-rich countries in the Middle East are using architecture and art to reshape their national identities virtually overnight, and in the process to redeem the tarnished image of Arabs abroad while showing the way toward a modern society within the boundaries of Islam.

Here, on a barren island on the outskirts of Abu Dhabi, workers have dug the foundations for three colossal museums: an $800 million Frank Gehry-designed branch of the Guggenheim 12 times the size of its New York flagship; a half-billion-dollar outpost of the Louvre by Jean Nouvel; and a showcase for national history by Foster & Partners, the design for which was unveiled on Thursday. And plans are moving ahead for yet another museum, about maritime history, to be designed by Tadao Ando.

Nearly 200 miles across the Persian Gulf, Doha, the capital of Qatar, has been mapping out its own extravagant cultural vision. A Museum of Islamic Art, a bone-white I. M. Pei-designed temple, opened in 2008 and dazzled the international museum establishment. In December the government will open a museum of modern Arab art with a collection that spans the mid-19th-century to the present. Construction has just begun on a museum of Qatari history, also by Mr. Nouvel, and the design for a museum of Orientalist art by the Swiss firm Herzog & de Meuron is to be made public next year.

To a critic traveling through the region, the speed at which museums are being built in Abu Dhabi — and the international brand names attached to some of them — conjured culture-flavored versions of the overwrought real-estate spectacles that famously shaped its fellow emirate, Dubai. By contrast, Doha's vision seemed a more calculated attempt to find a balance between modernization and Islam.

But in both cases leaders also see their construction sprees as part of sweeping efforts to retool their societies for a post-Sept. 11, post-oil world. Their goal is not only to build a more positive image of the Middle East at a time when anti-Islamic sentiment continues to build across Europe and the United States, but also to create a kind of latter-day Silk Road, one on which their countries are powerful cultural and economic hinges between the West and rising powers like India and China.

And they are betting that they can do this without alienating significant parts of the Arab world, which may see in these undertakings the same kind of Western-oriented cosmopolitanism that flourished in places like Cairo and Tehran not so long ago, and that helped fuel the rise of militant fundamentalism.

Building a New Narrative

A little over a half-century ago Abu Dhabi was a Bedouin village with no literary or scientific traditions to speak of, no urban history. Its few thousand inhabitants, mostly poor and illiterate, survived largely on animal herding, fishing and pearl diving.

After oil production began here in the 1960s, Sheik Zayed bin Sultan al-Nahayan, who founded the country by bringing several emirates together under Abu Dhabi's leadership in the early 1970s, made deals with Western oil companies that financed the area's first paved roads, hospitals and schools. The emirates became a kind of Switzerland of the Middle East, a haven of calm and prosperity surrounded by big, aggressive neighbors, Iran and Iraq to the north and Saudi Arabia to the west.

But by the time Sheik Zayed's descendants began coming to power in the 1990s, that low-key approach felt out of date. Globalism was the catchword of the moment, and the construction boom in neighboring Dubai was demonstrating, despite its later bust, how completely a city could transform itself in just a few years.

As important, reliance on economic ties with the West began to seem imprudent after Sept. 11, as Western governments scrutinized all sorts of Arab financial dealings with increasing intensity, and even travel to the West became a sometimes degrading experience for Arabs.

In 2005 Sheikh Zayed's son and heir, Sheik Khalifa bin Zayed al-Nahayan, approached Thomas Krens, who was the director of the Solomon R. Guggenheim Foundation in New York, with the idea of creating a new branch of the Guggenheim Museum — a Middle Eastern version of what Mr. Krens and Mr. Gehry had accomplished a decade earlier in Bilbao, Spain. But the sheik's ambitions were never so small: within a few years the proposed site of the project, Saadiyat Island, a 10-square-mile development zone just north of Abu Dhabi's urban center, was being planned as a miniature city built around culture and leisure, with some of the most recognizable names from the creative world.

Abu Dhabi's blockbuster deal with the Louvre was signed in 2007; another deal, with the British Museum, to design exhibitions for Foster & Partners' Zayed National Museum, was signed two years later. The maritime museum by Mr. Ando and a performing arts center by Zaha Hadid are still being planned. These cultural megaprojects will be joined by a campus of New York University on Saadiyat Island's southern shore and, in a location to be determined, a four-million-square-foot development for media companies and film studios meant partly to provide job training and opportunities for young Emiratis.

Sheik Khalifa and his government want all this to instill national pride in a new generation of Emiratis while providing citizens with tools, both intellectual and psychological, for living in a global society. The idea, several people told me on a recent visit, is to tell a new story, one that breaks with a long history of regional decline, including the recent upheavals caused by militant fundamentalism, and to re-establish a semblance of cultural parity with the West.

"There are religious extremists everywhere in the Middle East — even here," said an Arab consultant who has worked on several developments and spoke on the condition of anonymity for fear of being fired. The sheik, this person said, believes the cosmopolitan influences of the projects may help "open up the minds of these younger Emiratis before they go down that road."

Of all the projects, the Louvre outpost seems the most natural fit with Abu Dhabi's globalist aspirations. On top of a generous construction budget, the government is paying France $1.3 billion, mainly to establish an art-borrowing agreement that will ensure that it gets the pick of the Louvre's encyclopedic collections, as well as art from several other museums. The range and depth of those collections will allow the Louvre Abu Dhabi, which is being marketed as a "universal museum," to show off the cultural achievements of civilizations from every corner of the world.

And Mr. Nouvel's design for this museum — a maze of gallery buildings and canals, all covered by a huge stainless-steel dome — is a wonderfully romantic evocation of a Middle East at ease with technology. Sunlight will penetrate its perforated skin, creating hundreds of beams that recall the interiors of great mosques, or even the filtering of light through the tree canopies in an oasis. Tucked under the dome, the galleries and their watery setting refer to Venice — an emblem, Mr. Nouvel has said, of the fertile cultural crosscurrents that once existed between East and West.

Globalism or Colonialism?

But while the Louvre will be able to draw on thousands of years of shifting cultural influences, the Guggenheim Abu Dhabi, which is focused on 1965 to the present, a period culturally dominated by the West, reveals the problems that arise when the political message you are trying to send collides with historical reality.

Mr. Krens envisioned a "global museum" that nonetheless seemed to acknowledge the primacy of Western contemporary art. The museum — from the outside, a chaotic pileup of translucent cones and gigantic children's building blocks — was organized around a cluster of first-floor galleries representing key movements in Europe and the United States. Islamic collections would be housed two floors above, while warehouselike galleries would radiate out from the core, each devoted to a different region — the Far East, India, Africa. The plan's Western bent didn't fly for the clients, or for Richard Armstrong, who replaced Mr. Krens as the director of the Guggenheim Foundation in 2008.

Nine months ago Mr. Armstrong began developing an alternative plan, in which artists from all over the world would be grouped together in theme galleries: abstract art, Pop Art, performance art and so on. Even in this scheme, however, Mr. Armstrong admits that galleries will end up being organized around major anchor pieces that are, by and large, by blue-chip Western artists like Andy Warhol, Robert Rauschenberg and Anselm Kiefer.

The Guggenheim Abu Dhabi has a team of three curators working in New York to build a collection with a budget of up to $600 million, more than 200 times the annual acquisitions budget of the Guggenheim in Manhattan. But they need to be done in time for the museum's opening in just three years — a time frame that many people in the museum world regard as absurdly short.

Similar issues arose with the plan for the Zayed National Museum, the institution that most directly speaks to the country's identity. The museum was intended to explore the United Arab Emirates' relatively sparse historical record through the life of Sheik Zayed, a man known for his humility, who died in 2004. Yet after Norman Foster presented his initial design proposal, in 2007, he was told that the country's leadership wanted something grander, even though there was still no clear idea of what, exactly, would go inside.

Mr. Foster was sent back to the drawing board, and a team of curators from the British Museum worked out an exhibition program. The new design features an enormous landscaped mound capped by five featherlike wind towers — the tallest one rising 300 feet — an attempt to evoke falconry, a favorite pastime of Arab royals.

That the collections of both the Guggenheim and the National Museum are being planned in the West raises a larger issue: while the money for all these developments comes from Emirati oil, the projects themselves are being shaped almost exclusively by foreigners. Abu Dhabi has become a revolving door of museum directors, architects, curators and other high-level consultants, and the hectic pace at which their plans are being pushed through has contributed to a sense among some here that what is being touted as a societywide embrace of global culture will end up being just another example of cultural colonialism.

The Media Zone will have a similarly strong international flavor. The government hopes that its mix of corporate offices and production studios will attract foreign news companies, as well as Bollywood studios. And an early design — clusters of sleekly contoured towers set atop six superblocks — involved a whole cast of celebrated Western architects, including Bernard Tschumi, Diller Scofidio & Renfro and UNStudio.

Just east of the city's museum district, workers have broken ground on a 27-acre New York University campus, vaguely Beaux-Arts in plan, where classes will be taught in English and where there will be no quotas ensuring that Emiratis or other Arabs are given a significant number of places.

Insiders and Outsiders

The Arab world has been down a similar road. An earlier wave of Western consultants — businessmen, foreign service types, engineers and architects — poured into the Middle East in the 1950s and '60s, selling a cold war brand of modernity that would uplift Arab societies, in particular by fostering a thriving middle class. In practice the changes often simply reinforced divisions between a privileged elite — modern, educated, in tune with the West — and a struggling underclass, something that was not a small factor in the rise of fundamentalist violence.

No one would claim that a country as small and rich as the United Arab Emirates has the same combustible mix of social problems as, say, Egypt or Iran, but there are obvious echoes when you consider whom these cultural megaprojects will probably serve.

The new museums will be embedded in a kind of suburban opulence that can be found all over the Middle East, but rarely in such isolation and on such an expansive scale as in Abu Dhabi. The concrete frames of a new St. Regis hotel and resort and a Park Hyatt are rising just down the coast from the museum district, along Saadiyat Beach. Nearby, a 2,000-home walled community is going up along an 18-hole golf course designed by Gary Player, to be joined eventually by several more luxury residential developments and two marinas for hundreds of yachts. A tram will loop around Saadiyat, connecting these developments to the museums.
As telling, in its way, is the Workers' Village that I was taken to see during a tour of the island. The camp, still under construction, is expected to house 40,000 foreigners brought in to build this paradise.
It is neatly divided into three-story prefabricated housing blocks, which are interspersed with pretty courtyards. A two-story structure, just off one of the courtyards, serves as a communal hall, with dining on the ground floor and a library upstairs with books arranged by language: Arabic, Hindi, Nepalese, Tamil, Malaysian. The same languages blare from TV rooms off a balcony.
In some sense this village embodies a version of the cosmopolitanism Abu Dhabi says it is trying to create. But even if it is completed as planned, it will house only a small fraction of the city's hundreds of thousands of migrant laborers; the rest will presumably live in cramped quarters in the city's industrial sector or in faraway desert encampments. And once the museums are completed, a spokesman for the government development agency told me, it will be bulldozed to make room for more hotels and luxury housing.

Arabic Tradition in Qatar

Doha, like Abu Dhabi, was built from a small trading village into a city of about a million in the last 50 years. But both the museums being built around Doha and the art and artifacts to which they are dedicated — private collections amassed over decades by members of the ruling family — reflect a more patient, gradual approach to culture building than that of Abu Dhabi, and one that looks less to the West. If the cultural identities that both cities are trying to create are to some extent fictions, Doha's is one woven largely of the cosmopolitan traditions of the region — that is, of places like Damascus, Istanbul and Cairo.
The three major Qatari national collections were assembled by the emir's cousins Sheik Hassan al-Thani and Sheik Saud al-Thani, who began collecting in the 1980s, when art was still viewed as dubious, even unmanly, among the country's elites.
"If I talked about modern art, no one understood me," Sheik Hassan told me when we met in Doha. "It was impossible to even start this conversation."
In the 1990s a new emir, Sheik Hamad bin Khalifa al-Thani, began to liberalize many institutions and to open the door cautiously to the outside world. In 1995 he announced plans for Education City: a sprawling campus whose programs are now run by American universities like Texas A&M and Georgetown, but with agreements to ensure that a large proportion of its students are Qatari nationals. A year later he established the news network Al Jazeera.
The museum projects were also part of this liberalization effort. After Sheik Saud agreed to donate his collection of Islamic art to the state, Sheik Hamad hired Mr. Pei to design a building for it. When the resulting Museum of Islamic Art opened, it was celebrated as a successful Modernist interpretation of Islamic precedents, from the ablution fountain of the Ibn Tulun mosque in Cairo to old Islamic fortresses in North Africa. Its monumental forms express Mr. Pei's ideal of a world in which modernity and tradition exist in perfect balance.
As striking as Mr. Pei's architecture, however, was the obvious subtext of the collection, whose treasures range from Iraqi ceramics to Spanish silk curtains and Indian jewelry. If these pieces were assembled with an eye to exploring the richness of Islamic art — and the historic reach of Islam — their presentation was also a way to emphasize the cultural crosscurrents that produced them. The message, directed at both local and foreign audiences, is that much of what is great in Western, Eastern and Middle Eastern traditions is based on their connections to one another.
"My father often says, in order to have peace, we need to first respect each other's cultures," said Sheika al-Mayassa Bint Hamad Al Thani, the emir's 28-year-old daughter and the main force behind the museum building program in Qatar. "And people in the West don't understand the Middle East. They come with bin Laden in their heads."
The museums, she hopes, will help "to change that mind-set."
The newer national collections, parts of which will be unveiled to the public over the next few months, will take that idea into more provocative territory. The Orientalism collection in particular seems like an

improbable focus for a museum in the Arab world. The collection, displayed in a town house until its new home is completed, centers on depictions of Arab life by 19th-century French and English artists. In one room a caricature of a squatting North African warrior hangs near a painting of Algerian women performing a seductive dance. There are also portraits of sultans and pashas by Italian artists, extending back to the 16th century, when the cultural scales were tipping away from the Ottoman Empire and toward Renaissance Europe.

To a Westerner, the 19th-century paintings can be especially uncomfortable — they present what now seem clichés of Arab life that reflect back our own prejudices. But to many Arabs they are also vividly detailed historical records of a period that is otherwise undocumented. Realistic painting did not exist then in the Arab world; photography was not common until the late 19th century. As Sheik Hassan saw it when he was building the collection, these were the only records of a life that was fast fading from memory.

"I recognize this life," Sheik Hassan said. "The sheik sitting in his tent, I know these costumes are 100 percent right — even the tint of the button. The hare, it is from North Africa."

The paintings are not simply relics of cultural imperialism, he added. "You should think of all of this as part of a cultural movement, an exchange of ideas."

Still, by shining a light into the darker corners of Arab history, as well as at its ancient glories, the Orientalist museum suggests an understanding — rare anywhere — that the foundations of any healthy culture must be built on an unflinching appraisal of the past. Rather than airbrush that past, the government intends to put it up to public scrutiny.

A similar impulse is shaping Mathaf: Arab Museum of Modern Art, which will open in a temporary home at the end of December. When I first visited the collection, which was still in storage, I felt the weight of the West's cultural influence in frequent derivative references to artists like Picasso. Just as many works, however, were inspired expressions of the artist's struggle to come to terms with that influence without losing touch with his or her own identity.

Piecing together the fragments of that 20th-century history and linking them to present-day Qatar will be one of the museum's core missions, said Wassan al-Khudhairi, its Iraqi-born director, as she gave a tour of the rooms. "Baghdad, Cairo, Beirut, North Africa, Syria, Jordan," she said. "This is the culture."

Not that Doha is overlooking its own less glamorous past. In contrast to Mr. Foster's evocation of the sport of Arabian kings in Abu Dhabi's National Museum, Mr. Nouvel's design for the Qatar National Museum draws on the forms of local sand roses: tiny pink encrustations buried just under the desert's surface. The building will be composed of clusters of concrete discs that seem to have tumbled across the site, gently encircling a palm-shaded courtyard. Inside, displays of tents, fabrics, saddles and other objects, as well as enormous video screens that will immerse the visitor in the experience of the desert, are meant to convey both the humble origins of Qatar's royal family and the nobility of Bedouin life.

Like all of Doha's new cultural buildings, the National Museum is being carefully integrated into the city, rather than set apart in a special zone. It will be built within the boundaries of the original settlement, now the city's center, on the site of an early-20th-century palace of a former emir. Mr. Pei's Museum of Islamic Art, though on a man-made island, stands just off the corniche, not far from the old souks. The government is considering several downtown sites for the permanent home of Mathaf.

Radical Social Transformation

Doha's methodical approach to culture building is echoed in an even broader plan to re-engineer the demographics of the city, according to Stan Wypych, an Australian consultant for the city's planning authority. The population of Doha is expected to grow to 2.3 million by 2032. By then, with the current construction boom over, the bulk of its 700,000 laborers, mostly from South and Southeast Asia, will have gone home, replaced, the government hopes, with the kind of educated, white-collar workers whom it sees as the future of the new society.

Some of these new professionals would be housed in places like Lusail City, a 14-square-mile district of apartment towers, villas and marinas under construction at the city's edge. Other developments, designed with more traditional courtyards and within walking distance of mosques or plazas, are being marketed to Arabs, including Qataris who fled the city to suburban villas decades ago, as part of an effort to entice them to the historic city center. The idea is to integrate the new expatriates without sacrificing Doha's Arab character.

"The social transformation is pretty radical," Mr. Wypych said. "It's happening pretty fast."

As comprehensive as this vision seems, however, questions still linger, as in Abu Dhabi, about whom it will speak to. Few fundamentalists are likely to distinguish between one approach to modernization and another. Even many educated Arabs in and outside Qatar — among the museums' target audience — see a disturbing inconsistency in these grand plans.

"Some have lived here 50 years," said Fares Braizat, a Jordanian professor at Qatar University who has been working on a census of foreign nationals. "They speak Arabic with a Qatari dialect, but they are still not allowed Qatari citizenship" or any of the enviable perks that go with it: free education and health care, interest-free government loans, preference in hiring, a sense of equality.

Mr. Braizat's point zeroes in on what could turn out to be the great flaw in the plans of both cities. Leaders are investing enormous amounts in these projects, and they are likely to leave behind some extraordinary buildings and institutions. But if they can't get over that final hurdle and persuade enough people that they have a shared stake in this future, they will never realize their most ambitious goals. Worse, they may end up reinforcing the cynicism about engagement with the West that brought down Western-style modernism in this part of the world decades ago.

http://www.nytimes.com/2010/11/27/arts/design/27museums.html?ref=design

Africa and Its Spheres of Influence
By JUDITH H. DOBRZYNSKI

Joshua Bright for The New York Times
A dress designed by Duro Olowu.

IT was late September, and Lowery Stokes Sims, a curator at the Museum of Arts and Design, was on the phone in her small white office, working out the shipping details for a piece in "The Global Africa Project," which opened on Nov. 17. Through her window, the giant silver globe in Columbus Circle glistened.

How apt. As she conceived the exhibition, Ms. Sims wanted to stress the "global" far more than the "Africa." Yes, she and her co-organizer, Leslie King-Hammond, director of the Center for Race and Culture at the Maryland Institute College of Art, chose artists who are African or of African descent, no matter where they were born. "Africa exists wherever these people are," Ms. Sims said.

But they also picked artists like Janet Goldner, an American sculptor of Eastern European descent who draws on her frequent travels to Africa, and the jewelry maker Ruth Omabegho, a native New Yorker who has lived in Lagos since the 1970s with her Nigerian husband, Billy, a sculptor whose works are also in the exhibition. And they selected artists who've reached across the ocean for partners, like Algernon Miller. Based in Harlem, Mr. Miller strung about 110,000 paper beads, made by a women's cooperative in Uganda, into a wall tapestry. He's never met the 40 women who made the beads; his contact has been over the phone and the Internet.

Most of the exhibition — more than 250 works made by 107 artists and collectives — is devoted to jewelry, textiles, furniture, architecture, fashion, ceramics and basketry. But as Ms. Sims was organizing the show, she decided to include a sprinkling of photography, painting, sculpture and installation work too, in the belief that the line separating design and art is increasingly blurry.

The resulting visual farrago, a combination of traditional crafts, sophisticated urban design, fine art and much in between, is meant to make a point: African influence, itself infused with the cultures of colonial powers, has affected the world of art and design internationally, in ways both obvious and subtle.

This interactive feature provides a look at five artists in the exhibition.

Duro Olowu

Born in Lagos to a Nigerian father and Jamaican mother, Duro Olowu became a lawyer in London, where he lives, and is married to Thelma Golden, a New Yorker who is the director of the Studio Museum in Harlem. Deciding that fashion, not law, was his métier, Mr. Olowu introduced his first collection in 2005. Colorful, elegant and chic, it created a fashion flurry, and one dress in particular won him wide acclaim: the high-

waisted, wide-sleeved Duro dress, confected from printed georgette and vintage printed silk jacquard for trim. “I re-invented freedom and joie de vivre in an African way, a wearable way,” he said of the dress. Mr. Olowu’s signature is his mix of patterns, colors and shapes — on display in a flowing “Black Orpheus” gown in the exhibition, which blends paisley, polka-dot and floral prints, cut on the bias and trimmed with ruffles. The resulting cacophony is very African, where such a profusion signifies wealth and prestige. “This is how women wear clothes in contemporary Africa,” he said. “They may wear traditional clothes, but then they may mix it up with a Gucci scarf. You’ll see chintz curtains mixed with African design. It’s an offbeat strong aesthetic that influences my work.”

Daniele Tamagni

Daniele Tamagni was a freelance photographer, on assignment for the Italian magazine Africa, when in 2007 he discovered a group of Congolese men, members of the Society for the Advancement of People of Elegance, dressed to the nines in tailored, brightly hued suits. They mixed a hot pink suit with a red bowler hat, say, or a snow-white suit with a brilliant turquoise shirt. Given the contrast with the poverty around them, Mr.Tamagni said, “I was surprised to see these looks. I come from Milan, and I was interested in fashion, fascinated by their style.” He decided to approach one of them, who introduced him to others in the group. They allowed Mr.Tamagni to take their pictures. In2008 he returned to Congo, taking more photographs. He has published a book of the images, “Gentlemen of Bacongo,” and has had exhibitions of the photographs. What Mr. Tamagni uncovered along the way was a subculture.” Some people think they are jokers, not serious people,” he said. “But some appreciate the fact that they succeeded at this. They are popular because they are like actors. They’re invited to parties because they give an elegant look to them. They’re paid to go, like special guests, for weddings, funerals and birthday parties.”

Ndidi Ekubia

The graceful, beaten silver bowls and vases of Ndidi Ekubia betray no obvious links to Africa. But Ms. Ekubia, born in Manchester, England, and now living in London, said she draws inspiration from her mother, who emigrated from Nigeria in the late 1960s, from “the stories she used to tell and what she said about the life she lived in Africa,” from her African dress and from the “bits of wooden furniture” and other objects around her childhood home that came from Africa. African food, bright colors, fashion, language and what she called the “boldness of the African people” have all had their effect. “My work is quite emotional, and the character is quite strong,” she said. “Africans in general are emotional people. They cry. They talk loud. African dress is quite loud.” To make her pieces Ms. Ekubia hand shapes steel or wooden forms, making molds that often have a natural, organic feel. Then, she will set them aside for a while before returning to cover them in silver sheets. Using special hammers she beats the silver into place on the forms. “This is hard work,” she said, again evoking “a connection to my African background,” adding, “I watched my mother work so hard in this country.” Each one can take weeks or months to complete.

Bibi Seck

The bright table and stools de-signed by Bibi Seck are made in Senegal, where recycling plastic is common. It’s collected, cleaned with detergent, shredded and reprocessed into new multicolored products. Or, to geta pure blue or red product, say, the plastic must be separated be-fore cleaning. Using that recycling tradition, R. Sack — who was born in Paris to a Senegalese family but spent 10 years of his youth in Dakar — created his “Taboo” furniture line. Intended primarily for users in Western Africa who traditionally sit on low stools around tables to eat, drink and talk, his pieces are made in Senegal by a local work force that can turn out 60 stools a day. Eventually the line will be sold in the United States and Europe. Mr. Seck’s Taboo furniture, Bibi Swhich comes in colors like turquoise blue, sea green and coral, has a playful sense. But Mr. Seck is a consumer designer to the core, always concerned with how the user will react to his work and use it. “The day the user is alone with our product they need to feel that someone took good care of them,” he wrote in his artist’s statement for the Global Africa Project catalog. “What makes it African is the source,” said Mr. Seck, who regularly travels to Senegal but has a New York-based commercial design firm with his wife. Those products “are not African, even if I am the designer,’’ he said. “I bring my certain sensibilities to it, but it’s

not based on where I grew up or who was my father. It's more everything I've gone through since I was born."

Kim Schmahmann
Kim Schmahmann grew up in South Africa during apartheid, and his piece in the exhibition, "Apart-Hate: A People Divider," reflects on the horrors of that era. Seen from afar it's a striking marquetry room divider in warm wood tones — "eye candy," he called it. Up close it's an image of a world falling apart, a meditation on discrimination. The piece grew out of a gift, of sorts, from two South African women. Noting that Mr. Schmahmannhad incorporated documents in an earlier work, they presented him with their pass books, the papers that black South Africans had to possess outside designated black areas. "It took me five years to work out how to do this without glorifying the passbook," he said. That was five years ago, and he's been working on the interconnected, three-section divider Kim Schmever since. In the divider's first screen two wood panels depict the huge Voortrekker Monument in Pretoria, which honors the Boers who moved deep into South Africa, and the unraveling of the legal building blocks of apartheid. In the center screen newspaper accounts, images and other documentation of daily life under apartheid are displayed on a white grid. The third, a black grid incorporating a barbed wire frame, holds the pass books. "When people build walls that separate people, they cause suffering," said Mr. Schmahmann, who left South Africa for Cambridge, Mass.,20 years ago. "Those that are discriminated against suffer, but those that practice discrimination also lose out in a different way."

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The Public Warhol in a Public Square
By CAROL VOGEL

Public Art Fund
A rendering of Rob Pruitt's "Andy Monument," a Public Art Fund project to be installed in Union Square in the spring.

Although winter hasn't even started, there is already a lineup of public art projects scheduled for New York this spring. The Public Art Fund will be installing three sculpture exhibitions: at Union Square, City Hall Park and Doris C. Freedman Plaza, at Fifth Avenue and 60th Street.
"These aren't site-specific installations; they are site-responsive," said Nicholas Baume, director and chief curator of the Public Art Fund, the nonprofit organization that presents art around the city. "They are all linked because they use New York City as a context."
Perhaps the most surprising will be a 10-foot-tall bronze sculpture of Andy Warhol in Union Square (March 30 to Oct. 2). This will be only the second time the Public Art Fund has installed art there: the last project was "Woman's Work" in 1993, the artist Rhonda Roland Shearer's eight bronze sculptures of women scrubbing toilets, vacuuming and shopping for groceries while clutching squirming children to their bosoms.
But the New York artist Rob Pruitt chose this bustling area for the Warhol sculpture, called "The Andy Monument." He had a particular corner in mind, at 17th Street and Broadway, just outside the building that once housed Warhol's Factory. The sculpture depicts Warhol as he looked in the 1970s, in his signature fright wig, blue jeans and a tweed jacket. He is posed with a camera around his neck, carrying a shopping bag full of issues of Interview magazine, the publication he helped found.
"It's conceived as a classical monument although it's very contemporary," Mr. Baume said. "It's a real public Andy from the period where he would stand in Union Square giving out the magazines."
By contrast, the London-based sculptor Eva Rothschild has claimed the plaza at the entrance to Central Park for a delicate work that she said would take "the form of a multidirectional arch." The piece, which will be on view March 1 to Aug. 28, will rise nearly 20 feet and spill over the center of the plaza. Fashioned from red, green and black steel tubing four inches in diameter, it will echo the branches of trees in the park and be, as Ms. Rothschild put it, "another gateway between two different worlds of urban experience."
Back downtown, in City Hall Park, more than 20 sculptures by Sol LeWitt will be installed from May 25 through Dec. 2. LeWitt, who died in 2007, was known for his Minimalist geometric work, and Mr. Baume has

assembled large-scale pieces dating from the 1960s through 2006, including many that will be seen in this country for the first time. They will come from private collections and museums both here and abroad.
"There hasn't been a career overview of his structures," Mr. Baume said.

FLORENCE: HIRST'S 'SKULL'

In 2007, when Damien Hirst's "For the Love of God" first went on view at the White Cube Gallery in London, crowds with timed tickets lined up to see the piece, a human skull cast in platinum and covered with 8,601 diamonds. The work has been shown only once since, at the Rijksmuseum in Amsterdam two years ago.
Now the sculpture, which was reportedly bought by a consortium of investors that includes the artist himself, is making another public appearance, this time at the Palazzo Vecchio in Florence, once the residence and ducal court of Cosimo I de' Medici in the 16th century. The skull went on view Thursday and will be on display through May 1.
"The city is pretty illiterate when it comes to contemporary art," said Francesco Bonami, the Italian curator who has masterminded the exhibition on behalf of the Arthemisia Group, show organizers in Milan better known for putting together old master and Modern art exhibitions in Italy. "The mayor of Florence asked me to do something with contemporary art in the city."
To Mr. Bonami, one of the curators of this year's edition of the Whitney Biennial, seeing Mr. Hirst's celebrated skull in the palazzo setting makes sense. "The work has some of the aura of great Renaissance objects by the Medici, like the gold salt dispenser by Benvenuto Cellini and other masterpieces of jewelry and sculpture," he said. "We think it's the perfect spot."

LAS VEGAS: ART MACHINES

There won't be any standing behind ropes to see the art at the Cosmopolitan, the new 2,995-room hotel and casino scheduled to open in Las Vegas on Dec. 15. Nor will there be any Rembrandts or Picassos or Monets on view. The place is being filled with all kinds of contemporary art, including light sculptures and constantly changing videos on its marquee, as well as inside the lobby. Guests can even watch work being made by artists in residence.
"It's very Boom Boom Room," said Doreen Remen, who, with Yvonne Force Villareal, runs the Art Production Fund in New York. Together they helped organize the hotel and casino's smorgasbord of art. Ms. Remen was referring to the flashy penthouse of the Standard hotel in the New York meatpacking district that has become a hot spot for celebrity sightings and parties. "It has that same kind of fun and glamour," she added.
The parking garages will also have art, in this case graffiti by names like Shepard Fairey and Kenny Scharf. And Clark Whittington, an artist from Winston-Salem, N.C., is planning to install six Art-o-mats, cigarette machines refashioned to dispense art. The machines, which first popped up in the '90s, are stocked with original pieces of art submitted by a network of more than 400 emerging artists from around the world. Patrons pay anywhere from $5 to $20 for a token for the coin slot and in return receive a small work of art.
"Oftentimes it is the first piece of art an artist sells," John Unwin, the Cosmopolitan's chief executive officer, said in a telephone interview.
"It's meant to be fun," Mr. Unwin added, speaking of all the Cosmopolitan's art. "It's Las Vegas. It helps create stories for people to tell."

http://www.nytimes.com/2010/11/26/arts/design/26vogel.html?ref=design

From the Former Eastern Bloc, Wielding Color
By SUSAN HODARA

Leonardo Silaghi
ON WHEELS "Untitled #10349," oil on canvas, 2010.

SOON after entering the common studio space at the Universitatea de Arta si Design in Cluj Napoca, Romania, Livia Straus spotted a dreadlocked young man working alone in a corner. "All of his canvases were facing the wall," recalled Ms. Straus, the director and co-founder with her husband, Dr. Marc Straus, of the Hudson Valley Center for Contemporary Art in Peekskill. "And, of course, if a canvas is facing the wall, I want to see it."

What she and Dr. Straus saw when the artist began turning his paintings around impressed them enough to invite him to spend three months as an artist-in-residence at the art center. A year and a half later, the results of that residency, which took place this summer, are on view in "Leonardo Silaghi," an exhibition of large-scale paintings by the 23-year-old Mr. Silaghi.

The nine works in the exhibition, all oil on canvas and all but one measuring an imposing 84 by 120 inches, represent both a continuation of and a departure from the artist's previous work. In Romania, Mr. Silaghi was painting commercial vehicles reminiscent of the post-World War II industrial era in Eastern Europe; he used a palette exclusively of shades of gray.

In this show the paintings are still of vehicles, but they include a racecar and go-kart derived from photographs taken during a visit to the Monticello Motor Club upstate, and a truck under an overpass inspired by the construction along Route 9 in Peekskill.

And there's color: blue highlighting a three-wheeled motorcycle, splotches of yellow bouncing off the hood of a rickety bus. "I started to gamble with color," Mr. Silaghi said from Romania via telephone.

Consistent with his earlier work, the landscapes in "Leonardo Silaghi" are devoid of people, but Mr. Silaghi has endowed his machines with personality. "He was adamant about his vehicles replacing the human figure," said Jessica Denaro, the center's deputy director. "He gives the attributes he sees in people to his vehicles — not literally but in a more organic way."

Perhaps reflective of those attributes are certain off-kilter elements in each piece — "especially the wheels," Ms. Straus said. "They never quite line up."

Mr. Silaghi is the first of three artists-in-residence to come to the center during the run of its larger exhibition, "After the Fall," a show of Central and Eastern European artists who were born during the Communist era and educated after its collapse. "In 'After the Fall,' " Ms. Straus said, "many of the pieces have a kind of grayness, a heaviness. In Leo's work, there's gray, but there's not the same heaviness. He's the next generation."

"Leonardo Silaghi" is on view through Dec. 19 in the mezzanine gallery at the Hudson Valley Center for Contemporary Art, 1701 Main Street. Information: hvcca.org or (914) 788-0100.

http://www.nytimes.com/2010/11/28/nyregion/28spotwe.html?ref=design

Art That's Best Seen Through the Bottom of a Glass
By FRANK BRUNI

Eirini Vourloumis for The New York Times
Culturefix is a combination bar and gallery on the Lower East Side.

With notable exceptions like long-distance running, any-distance driving and matters of personal hygiene involving sharp blades, most activities go down easier and happier with a drink in hand.

This certainly applies to the viewing of art, which can otherwise be too passive an affair — at least for me. It's safe to say that if museums permitted visitors to tote stiff, cold gin martinis, I'd be a veritable squatter at the Louvre and on infinitely more intimate terms with Michelangelo.

Alas, they don't. But Culturefix, a combination bar and gallery on the Lower East Side, does. It won't let you gaze upon art with a martini per se, but that's just because its liquor license covers only beer and wine. So perhaps a glass of grüner veltliner or a stein of German ale is what you'll carry as you wander from the front of this multichambered, multicharmed establishment to the back, where the paintings (or whatever else Culturefix is displaying) hang.

Spirits have long been a big part of spectator sports. Of live music, too. But apart from the perfunctory pinot grigio at many a small-circle gallery opening, the integration of cocktails and chiaroscuro isn't nearly as routine. Maybe that's best. Red wine stains aren't the easiest to remove, and it would be a shame to lose a masterpiece to a merlot.

Even so, there have long been scattered opportunities around town to have your art and drink to it too — in a fashion. While the King Cole Bar in the St. Regis New York hotel is first and foremost a watering hole, it is defined, really, by the "Old King Cole" mural, painted by Maxfield Parrish in 1906 and treated to a $100,000 restoration just three years ago.

There are also murals — entrancing, wraparound ones — at both of the magazine editor Graydon Carter's Manhattan restaurants, the Waverly Inn in the Village and the Monkey Bar in Midtown.

And a wraparound mural is what all those drawings by the illustrator of the Madeline books add up to at Bemelmans Bar, on the Upper East Side. But in a room so dark, they essentially play the role of wallpaper, the visual equivalent of ambient noise.

Besides, I get the sense that few Bemelmans bons vivants notice them, just as I too infrequently hear people who have been to the Rose Bar in the Gramercy Park Hotel rave about the art in and around it, by Andy Warhol, Julian Schnabel, Jean-Michel Basquiat. Rose Bar is essentially a liquid gallery that gets credit for the liquid part only, and maybe for the velvet upholstery and chessboard floor as well.

So I was intrigued to hear about the opening this year of two bars on the Lower East Side that conceived of — and advertised — themselves as spaces for the exhibition of art too. Culturefix is one; the other is called Panda.

I hit Panda, on Chrystie Street, first. It's a raw, ramshackle place that looks sort of thrown together and half-baked. I don't mean grunge chic; I mean just grunge.

The small bar in front stocks hard liquor as well as beer and wine, but doesn't have an extensive or inspired selection of any of those. I took a chance on the red sangria, figuring an operation this modest wouldn't bother with sangria if it didn't have a tasty trick up its sleeve. I figured wrong.

And yet I wasn't unhappy here. That I could take my sangria for a walk —and that the walk could lead to a back area with ample elbow room — were pleasing anomalies in space-crunched Manhattan. In that back area I unhurriedly examined about a half-dozen paintings, including two portraits of black women with majestic presences by an artist named Francis Simeni. I also gazed upon a pink neon L-O-V-E sign in which the L and O weren't illuminated.

"What's the significance of that?" I asked the bartender, who had left his post and was ambling around. I tried to sound all thoughtful and art critic-y.

"It's just broken," he said. "And it's not art. The artists keep asking us to get rid of it, because people keep making that mistake."

Culturefix is on Clinton Street, and it's a more composed affair through and through, opened by two refugees from Jeffrey Chodorow's restaurant empire: Ari Stern, 33, who worked as a chef, and Cole Schaffer, 25, who worked as a manager.

Their wine choices aren't utterly obvious — there's a Côte de Gascogne blanc, for example, by the glass, for $6 — and the beer selection is even more interesting, with more than half of the dozen choices ($4 to $9) brewed in New York State. Mr. Stern also executes a limited menu of small plates ($4 to $12), including braised pork cheek and roast duck, and occasionally converts the bar into a dining room for a multicourse chefs menu he calls Dinnerfix. It is announced about a week in advance on the Culturefixny.com Web site and Facebook page, and costs anywhere from $50 to $150, depending on ambition and theme.

To reach the rear gallery space, which is furnished with tables, chairs and a long couch, you walk up a festively painted ramp from the bar. This back area is used for a variety of musical and culinary events and private parties; on the night I stopped by, there were about eight people taking a "Joy of Cheese" seminar. Their high-lactose chatter formed an aural backdrop to my perusal of nearly 20 painting and drawings by about a dozen artists, one of whom really got under my skin. His name is Geoffrey Carter, he works with charcoal and graphite on paper, and his vaguely deformed, archaic characters and lugubrious landscapes might well be labeled prairie macabre. I was riveted, unsettled and glad I had that Gascogne blanc to steady my nerves.

Up another ramp, back in the direction of the street, is a store connected to the bar and gallery. Called Dijitalfix, it's a new outpost of an established Williamsburg, Brooklyn, business that sells whimsically designed desk and office paraphernalia, unusual calendars and electronics accessories with as much of a premium on design as on function.

Its manager, Ruth Gruca, is an evening's entertainment all her own, so quickly and deftly does she extrapolate and celebrate the virtues of any item you touch, pause over or comment on.

I admired a camera.

"It's really exciting!" she chirped.

I said a computer bag was handsome.

"And it's really durable," she added, within a nanosecond.

My companion said a pair of headphones was shockingly comfortable.

"They're like feathers," Ms. Gruca marveled. "They're like La-Z boy chairs for your ears."

Then she really got our attention, informing us that any purchase in the store meant a free drink from the bar. I bought a BlackBerry accessory and some ridiculously fancy alternatives to Post-It notes, totaling about $35. These two items meant two free drinks, a value of $15.

And in this store my wineglass was welcome: I sipped as I browsed. What do you know? Shopping turns out to be yet another activity abetted and enhanced by a tipple.

Drinks With a View
BEMELMANS BAR 35 East 76th Street, Manhattan; (212) 744-1600, thecarlyle.com/dine4.cfm.
CULTUREFIX 9 Clinton Street, near East Houston Street, Lower East Side; (646) 863-7171, culturefixny.com.
KING COLE BAR St. Regis Hotel, 2 East 55th Street, Manhattan; (212) 339-6857, kingcolebar.com.
MONKEY BAR 60 East 54th Street, Manhattan; (212) 308-2950, monkeybarnewyork.com.
PANDA 139 Chrystie Street, between Delancey and Broome Streets, Lower East Side; (212) 334-6770, thepandanyc.com.
ROSE BAR Gramercy Park Hotel, 2 Lexington Avenue, at 22nd Street; (212) 920-3300, gramercyparkhotel.com/bars.html.
WAVERLY INN 16 Bank Street, at Waverly Place, Greenwich Village; (917) 828-1154.

http://www.nytimes.com/2010/11/26/dining/26tipsy.html?ref=design

Fruitful Talent Who Made Art World Multiply

By HOLLAND COTTER

Fred R. Conrad/The New York Times
"Robert Rauschenberg," a survey at Gagosian Gallery, includes "Palladian Xmas" (1980), with acrylic, fabric and collage on wood

Robert Rauschenberg, the subject of a chock-a-block time capsule of a show at Gagosian Gallery in Chelsea, was an optimist and a doer. He not only did what artists normally do: make paintings, sculptures, prints and photographs. He also did the work of performers, musicians, philanthropists and career politicians.

He danced, composed, gave away money and initiated diplomatic missions, always on behalf of art. He believed that if he, or we, or anyone could just produce enough art, then art and life would be the same thing, and the world would change for the better. So, committed universal citizen that he was, he kept trying to make enough.

He made a lot. He was blessed with sunny energy, immense talent and an unstoppable creative flow, the equivalent of stream of consciousness in literature. For years on end, that stream rushed forward, turning whatever it swept up — childhood memories, art history, street junk, nature, the daily news — into gold. Then for stretches, and quite lengthy ones, it meandered and pooled. Even then, the flow never stopped. In a six-decade career, Rauschenberg turned out more than 6,000 works of art, some of preposterous size and ambition.

Gagosian Gallery thinks big too, and bigger than usual in its series of museum-style exhibitions in Chelsea over the last few years. In early 2009 there was a Piero Manzoni survey. No one knew it was coming, and there it was, a knockout, invaluable, a reminder of all the artists we should be looking at and aren't. A year later, in what felt like another miracle of spontaneous generation, we got late Monet, an artist we look at very often, but rarely, as here, in sunset light. "Robert Rauschenberg," with 49 works dating from 1950 to 2007, the year before the artist's death, is on the same scale as those shows, but different. For one thing, it doesn't come out of nowhere: it follows hard on the news that Gagosian, in a commercial coup, would be handling the

Rauschenberg estate. For another, most of what's in the exhibition is for sale, which wasn't the case with Manzoni or Monet.

So we have a career survey that's also a marketing event, with negotiable values in terms of both dollars and critical status on its mind. Ideally, this shouldn't affect the way we see art, but it does. In a museum, or even a no-sale gallery show, we're looking at done-deal stuff, art with values fixed, economic histories at least temporarily closed. In the Rauschenberg show, we're in the presence of deals being done. So the psychological dynamic is different. As we walk through the gallery, we can still ask the question: how is this work holding up? The decisions are still being made.

This is not to say you can't take what's here simply as prime historical data. You can, and as such, it's rich. One of the earliest pieces, "Short Circuit (Combine Painting)," is a time capsule unto itself. It dates from 1955, when Rauschenberg was represented by Stable Gallery. Every year the gallery did a big group show to which new artists were invited. Rauschenberg recommended four: Jasper Johns, Ray Johnson, Stan VanDerBeek and Susan Weil. When the gallery said no, he decided to get them in, anyway, by inserting a work by each inside his own contribution, a cabinet-shaped construction with a hinged door.

Only Mr. Johns and Ms. Weil, Rauschenberg's ex-wife, came through with work on time, so into the cabinet went a little painting by each And, with one significant change, those two paintings are still there: Mr. Johns's picture, a mini-version of one of his soon-to-be famous flag images, was stolen in 1965 and replaced by an Elaine Sturtevant copy.

"Short Circuit" is a sweet reminder of Rauschenberg's collegial generosity; he believed in art making as a communal endeavor, and acted on that belief. At the same time, the piece is a souvenir of an astonishingly fruitful period both in American art and in his own hyperkinetic career.

By 1955, some of his most radical work was already behind him: the all-white paintings, the all-black paintings, the "Elemental Sculptures" made from street finds. Gagosian has examples of all of these. By then Rauschenberg had designed stage sets for Merce Cunningham, performed with John Cage and invented the first of his "combines," the hybrids of painting, collage and sculpture that would become his signature form. Most major combines from the 1950s and '60s have long since been secured by museums, but there are a few examples here, like "Dylaby (Combine Painting)," from 1962, with its stained canvas tarp, vintage Coca-Cola sign and metal shard resembling a conquistador's helmet. Nothing could be further from the operatic high-mindedness of Abstract Expressionism, or from the spit-and-polish insouciance of Pop, but something of both is there. It's as if a transition between them were taking place before our eyes.

Transition was Rauschenberg's favored mode. As soon as his art seemed to be settling into one groove, he shoved it into another. The 1970s brought the "Early Egyptian" series, with bulky stacks of sand-coated cardboard boxes like sodden monuments. But the same decade also produced the ethereal "Hoarfrost" series made of photographic images printed on strips of gauzy fabric.

There are several examples from the series at Gagosian; they are far and away the most beautiful things in the show. Throughout the 1980s fabric pieces would have many — many, many — iterations. They grew large; their images increased in number, augmented by fields of abstract patterning, and with an assortment of materials and objects — newsprint, dishcloths, umbrellas — attached to the cloth surfaces. It was during this time that Rauschenberg, in response to global politics, created the Rauschenberg Overseas Cultural Interchange, or ROCI, a self-financed good-will initiative.

Since the 1970s he had been giving grant money to artists; now he supported, and joined with, artists in 11 countries, from Cuba to Tibet, in the creation of large-scale projects that, thanks to his name, had international museum exposure.

Some of us who saw ROCI work in the 1980s, and other fabric work from the time ("Spreads," "Salvages") remember it as more than just disappointing; it was enervating, depressing. With its yards upon yards of undifferentiated visual information, this was art on automatic pilot, as buzzingly deadening as the sound of the television sets that the artist had constantly playing in the background as he worked.

Rauschenberg's career, like Picasso's, is a grand one in need of critical editing, though given the hungers of the market, this is unlikely to happen any time soon. Celebration sells.

The Gagosian show, organized by Ealan Wingate, the gallery's director, partly finesses the matter of comparative evaluation of early and late career by dispensing with chronology and turning a survey into a giant combine, with big and small, strong and weak, 1955, 1980 and 2007 all mixed up.

This strategy points up thematic and stylistic links across a wide span, which is historically useful. It also creates — and this is useful too, though for quite different reasons — an impression of cornucopian fecundity that tends to divert attention from individual works and deliver instead a hit of sheer, awesome, wall-to-wall muchness, which was, or eventually became, the Rauschenberg Effect.

This is the way Rauschenberg marketing will probably go: associate the not-so-hot late work with the very hot earlier work, so that when the earlier work is gone, the late work will seem, by association, to shine. The process takes years but happens all the time. How else to explain the 2009 Gagosian exhibition of late Picassos, a puffy display treated as a wonder?

Whatever the packaging, though, Rauschenberg shines through. He was fantastic, a thriller, one who inspired generations of other artists — look around at Gagosian and you'll see dozen of careers in formation — to be promiscuous in their approach to art and life but also to be formally exacting, to be cool-eyed in their thinking but morally tender.

Maybe "good" and "bad" doesn't apply to such a figure? Maybe the simple fact that he did what he did, all of it, the totality, is what counts? We'll see. Whatever the decisions, you'll want to take in, and sift through, the almost all-of-it in this packed show.

"Robert Rauschenberg" is on view through Dec. 18 at the Gagosian Gallery, 522 West 21st Street, Chelsea; (212) 741-1717, gagosian.com

http://www.nytimes.com/2010/11/27/arts/design/27rauschenberg.html?_r=1

Murder! Intrigue! Astronomers?

By JOHN TIERNEY

Viktor Koen

When Danish and Czech scientists exhumed the remains of the astronomer Tycho Brahe in Prague this month, they dug up much more than some bones and hairs. They found something that has eluded astronomers for thousands of years: a story with major box-office potential.

It's "Amadeus" meets "Da Vinci Code" meets "Hamlet," featuring a deadly struggle for the secret of the universe between Tycho, the swashbuckling Danish nobleman with a gold-and-silver prosthetic nose, and the not-yet-famous Johannes Kepler, his frail, jealous German assistant. The story also includes an international hit man, hired after a Danish prince becomes king and suspects Brahe of sleeping with his mother (and maybe being his father!).

For comic relief, there's a beer-drinking pet elk wandering around Tycho's castle, as well as a jester named Jepp, a dwarf who sits under Tycho's table and is believed to be clairvoyant.

Naturally, the scientists analyzing Brahe's remains are steering clear of all this gossip, including the claim that Brahe had an affair with the Danish queen that helped inspire "Hamlet." The archaeologist leading the team cautions that even if they confirm suspicions that Brahe was poisoned by mercury, that wouldn't necessarily prove he was murdered, much less identify the killer.

Typical scientists. Fortunately for Tycho and Kepler, Hollywood has never let a lack of data get in the way of a plot. There's no evidence that Antonio Salieri poisoned Mozart, and look what the movie "Amadeus" did for their album sales. The only difficulty for a screenwriter would be choosing an assassin from the competing candidates (and deciding between scholars' Latin pronunciation of "Tee-ko" or the "Tye-ko" popularly applied to the lunar crater named after him). The movie would open, of course, with the duel in 1566 that cost the 20-year-old Tycho a good chunk of his nose (a sword fight possibly precipitated by an argument over mathematics, or maybe a mistaken astrological prediction by Tycho). Before long Tycho has a metal nose as well as an island with a castle and an observatory, financed by the king of Denmark and equipped with the most precise instruments yet built for tracking the planets and stars.

Tycho wins renown by identifying new stars, including a supernova, but after his royal patron dies, Tycho finds himself out of favor with the son and successor, Christian IV. Tycho goes to Prague and a new patron, Rudolf II, the Holy Roman Emperor. As he prepares to publish his decades of celestial observations, Tycho hopes to prove that all the planets except Earth revolve around the Sun, which in turn revolves around the Earth.

To help with the calculations, he brings in Kepler, a 28-year-old with his own weird model of the universe. Kepler, a devout Lutheran as well as a Copernican, believes that God created cosmic "harmony" by arranging the planets' orbits around the Sun so that they're spaced at distances corresponding to certain geometrical figures (the five "Platonic solids"). Tycho introduces Kepler to the emperor and lobbies for his appointment as imperial mathematician. But before Kepler's appointment is formalized, Tycho suddenly becomes terribly ill after a banquet and dies 11 days later, at the age of 54.

What killed him? At the time of Tycho's death, in 1601, the blame fell on his failure to relieve himself while drinking profusely at the banquet, supposedly injuring his bladder and making him unable to urinate. (Danes still sometimes invoke Tycho when they explain their need to excuse themselves during a meal.) Later medical experts discounted that and said some kind of kidney problem was more likely.

But then, in the 1990s, some hairs from Tycho were separately analyzed. Researchers reported elevated levels of mercury, including one brief high dose that was absorbed within 10 minutes during the final 24 hours of his life.

Those findings inspired "Heavenly Intrigue: Johannes Kepler, Tycho Brahe, and the Murder Behind One of History's Greatest Scientific Discoveries," a 2004 book by a pair of married journalists, Joshua Gilder and Anne-Lee Gilder. They argue that the evidence from the hairs points to two incidents of mercury poisoning, one at the time of the banquet and the other just before death, and that Kepler is the prime suspect because he had the means, the motive and the opportunity.

As an assistant living at Tycho's home, Kepler had access to toxic mercury compounds in Tycho's alchemical lab and could have poisoned him at the time of the banquet, the Gilders write. When Tycho began to recover 10 days later, they reason, Kepler could have administered a second dose because he was one of the few people at the home who saw Tycho the evening before his death.

A devoutly religious scholar may not sound like a good candidate for murderer, but the Gilders argue that Kepler was an unhappy, temperamental zealot. In an astrological self-analysis, he described his "eagerness for trickery" and his plots against his "enemies," and said he was under the influence of Mars's "rage-provoking force." In his furious arguments with Tycho, he called himself an "uncontrollable spirit" and once told a friend that he felt like attacking Tycho with a sword.

Kepler resented Tycho's higher status and, above all, his refusal to allow access to the full log of observations, including the records of Mars's movements that Kepler considered essential to demonstrate the validity of his own model of the universe. Kepler tried several schemes to see Tycho's data — to sneakily "wrest his riches away," as Kepler put it — but Tycho resisted and forced Kepler to keep working on calculations aimed at supporting the Tychonic cosmology.

"Kepler's ambition was to prove his vision of the divine architecture of God's universe," Mr. Gilder says in an interview. "Every time he feels Tycho is getting in the way, he blows up at him. Is it plausible that Kepler would kill for a vision? I look around the world and see it happening all the time. Kepler had felt himself despised and outcast his whole life. This would make him famous."

The Gilders' theory doesn't sound so plausible to Owen Gingerich, an expert on Kepler who is an emeritus professor of astronomy at Harvard. "The single biggest problem with the theory," Dr. Gingerich says, "is that at this point Tycho was very actively lobbying with the Emperor Rudolf to appoint Kepler the imperial mathematician. The appointment was in the final stages of the negotiation. It would have been very dangerous for Kepler to bump off his chief sponsor for the job."

Nonetheless, things ultimately worked out quite nicely for Kepler because after Brahe's death he still got the job — and the data. Even though Tycho bequeathed the observatory's logs to his family, Kepler grabbed them first and held on to the crucial Mars records until he and the heirs and the emperor worked out an arrangement allowing him to finish the project of publishing the observations.

Kepler never managed to prove his divine-architecture model, but he made his name anyway, thanks to the records and his own hunch that the Sun exerted some kind of pull on the planets. Using Tycho's data, he

formulated his famous three laws of planetary motion and discovered that the planets traveled around the Sun in elliptical, not circular, orbits. If he did commit a crime, it certainly paid.

The other murder suspect is Eric Brahe, a Swedish relative of Tycho's who was staying at his home. Eric attended the fateful banquet, and his diary contains incriminating entries alluding to his role in the poisoning, says Peter Andersen, a professor of literature at the University of Strasbourg in France. He argues that Eric was hard up for money and was hired for the hit by the new Danish king, Christian IV.

Professor Andersen has several hypotheses explaining the king's animus. One is that a royal science adviser was a Copernican feuding against Tycho. A more cinematic — and Oedipal — hypothesis is that Tycho may have been secretly consorting with Christian's mother, Queen Sophie, and may have been Christian's father. Professor Andersen argues that the rumors about Tycho's royal affair contributed to Shakespeare's "Hamlet."

Professor Andersen is requesting that the current Danish royal family allow Christian's body to be exhumed so that his DNA can be compared with Tycho's, but don't expect any immediate results. It took Jens Vellev, the archaeologist at Aarhus University in Denmark who is leading the project, nearly a decade to get permission to exhume Tycho's body.

Professor Vellev suspects that if Tycho was poisoned by mercury, it was from an accidental ingestion in his laboratory or from a medicine administered to treat his urinary problems. That suspicion is shared by Lawrence Principe, a historian of science at Johns Hopkins University who is an expert in alchemy. He says it's rash to accuse anyone of murder without direct evidence — and maybe it is, to academics and prosecutors.

But not, of course, to Hollywood producers. They'd have no qualms about accusing *both* men (maybe Eric gives the first dose at the banquet, and then Kepler delivers the second one). The producers' chief concern, when they pitched the project, would be dealing with the response from a typical studio executive:

"Look, you've got some interesting elements to work with here. I love the royal sex and the poison and the duel — could we call him Goldnose? The clairvoyant jester is a nice device. And I totally get the Tycho-Kepler conflict — high-living nobleman versus tormented commoner. But ... do they have to be astronomers?"

http://www.nytimes.com/2010/11/30/science/30tierney.html?ref=science

A Nephrologist and Patient

By CLAUDIA DREIFUS

Gretchen Ertl for The New York Times

Dr. Julian L. Seifter, 61, a nephrologist at Brigham and Women's Hospital in Boston and a Harvard Medical School professor, specializes in treating patients who have chronic kidney disease.
We spoke at his Harvard office for three hours about his new book, "After the Diagnosis: Transcending Chronic Illness," which was written with his wife, Betsy Seifter. It's about living with diabetes, heart disease, lupus, even AIDS. An edited version of that conversation and subsequent e-mails follows.

Q. You are a doctor who treats people with chronic diseases. But you have one — diabetes. Are you a good patient?

A. Mixed. When I was diagnosed — 30 years ago — my first response was to run away from the illness. I was just at the beginning of my career, I had a young family and I didn't want to be held back by my metabolic problems. Yes, I took insulin. But staying on a restrictive diet and monitoring my blood sugar levels was harder. I pretended to myself and others that I wasn't sick.

I've had complications associated with three decades of diabetes — an eye hemorrhage, neuropathies. Over time I've tried for better control of my blood sugar levels, but I've never been perfectly successful. Good control means trying to duplicate what the pancreas does, and I never really wanted to become my pancreas.

Q. Has being a patient helped you be a doctor?

A. I've certainly learned things I've brought back to the clinic. I have a retinopathy, for instance, which can be a complication of diabetes. I don't have good vision in my right eye, as a result. When this first happened, I said to my ophthalmologist, "I can't lose vision. I need to read." And he said, "Any vision is better than no vision."

That was important. I started thinking, "Concentrate on things you still can do and develop some new things." I've since started gardening, which doesn't require the most acute vision. It's something I probably wouldn't have done otherwise. I counsel my patients to replace what they've lost with something new.

Q. Can you give an example?

A. I had one patient who was a scuba diver and who loved discovery. I had to tell him that with his condition scuba diving isn't safe for him. So I've encouraged him to prospect for Native American relics in the Southwest desert, which he's also interested in. It's a way he can still be an explorer, but not risk his kidney.

Q. You write that a chronic disease can provide an opportunity for growth and personal development. That's hard to imagine.

A. It can shake you out of old habits and routines. It takes away the "taken for granted." You're invited, almost forced, to find new directions and pursue unexplored potentials.

I had a patient, Cassandra, an opera singer, who first came to me because it was thought she had a kidney problem. It turned out she had a severe inflammatory condition in the head and neck — in the larynx, her instrument. She could no longer sing professionally. With no science background, she began reading the papers on her treatment and cultivated an interest in the illness. Eventually, she went back to college, took science courses and got accepted to medical school. She's about to become a nephrologist.

Q. So a chronic disease diagnosis doesn't have to be seen as The End?

A. It doesn't have to be. Sometimes it is, though. I had another patient, a policeman, very overweight, with diabetes. He could drink a case of beer at a time. And he totally enjoyed his social life. By the time he was 60, he needed amputation and dialysis. He said, "I don't want that." I wasn't going to talk him out of it. He had hospice care and he died peacefully.

If someone rejects dialysis, I want to make sure they're not doing that because of depression. If a patient is wavering, I'll say: "At least try it. You can always come off." I had a patient who, at first, rejected dialysis, but who agreed to a trial and then found that the treatments made him feel so much better that he then wanted to stay on. It was a three-times-a-week commitment, but he came to see how he could fit it into his life — which he'd still have.

Q. Is it difficult to get patients to agree to a treatment as difficult as dialysis?

A. The alternative is death. I try to meet my patients wherever they are so that they will do it.

I had one who wanted to go to Florida a last time before starting dialysis. I worried about him. His condition was such that he might have heart failure. But I also knew he'd never go onto dialysis without doing this. I said, "O.K., call me when you land in Miami." He said, "Doctor, you don't understand, I'm driving down." Now, this was really dangerous. So I said, "Call me from each state and I'll have the address of someone you can check in with in case there's an emergency."

The phone calls came in regularly until the last day of his trip. I was worried and I called his home in South Florida, and there was such an incredible noise in the background that I could hardly hear his wife. "What's going on?" I asked. "That's the rescue helicopter on the front lawn," she said. He'd made it there, but then needed to be airlifted to the hospital!

Q. Do you regret enabling this journey?

A. No. From my own experiences, I understood why patients sometimes resist doing what's best. The idea of sticking yourself with a needle every day for life: that wasn't easy for me to accept. I hated the thought that every morning I was going to wake up knowing, "I have diabetes." So I'm not a puritan with my patients. You have to do what is possible.

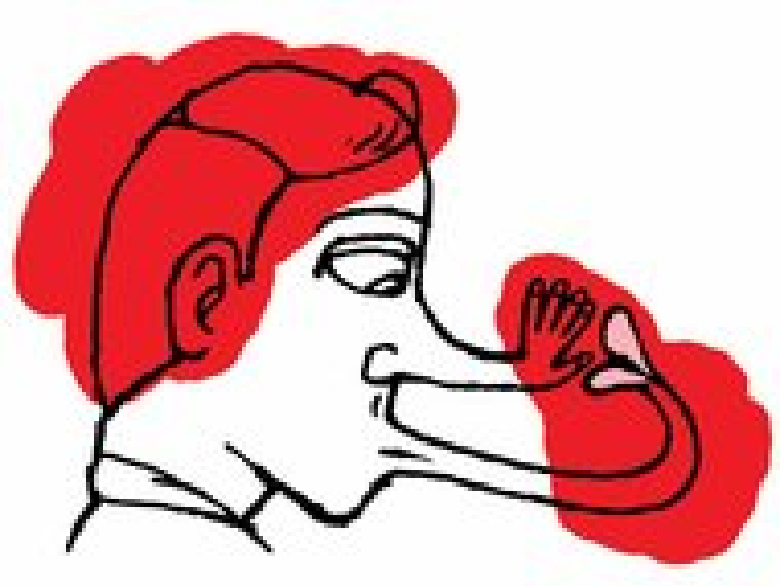
Q. In your book, you suggest a heretical idea: that chronic disease patients deny their situation, a little. You'd better explain.

A. They should do that, within reason. Everyone needs the opportunity to forget their disease for a while and think of other things. Otherwise, they can become their disease. So: I'm not a diabetic. I'm a doctor who *has* diabetes.

Of course, they should do everything that modern medicine offers. I always tell them that it is serious, but it's not the end of all possibilities — you're alive till you are dead. "It's not over till it's over." Yogi Berra, he could have been a great clinician!

http://www.nytimes.com/2010/11/30/science/30conversation.html?ref=science

A Fate That Narcissists Will Hate: Being Ignored
By CHARLES ZANOR



Scott Menchin

Narcissists, much to the surprise of many experts, are in the process of becoming an endangered species.
Not that they face imminent extinction — it's a fate much worse than that. They will still be around, but they will be ignored.
The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (due out in 2013, and known as DSM-5) has eliminated five of the 10 personality disorders that are listed in the current edition.
Narcissistic personality disorder is the most well-known of the five, and its absence has caused the most stir in professional circles.
Most nonprofessionals have a pretty good sense of what narcissism means, but the formal definition is more precise than the dictionary meaning of the term.
Our everyday picture of a narcissist is that of someone who is very self-involved — the conversation is always about them. While this characterization does apply to people with narcissistic personality disorder, it is too broad. There are many people who are completely self-absorbed who would not qualify for a diagnosis of N.P.D.
The central requirement for N.P.D. is a special kind of self-absorption: a grandiose sense of self, a serious miscalculation of one's abilities and potential that is often accompanied by fantasies of greatness. It is the difference between two high school baseball players of moderate ability: one is absolutely convinced he'll be a major-league player, the other is hoping for a college scholarship.
Of course, it would be premature to call the major-league hopeful a narcissist at such an early age, but imagine that same kind of unstoppable, unrealistic attitude 10 or 20 years later.
The second requirement for N.P.D.: since the narcissist is so convinced of his high station (most are men), he automatically expects that others will recognize his superior qualities and will tell him so. This is often referred to as "mirroring." It's not enough that he knows he's great. Others must confirm it as well, and they must do so in the spirit of "vote early, and vote often."
Finally, the narcissist, who longs for the approval and admiration of others, is often clueless about how things look from someone else's perspective. Narcissists are very sensitive to being overlooked or slighted in the smallest fashion, but they often fail to recognize when they are doing it to others.
Most of us would agree that this is an easily recognizable profile, and it is a puzzle why the manual's committee on personality disorders has decided to throw N.P.D. off the bus. Many experts in the field are not happy about it.

Actually, they aren't happy about the elimination of the other four disorders either, and they're not shy about saying so.

One of the sharpest critics of the DSM committee on personality disorders is a Harvard psychiatrist, Dr. John Gunderson, an old lion in the field of personality disorders and the person who led the personality disorders committee for the current manual.

Asked what he thought about the elimination of narcissistic personality disorder, he said it showed how "unenlightened" the personality disorders committee is.

"They have little appreciation for the damage they could be doing." He said the diagnosis is important in terms of organizing and planning treatment.

"It's draconian," he said of the decision, "and the first of its kind, I think, that half of a group of disorders are eliminated by committee."

He also blamed a so-called dimensional approach, which is a method of diagnosing personality disorders that is new to the DSM. It consists of making an overall, general diagnosis of personality disorder for a given patient, and then selecting particular traits from a long list in order to best describe that specific patient.

This is in contrast to the prototype approach that has been used for the past 30 years: the narcissistic syndrome is defined by a cluster of related traits, and the clinician matches patients to that profile.

The dimensional approach has the appeal of ordering à la carte — you get what you want, no more and no less. But it is precisely because of this narrow focus that it has never gained much traction with clinicians.

It is one thing to call someone a neat and careful dresser. It is another to call that person a dandy, or a clotheshorse, or a boulevardier. Each of these terms has slightly different meanings and conjures up a type. And clinicians like types. The idea of replacing the prototypic diagnosis of narcissistic personality disorder with a dimensional diagnosis like "personality disorder with narcissistic and manipulative traits" just doesn't cut it.

Jonathan Shedler, a psychologist at the University of Colorado Medical School, said: "Clinicians are accustomed to thinking in terms of syndromes, not deconstructed trait ratings. Researchers think in terms of variables, and there's just a huge schism." He said the committee was stacked "with a lot of academic researchers who really don't do a lot of clinical work. We're seeing yet another manifestation of what's called in psychology the science-practice schism."

Schism is probably not an overstatement. For 30 years the DSM has been the undisputed standard that clinicians consult when diagnosing mental disorders. When a new diagnosis is introduced, or an established diagnosis is substantially modified or deleted, it is not a small deal. As Dr. Gunderson said, it will affect the way professionals think about and treat patients.

Given the stakes, the blow-back from experts in personality disorders should come as no surprise.

Dr. Gunderson has written a letter co-signed by other clinical and research leaders to the trustees of the American Psychiatric Association and the task force that governs DSM-5. And Dr. Shedler and seven colleagues published an editorial in the September issue of The American Journal of Psychiatry. In the relatively small world of mental health diagnostics, this is most certainly a battle worth watching.

Right now, this much seems clear: It is way too early for the narcissists to give up their seat on the bus.

Charles Zanor is a psychologist in West Springfield, Mass.

http://www.nytimes.com/2010/11/30/health/views/30mind.html?ref=science

Head Out for a Daily Dose of Green Space

By JANE E. BRODY

Yvetta Fedorova

First, the bad news: Americans are suffering from an acute case of "outdoor deprivation disorder," and the effects on physical and mental health are rising fast. Children aged 8 to 18 today spend more time than ever using electronic media indoors — seven and a half hours a day, according to the Kaiser Family Foundation — and less time in outdoor unstructured activity. In response to the No Child Left Behind law, 30 percent of kindergarten classrooms have eliminated recess to make more room for academics.

The resulting lack of physical activity and a growing disconnect with the natural environment have been linked in a host of studies to obesity and obesity-related diseases in children and adults, including Type 2 diabetes, high blood pressure, heart disease, asthma and nonalcoholic fatty liver disease, as well as vitamin D deficiency, osteoporosis, stress, depression, attention deficit disorder and myopia. Dr. Daphne Miller, a family physician affiliated with the University of California, San Francisco, calls them "diseases of indoor living."

Now, the good news: There's a simple remedy — get outside and start moving around in green spaces near and far, most of which are free. A consortium of physicians, health insurers, naturalists and government agencies have banded together to help more people of all ages and economic strata engage in health-enhancing physical activity in parks and other natural environments.

This grass-roots movement has already reached the White House. This year President Obama started the America's Great Outdoors Initiative, proclaiming June "Great Outdoors Month." The initiative aims not just to counter sedentary lifestyles but also to reacquaint Americans with the farms, ranches, rivers, forests, national and local parks, fishing holes and beaches that provide opportunities for people "to stay active and healthy."

The goals dovetail with Michelle Obama's battle against childhood obesity and her initiative Let's Move Outside, a program that's part of her Let's Move campaign. Dr. Miller said that the aim was to "turn our public lands into public health resources. Doctors around the country are beginning to realize that getting patients out of doors has benefits even beyond getting people to exercise.

"It's a lot cheaper to go outside and move than it is to build gyms and a lot of hospitals," she said.

Doctor's Orders: Be Active

Accordingly, Dr. Miller and a growing number of like-minded doctors have begun writing specific prescriptions for outdoor activity, providing patients with maps, guidelines and programs of gradually increased activity based on their abilities. She said that such prescriptions are necessary because many people

"are unfamiliar with the outdoors — they're scared to walk through a park, and they don't know what to do when they get there."

Among possible sources of help: volunteer health guides in parks who can tell people where to go and what to do and park rangers who are trained to advise people who may have health issues. "Our parks provide a huge opportunity," Dr. Miller said. "Currently, fewer than 40 percent of visitors use them for any form of exercise."

Some health insurers have come on board as well. SeeChange Health in California and the Blue Cross and Blue Shield Foundation in North Carolina are supporting outdoor programs in their areas, like the Kids in Parks Initiative of the Blue Ridge Parkway Foundation. SeeChange Health this year announced a pilot project to reimburse members for visits to California state parks.

Other movers and shakers include the National Wildlife Federation, which established the "Be Out There" public-education campaign to foster a daily "green hour" during which every child could enjoy 60 minutes of unstructured play and interaction with the natural world. On its Web site, www.nwf.org, the federation has posted the rationale and specific suggestions for schools and families to counter the physical, emotional and educational drain of an "indoor childhood."

The campaign's mission "is to return to the nation's children what they don't even know they've lost: their connection to the natural world," with activities suitable for all children, whether rural, suburban or urban.

As for its health and educational benefits, the federation cites scientific findings that outdoor play enhances fitness, raises blood levels of vitamin D (which in turn protects against bone loss, heart disease, diabetes and other health problems), improves distance vision, lowers the risk of nearsightedness, reduces symptoms of stress and attention deficit hyperactivity disorder, raises scores on standardized tests and improves students' critical-thinking skills.

The National Environmental Education Foundation is now training pediatric health care providers to serve as nature champions in their communities.

One study of children living in poor urban environments found that those who relocated to greener (though not more affluent) home surroundings "tended to have the highest levels of cognitive functioning following the move." The author of the study, Nancy M. Wells, also found in research among rural children that nearby nature can act as a buffer against stressful life events and improve children's psychological well-being.

Lest you remain unconvinced, I urge you to read the best-selling book "The Last Child in the Woods," by Richard Louv, who coined the phrase "nature-deficit disorder." Mr. Louv describes dozens of studies demonstrating the benefits that wilderness outings can have on mental and physical health.

'Park Prescriptions'

The National Park Service, too, has joined the "park prescriptions" campaign, offering free wellness services that are accessible to all, regardless of health status. (I was shocked to learn on a recent visit to Grand Canyon National Park that, despite many well-maintained trails, only 5 percent of visitors ever venture below the rim of the canyon; about half the people I encountered on the trails were from other countries.)

The park service helped Dr. Eleanor Kennedy, a cardiologist in Little Rock, Ark., create a downtown "Medical Mile," a section of the Arkansas River Trail, and now hopes to support access to similar open spaces in communities nationwide. Dr. Kennedy reports that once she gets her patients outdoors "they are more likely to be consistent about exercise." The Medical Mile project, which had an initial goal of $350,000, managed to raise $2.1 million in two years.

Dr. Robert Lambert, a cardiologist at the Heart Clinic of Arkansas, said: "We see too many patients who need our assistance because of their lifestyle, not because of factors beyond their control. That is why my colleagues and I decided to become involved."

Other programs include Prescription Trails, established in Santa Fe, N.M., with the help of the Centers for Disease Control and Prevention, to counter runaway rates of diabetes in the community. Local physicians get trail guides to distribute to their patients. The Web site www.prescriptiontrailsnm.org is a guide to some of the state's best park and trail walking and wheelchair rolling paths.

This is the second of two columns on health-promoting physical activity.

http://www.nytimes.com/2010/11/30/health/30brody.html?ref=science

War Machines: Recruiting Robots for Combat

By JOHN MARKOFF

David Walter Banks for The New York Times
An armed robot, called Maars, maneuvering at a training site at Fort Benning, Ga.

FORT BENNING, Ga. — War would be a lot safer, the Army says, if only more of it were fought by robots. And while smart machines are already very much a part of modern warfare, the Army and its contractors are eager to add more. New robots — none of them particularly human-looking — are being designed to handle a broader range of tasks, from picking off snipers to serving as indefatigable night sentries.

In a mock city here used by Army Rangers for urban combat training, a 15-inch robot with a video camera scuttles around a bomb factory on a spying mission. Overhead an almost silent drone aircraft with a four-foot wingspan transmits images of the buildings below. Onto the scene rolls a sinister-looking vehicle on tank treads, about the size of a riding lawn mower, equipped with a machine gun and a grenade launcher.

Three backpack-clad technicians, standing out of the line of fire, operate the three robots with wireless video-game-style controllers. One swivels the video camera on the armed robot until it spots a sniper on a rooftop. The machine gun pirouettes, points and fires in two rapid bursts. Had the bullets been real, the target would have been destroyed.

The machines, viewed at a “Robotics Rodeo” last month at the Army’s training school here, not only protect soldiers, but also are never distracted, using an unblinking digital eye, or “persistent stare,” that automatically detects even the smallest motion. Nor do they ever panic under fire.

“One of the great arguments for armed robots is they can fire second,” said Joseph W. Dyer, a former vice admiral and the chief operating officer of iRobot, which makes robots that clear explosives as well as the Roomba robot vacuum cleaner. When a robot looks around a battlefield, he said, the remote technician who is seeing through its eyes can take time to assess a scene without firing in haste at an innocent person.

Yet the idea that robots on wheels or legs, with sensors and guns, might someday replace or supplement human soldiers is still a source of extreme controversy. Because robots can stage attacks with little immediate

risk to the people who operate them, opponents say that robot warriors lower the barriers to warfare, potentially making nations more trigger-happy and leading to a new technological arms race.
"Wars will be started very easily and with minimal costs" as automation increases, predicted Wendell Wallach, a scholar at the Yale Interdisciplinary Center for Bioethics and chairman of its technology and ethics study group.
Civilians will be at greater risk, people in Mr. Wallach's camp argue, because of the challenges in distinguishing between fighters and innocent bystanders. That job is maddeningly difficult for human beings on the ground. It only becomes more difficult when a device is remotely operated.
This problem has already arisen with Predator aircraft, which find their targets with the aid of soldiers on the ground but are operated from the United States. Because civilians in Iraq and Afghanistan have died as a result of collateral damage or mistaken identities, Predators have generated international opposition and prompted accusations of war crimes.
But robot combatants are supported by a range of military strategists, officers and weapons designers — and even some human rights advocates.
"A lot of people fear artificial intelligence," said John Arquilla, executive director of the Information Operations Center at the Naval Postgraduate School. "I will stand my artificial intelligence against your human any day of the week and tell you that my A.I. will pay more attention to the rules of engagement and create fewer ethical lapses than a human force."
Dr. Arquilla argues that weapons systems controlled by software will not act out of anger and malice and, in certain cases, can already make better decisions on the battlefield than humans.
His faith in machines is already being tested.
"Some of us think that the right organizational structure for the future is one that skillfully blends humans and intelligent machines," Dr. Arquilla said. "We think that that's the key to the mastery of 21st-century military affairs."
Automation has proved vital in the wars America is fighting. In the air in Iraq and Afghanistan, unmanned aircraft with names like Predator, Reaper, Raven and Global Hawk have kept countless soldiers from flying sorties. Moreover, the military now routinely uses more than 6,000 tele-operated robots to search vehicles at checkpoints as well as to disarm one of the enemies' most effective weapons: the I.E.D., or improvised explosive device.
Yet the shift to automated warfare may offer only a fleeting strategic advantage to the United States. Fifty-six nations are now developing robotic weapons, said Ron Arkin, a Georgia Institute of Technology roboticist and a government-financed researcher who has argued that it is possible to design "ethical" robots that conform to the laws of war and the military rules of escalation.
But the ethical issues are far from simple. Last month in Germany, an international group including artificial intelligence researchers, arms control specialists, human rights advocates and government officials called for agreements to limit the development and use of tele-operated and autonomous weapons.
The group, known as the International Committee for Robot Arms Control, said warfare was accelerated by automated systems, undermining the capacity of human beings to make responsible decisions. For example, a gun that was designed to function without humans could shoot an attacker more quickly and without a soldier's consideration of subtle factors on the battlefield.
"The short-term benefits being derived from roboticizing aspects of warfare are likely to be far outweighed by the long-term consequences," said Mr. Wallach, the Yale scholar, suggesting that wars would occur more readily and that a technological arms race would develop.
As the debate continues, so do the Army's automation efforts. In 2001 Congress gave the Pentagon the goal of making one-third of the ground combat vehicles remotely operated by 2015. That seems unlikely, but there have been significant steps in that direction.
For example, a wagonlike Lockheed Martin device that can carry more than 1,000 pounds of gear and automatically follow a platoon at up to 17 miles per hour is scheduled to be tested in Afghanistan early next year.
For rougher terrain away from roads, engineers at Boston Dynamics are designing a walking robot to carry gear. Scheduled to be completed in 2012, it will carry 400 pounds as far as 20 miles, automatically following a soldier.

The four-legged modules have an extraordinary sense of balance, can climb steep grades and even move on icy surfaces. The robot's "head" has an array of sensors that give it the odd appearance of a cross between a bug and a dog. Indeed, an earlier experimental version of the robot was known as Big Dog.

This month the Army and the Australian military held a contest for teams designing mobile micro-robots — some no larger than model cars — that, operating in swarms, can map a potentially hostile area, accurately detecting a variety of threats.

Separately, a computer scientist at the Naval Postgraduate School has proposed that the Defense Advanced Research Projects Agency finance a robotic submarine system that would intelligently control teams of dolphins to detect underwater mines and protect ships in harbors.

"If we run into a conflict with Iran, the likelihood of them trying to do something in the Strait of Hormuz is quite high," said Raymond Buettner, deputy director of the Information Operations Center at the Naval Postgraduate School. "One land mine blowing up one ship and choking the world's oil supply pays for the entire Navy marine mammal program and its robotics program for a long time."

Such programs represent a resurgence in the development of autonomous systems in the wake of costly failures and the cancellation of the Army's most ambitious such program in 2009. That program was once estimated to cost more than $300 billion and expected to provide the Army with an array of manned and unmanned vehicles linked by a futuristic information network.

Now, the shift toward developing smaller, lighter and less expensive systems is unmistakable. Supporters say it is a consequence of the effort to cause fewer civilian casualties. The Predator aircraft, for example, is being equipped with smaller, lighter weapons than the traditional 100-pound Hellfire missile, with a smaller killing radius.

At the same time, military technologists assert that tele-operated, semi-autonomous and autonomous robots are the best way to protect the lives of American troops.

Army Special Forces units have bought six lawn-mower-size robots — the type showcased in the Robotics Rodeo — for classified missions, and the National Guard has asked for dozens more to serve as sentries on bases in Iraq and Afghanistan. These units are known as the Modular Advanced Armed Robotic System, or Maars, and they are made by a company called QinetiQ North America.

The Maars robots first attracted the military's interest as a defensive system during an Army Ranger exercise here in 2008. Used as a nighttime sentry against infiltrators equipped with thermal imaging vision systems, the battery-powered Maars unit remained invisible — it did not have the heat signature of a human being — and could "shoot" intruders with a laser tag gun without being detected itself, said Bob Quinn, a vice president at QinetiQ.

Maars is the descendant of an earlier experimental system built by QinetiQ. Three armed prototypes were sent to Iraq and created a brief controversy after they pointed a weapon inappropriately because of a software bug. However, QinetiQ executives said the real shortcoming of the system was that it was rejected by Army legal officers because it did not follow military rules of engagement — for example, using voice warnings and then tear gas before firing guns. As a consequence, Maars has been equipped with a loudspeaker as well as a launcher so it can issue warnings and fire tear gas grenades before firing its machine gun.

Remotely controlled systems like the Predator aircraft and Maars move a step closer to concerns about the automation of warfare. What happens, ask skeptics, when humans are taken out of decision making on firing weapons? Despite the insistence of military officers that a human's finger will always remain on the trigger, the speed of combat is quickly becoming too fast for human decision makers.

"If the decisions are being made by a human being who has eyes on the target, whether he is sitting in a tank or miles away, the main safeguard is still there," said Tom Malinowski, Washington director for Human Rights Watch, which tracks war crimes. "What happens when you automate the decision? Proponents are saying that their systems are win-win, but that doesn't reassure me."

http://www.nytimes.com/2010/11/28/science/28robot.html?ref=science

In California, Carports That Can Generate Electricity
By FELICITY BARRINGER

Peter DaSilva for The New York Times
Roofs of solar panels cover the parking lot of Milpitas High School and Marshall Pomeroy Elementary School in Milpitas, Calif

SAN JOSE, Calif. — And California begat cars, and the cars begat asphalt parking lots. And the lots spawned electricity, transforming the hills and the deserts.

Ersatz roofs made of solar panels have sprouted above dozens of school parking lots in the state, altering vistas and promoting a philosophy of green thinking among the young. Yet the primary driver of the solar roofs is economic.

By forming partnerships with banks and other backers, school districts get guarantees of reliably cheap electricity for their buildings for as long as 20 years. The institutions, which finance the systems and sell the electricity back to the schools, also receive tax incentives from the federal and state governments.

So far, solar carports have been installed at some 75 elementary, high school and community college campuses in California, the majority of them in the San Francisco area. Some are designed as a broad fan of panels canting slightly upward and supported by a single pole; more often they are an ode to rectilinearity, parallel to the asphalt and supported by a line of poles between the rows of parking spaces.

Walter Hood, a designer based in Oakland, said he sees the seeds of a new suburban aesthetic in the proliferation of the photovoltaic panels. “It’s an interesting piece of infrastructure,” he said, adding, “So maybe in the future we’re thinking of parking lots as something that is always covered.”

Schools were not the first to move in this direction. Leading the way in this re-creation of the suburban landscape was Google, which added solar canopies to the parking lots at its headquarters in Mountain View, Calif., three years ago. Some come with outlets for solar-charging electric cars.

“At the Googleplex, the P.V. is almost acting like a grove of trees,” Mr. Hood said.

But schools are now at the leading edge of the trend. “This will soon be the norm,” said Michelle O’Shea, a science teacher at Leland High School in southwestern San Jose, where the parking lot went solar a year ago. “It will be hard to imagine that we didn’t do this.”

For students, the new structures can offer an education in how clean electricity is generated. “Schoolchildren are growing up with it, so it becomes ingrained in their perception of how a society functions,” said Brad Parker, a consultant on a solar carport project for the San Luis Coastal Unified School District in central California.

And interest in the systems is growing. “I’ve gotten calls from Hawaii, from Canada, from all over California,” said John Cimino, the director of maintenance, operations and transportation for the Milpitas Unified School District, northeast of San Jose.

The solar panels fulfill 75 percent of his district’s annual electricity needs during the school year, he said, and 100 percent of its summer needs.

The company that brokered the district’s deal was Chevron Energy Solutions, a subsidiary of Chevron and perhaps the most active of a dozen such intermediaries working around California. The same company helped create a 2.1-megawatt parking lot system on the Fresno campus of California State University.

Brian Swanson, a spokesman for Pacific Gas and Electric, the utility that serves most communities in the Bay Area, said that the overall capacity of school-based photovoltaic systems there grew nearly fivefold from 2008 to 2009, to 15.5 megawatts from 327 kilowatts. This year, the cumulative total was 20 megawatts, enough to power 3,500 homes.

Yet in the Southern California city of Lancaster, a single parking-lot solar system being constructed by the Antelope Valley Unified School District could reach 9.6 megawatts, according to Mat Havens, the district’s director of facilities.

The estimated savings over the 20-year life of a generating contract can run from $12 million for a district like Milpitas (although savings last year were a much more modest $51,000) to $40 million for Antelope Valley.

Yet solar parking lots are not solely a California or Southwest phenomenon. In New Jersey, two elementary schools and a middle school in Newark plan to install them in addition to rooftop photovoltaic installations on the school buildings. Boonton High School in Morris County, N.J., is building solar coverings for its parking lots to supplement photovoltaic systems being installed on the roofs of its ice rinks.

While the solar parking lots have generally been welcomed by local residents, people in one town in San Luis Obispo County were less receptive. A community advisory board in the small coastal town of Los Osos voted 8 to 1 to oppose the panels on parking lots at a local middle and elementary school, with one panel member warning of “visual blight.”

Indeed, the current generation of solar carports does have a utilitarian feel and the bare-bones aesthetic of a Quonset hut.

But Mr. Hood, the Oakland designer, suggested that designers could work with manufacturers to change that, treating the photovoltaic materials as a potentially beguiling “surface treatment” rather than a mere assemblage of panels.

“They are becoming more ubiquitous in our landscape,” he said. “It’s not just parking lots.”

From schools to offices to malls, photovoltaic arrays could one day become as familiar as fire hydrants, Mr. Hood said.

“Once they become ubiquitous, they disappear,” he added.

http://www.nytimes.com/2010/11/26/science/earth/26parking.html?ref=science

Report Questions Need for 2 Diet Supplements
By GINA KOLATA

Lawrence Lool/European Pressphoto Agency

The very high levels of vitamin D that are often recommended by doctors and testing laboratories — and can be achieved only by taking supplements — are unnecessary and could be harmful, an expert committee says. It also concludes that calcium supplements are not needed.

The group said most people have adequate amounts of vitamin D in their blood supplied by their diets and natural sources like sunshine, the committee says in a report that is to be released on Tuesday.

"For most people, taking extra calcium and vitamin D supplements is not indicated," said Dr. Clifford J. Rosen, a member of the panel and an osteoporosis expert at the Maine Medical Center Research Institute.

Dr. J. Christopher Gallagher, director of the bone metabolism unit at the Creighton University School of Medicine in Omaha, Neb., agreed, adding, "The onus is on the people who propose extra calcium and vitamin D to show it is safe before they push it on people."

Over the past few years, the idea that nearly everyone needs extra calcium and vitamin D — especially vitamin D — has swept the nation.

With calcium, adolescent girls may be the only group that is getting too little, the panel found. Older women, on the other hand, may take too much, putting themselves at risk for kidney stones. And there is evidence that excess calcium can increase the risk of heart disease, the group wrote.

As for vitamin D, some prominent doctors have said that most people need supplements or they will be at increased risk for a wide variety of illnesses, including heart disease, cancer and autoimmune diseases.

And these days more and more people know their vitamin D levels because they are being tested for it as part of routine physical exams.

"The number of vitamin D tests has exploded," said Dennis Black, a reviewer of the report who is a professor of epidemiology and biostatistics at the University of California, San Francisco.

At the same time, vitamin D sales have soared, growing faster than those of any supplement, according to The Nutrition Business Journal. Sales rose 82 percent from 2008 to 2009, reaching $430 million. "Everyone was hoping vitamin D would be kind of a panacea," Dr. Black said. The report, he added, might quell the craze. "I think this will have an impact on a lot of primary care providers," he said.

The 14-member expert committee was convened by the Institute of Medicine, an independent nonprofit scientific body, at the request of the United States and Canadian governments. It was asked to examine the available data — nearly 1,000 publications — to determine how much vitamin D and calcium people were getting, how much was needed for optimal health and how much was too much.

The two nutrients work together for bone health.

Bone health, though, is only one of the benefits that have been attributed to vitamin D, and there is not enough good evidence to support most other claims, the committee said.
Some labs have started reporting levels of less than 30 nanograms of vitamin D per milliliter of blood as a deficiency. With that as a standard, 80 percent of the population would be deemed deficient of vitamin D, Dr. Rosen said. Most people need to take supplements to reach levels above 30 nanograms per milliliter, he added.
But, the committee concluded, a level of 20 to 30 nanograms is all that is needed for bone health, and nearly everyone is in that range.
Vitamin D is being added to more and more foods, said Paul R. Thomas of the Office of Dietary Supplements at the National Institutes of Health. Not only is it in orange juice and milk, but more is being added to breakfast cereals, and it now can be found in very high doses in supplement pills. Most vitamin D pills, he said, used to contain no more than 1,000 international units of it. Now it is easy to find pills, even in places like Wal-Mart, with 5,000 international units. The committee, though, said people need only 600 international units a day.
To assess the amounts of vitamin D and calcium people are getting, the panel looked at national data on diets. Most people, they concluded, get enough calcium from the foods they eat, about 1,000 milligrams a day for most adults (1,200 for women ages 51 to 70).
Vitamin D is more complicated, the group said. In general, most people are not getting enough vitamin D from their diets, but they have enough of the vitamin in their blood, probably because they are also making it naturally after being out in the sun and storing it in their bodies.
The American Society for Bone and Mineral Research and other groups applauded the report. It is “a very balanced set of recommendations,” said Dr. Sundeep Khosla, a Mayo Clinic endocrinologist and the society’s president.
But Andrew Shao, an executive vice president at the Council for Responsible Nutrition, a trade group, said the panel was being overly cautious, especially in its recommendations about vitamin D. He said there was no convincing evidence that people were being harmed by taking supplements, and he said higher levels of vitamin D, in particular, could be beneficial.
Such claims “are not supported by the available evidence,” the committee wrote. They were based on studies that observed populations and concluded that people with lower levels of the vitamin had more of various diseases. Such studies have been misleading and most scientists agree that they cannot determine cause and effect.
It is not clear how or why the claims for high vitamin D levels started, medical experts say. First there were two studies, which turned out to be incorrect, that said people needed 30 nanograms of vitamin D per milliliter of blood, the upper end of what the committee says is a normal range. They were followed by articles and claims and books saying much higher levels — 40 to 50 nanograms or even higher — were needed.
After reviewing the data, the committee concluded that the evidence for the benefits of high levels of vitamin D was “inconsistent and/or conflicting and did not demonstrate causality.”
Evidence also suggests that high levels of vitamin D can increase the risks for fractures and the overall death rate and can raise the risk for other diseases. While those studies are not conclusive, any risk looms large when there is no demonstrable benefit. Those hints of risk are “challenging the concept that ‘more is better,’ ” the committee wrote.
That is what surprised Dr. Black. “We thought that probably higher is better,” he said.
He has changed his mind, and expects others will too: “I think this report will make people more cautious.”

http://www.nytimes.com/2010/11/30/health/30vitamin.html?_r=1&nl=health&emc=healthupdateema2

'Last Supper' for the Laptop Generation
By RANDY KENNEDY

Ruth Fremson/The New York Times

IF you had tied on a blindfold, suspended disbelief and allowed yourself to be carried last week to a particular location just off Park Avenue near 66th Street, your reopened eyes would have had trouble telling that they were not inside the Santa Maria delle Grazie monastery in Milan, looking at a sight everyone knows and few have actually seen: a magisterial painting of 13 enrobed men seated oddly on one side of a long dinner table. Even many experts would not have been able to distinguish the wall mural in front of them from the real one, Leonardo's "Last Supper," that "most beautiful and marvelous work," as Vasari described it, doomed to crumble almost from the minute its tempera dried.

But a quick walk around this painting would have revealed a few anachronisms. On the back side the painting's cracked, ancient-seeming plaster was mounted not on quattrocento brick but on Alucore, the kind of aluminum sheeting used for floors in jetliners. In front a ruler-straight seam was running through the head of St. James, a problem that a man high in the basket of a hydraulic cherry picker was trying to correct with a small paintbrush. That he and many of the workers with him spoke Italian — "Bene! Bene!" one called out from below — lent a little verisimilitude. But the view around them was not of a church from Milan's gilded age. It was a view bequeathed by another gilded age, the 19th century one that gave rise to the Park Avenue Armory, in whose vast drill hall all this art-historical re-enacting was taking place. In other words, the traveling Peter Greenaway painting-cinema-lecture-installation-whatever-it-might-be extravaganza had finally come to town.

Beginning Friday and continuing through Jan. 6 Mr. Greenaway, the provocative British filmmaker, along with an international crew of theatrical producers, video experts and art makers will present, for the first time in America, the kind of splashy multimedia art exhibition he has shown to huge, appreciative audiences — and not a few irritated art scholars — around the world for three years now. The show inaugurates the first full season of programming by the Park Avenue Armory since it began reinventing itself as an unconventional arts center three years ago.

Mr. Greenaway's exhibition, born of his desire to revive a visual literacy he believes modern eyes have lost when looking at paintings, enlists props, lights, advanced digital projectors, towering screens, recorded music, voice-overs, precise copies of paintings (though sometimes the real ones) and practically every other

theatrical aid besides smoke machines and interpretive dancers in the cause of trying to bring masterpieces of Western art to life.

The exhibitions began in 2006 as an experiment, with projections onto the canvas of the real "Night Watch," Rembrandt's masterpiece at the Rijksmuseum in Amsterdam, where Mr. Greenaway, 68, lives and is revered enough to have received permission to experiment with such a Dutch national treasure. (He was yelled at nonetheless by some viewers when the show opened. "To them, I suppose I was trying to put a fifth leg on a four-legged cat," he recalled in an interview.)

The idea took off, and since then has involved the real "Last Supper," onto which Mr. Greenway superimposed projections for one night in 2008; an exhibition with a replica of Veronese's "Wedding at Cana" last year in Venice; and two more "Last Supper" shows, in Milan and Melbourne, using the replica of the "Last Supper" that was recently shipped from Spain to New York in six panels.

A week ago inside the armory drill hall workers from Change Performing Arts, a Milanese theatrical production company, began building a life-size re-creation — its proportions exact to within millimeters — of the refectory of Santa Maria delle Grazie, where "The Last Supper" was completed by Leonardo in 1498 after several years of work.

The copy of the painting for the Greenaway show was made 510 years later in far less time, about five weeks, by a company called Factum Arte, based in Madrid and London, a pioneer in the use of high-resolution photography and three-dimensional scanning to recreate paintings and sculpture so precisely that it is now working, at the request of scholars and conservators, on projects involving paintings by Caravaggio and several tombs in the Valley of the Kings in Egypt. The "Last Supper" replica — which the company prefers to call a clone, though it was made with borrowed photographic data less precise than the company generally uses — was "painted" by an inkjet printer that slowly covered panels of plaster, much like the kind Leonardo worked on, with paint that mimics the original but is designed to last much longer. (Leonardo used an experimental tempera mixture on dry plaster that proved disastrously fragile.)

By Thanksgiving the only major element of the production inside the drill hall that had not yet arrived was Mr. Greenaway himself. There were last-minute visa problems, caused partly by an overstuffed passport. But by Saturday morning he had made it and, dressed in what seems to be an unvarying uniform — dark pinstriped suit, dark shirt and dark knotted scarf — he was in constant motion in a swirl of consulting producers and workers, looking a little like the harried director Guido Anselmi in "8 ½" by Fellini, one of Mr. Greenaway's heroes.

"It looks bigger than I thought it would, but that's a pleasant surprise," he said, craning his neck to take in the replica of the refectory, which looked like a kind of Renaissance spacecraft under repair beneath the hangarlike armory roof, with lots of room to spare (even with the addition of a huge second structure evoking an Italian piazza, where another part of the half-hour production projects images of Veronese's "Wedding at Cana," recreating the 2009 exhibition in Venice).

Over a cup of untouched tomato soup several hours later Mr. Greenaway talked about how his interest in creating these shows grew not only out of his own early training as a painter and his desire to use film for primarily painterly purposes. He has often described "The Cook, the Thief, His Wife and Her Lover" from 1989, probably his best-known movie and one that shocked audiences at the time, as being much more about color than about its ostensible themes of sex, death and cannibalism.

The motivation grew even more out of his waning interest in cinema, whose death he has been proclaiming loudly for more than a decade, even as he continued to make movies. In his view the motion picture, around for little more than a century, has exhausted its possibilities as an evolving art form and lost its hold on the imaginations of a Web-connected populace. What began to obsess him was the idea of seeing what advanced 21st-century movie technology ("The tools of cinema are now wasted on cinema," he said) could do if harnessed to a few thousand years of its two-dimensional forefather, Western painting.

"On a basic level, if it itches, you have to scratch it," he said. "So if I complain that cinema is bad, then I've got to try to put something back in its place."

Of the paintings he has volunteered for this mission so far, and those on his wish list — among them, "Guernica" by Picasso; a major Jackson Pollock drip painting at the Museum of Modern Art; the Sistine ceiling as perhaps a grand final act — he said: "We don't turn them into films. They're not animated works of art. They're not cartoons. But we can change the color, and we can change the contrast, and we can change the chiaroscuro, and by inference we can make these paintings cinematic in a curious way."

A few days later, pacing pensively during a run-through of the production — a raised table evoking the “Last Supper” dinner table glowed ominously red and then blindingly white; Mr. Greenaway’s own basso profundo boomed forth like the voice of God. Projections of painting details wheeled vertiginously around a few onlookers — he said he was a little worried that the whole thing was dragging a bit, like a slow episode of “Masterpiece Classic.”
“It’s also my responsibility here to introduce notions of legitimate entertainment,” he said.
But Adam Lowe, the founder of Factum Arte and the creator of the “Last Supper” replica, stood by smiling, saying that he cared only about the theoretical approval of one viewer: a restless artist himself, who ultimately loved experimenting more than painting. “And if he were here today,” he said, “I think Leonardo would be the happiest man in the world.”

http://www.nytimes.com/2010/12/03/arts/design/03greenaway.html?ref=design

Visual Culture Out of Africa

By ROBERTA SMITH

Chester Higgins Jr./The New York Times
An installation view of "The Global Africa Project" at Museum of Arts & Design

Africa is everywhere, so pervasive in our lives that we barely see it. Since it is in all likelihood the continent where human evolution began, it is literally in the bloodstream of everyone. DNA aside, huge portions of everyday life and cultural achievement are unthinkable without Africa.

What would Modern art be like if Matisse had never gone to Morocco or if he, Picasso and the German Expressionists had never set eyes on the sculptural innovations of sub-Saharan Africa? Very hard to say. And popular music? Around the world, it incorporates sounds and rhythms that originated in Africa. More locally, jazz — not Abstract Expressionism — was the first American art form of international stature.

"The Global Africa Project" at the Museum of Arts & Design tries to survey this pervasiveness, in terms of contemporary visual endeavors of all kinds: jewelry, fashion, architecture, basketry, ceramics, painting, utilitarian design. This sprawling cornucopia has been wrested into existence by Lowery Stokes Sims, former director of the Studio Museum in Harlem and, since 2007, international curator at the Museum of Arts & Design; and Leslie King-Hammond, former dean of graduate studies at the Maryland Institute College of Art and, since 2006, founding director of the institute's Center for Race and Culture.

This show presents 200 works by nearly 120 people, teams and collectives. It represents artists, designers, artisans, D.I.Y. improvisers and people engaged in various combinations of those already fuzzy job descriptions, toiling in ways that blur aesthetics, sociology and philosophy.

Astoundingly ambitious for a relatively small institution, "Global Africa" aims, in the words of its news release, to explore the "impact of African visual culture on contemporary art, craft and design around the world." Unsurprisingly, the exhibition does not fully meet that tall order. It suffers from an excess of high-end luxury items and a shortage of genuine quality-of-life-changing design solutions. And unfortunately, it almost completely ignores Africa north of the Sahara. It is also plagued by too much ersatz stuff in all categories.

But ultimately this show's strengths surpass its weaknesses, or maybe merge with them. If it lacks coherence, that is because there is none to be revealed. While there are individual references to distinctly African

traditions and formal vocabularies, no single look or style emerges, and that's the point. The show's massing of information and accomplishment is often incredibly moving.

As you make your way through the crowded displays, you can almost hear the seams of the building creak under the strain. Though that sound may sometimes be simply your brain, boggled by the inundation of insights and attitudes, or even the fresh juxtaposition of familiar entities.

I loved seeing the work of Joyce Scott, the Baltimore bead sculptor extraordinaire, in the same vitrine as the beaded and sequined voudon flags, or drapos, of the Haitian artist George Valris. Likewise, the nearby grouping of J. D. 'Okhai Ojeikere's photographs of the ostentatiously sculptural headdresses and hairdos of African women, with the majestic hats of Evetta Perry, owner of Harlem's Heaven Hat Boutique, and the softer, nonetheless crownlike, crocheted hats of the artist Xenobia Bailey.

Most but not all of the participants are of African descent. One exception is the Italian photographer Daniele Tamagni, who is represented by photographs of proudly stylish Congolese dandies — mostly men — known as the Society for the Advancement of People of Elegance. His images are among the exhibition's several photographic high points — along with the irreverent, cultural polyglot self-portraits of the Nigerian-born Iké Udé, and the real-life style mixings captured in Nontsikelelo Veleko's street photographs of imaginatively dressed South Africans.

And most but not all of the participants work in the United States, Europe, the Caribbean or Africa. The exceptions are Ramijabi Madarsahib and Kairumbi Karimsahib, members of the Siddi Women's Quilting Cooperative in Karnataka, India, descended from East Africans who started coming to India as early as the seventh century as sailors, slaves, servants and merchants. Each woman is represented by a small, bright, gemlike quilt made from discarded saris. The loose geometric patterns are a result of a process of all-over stitching (back and front) that is different from traditional American piecework.

Call them art, crafts or textiles, these quilts are among the most extraordinary aesthetic objects to be seen in any New York museum right now. If everything else here measured up to them, this show would be great beyond belief.

Despite its ups and downs, the exhibition delivers overreaching insights with inarguable immediacy. One of these is that categorical neatness is an exaggerated curatorial value. All museums should periodically assemble shows that ignore the distinctions among contemporary art, design and craft. The resulting friction between nonfunctional and functional, spiritual and practical, handmade and machine-made, and professional and self-taught is music to the eyes. What's more, it is closer to the way visual culture really happens.

Other insights relate more directly to life. Foremost is the do-it-yourself ethic. Nothing happens if you do nothing. Taking action is a way to take responsibility, but also a way to inspire others to act. And often something can be made out of almost nothing.

Equally important is the role of well-made and/or beautiful things, functional and not, as life-sustaining nourishment. The visual vitality of objects foments human vitality.

One example argues both points: Tyree Guyton's Heidelberg Project, documented here in photographs and a video. It began one day in the late 1980s when Mr. Guyton, with help from his family, began to clean out an abandoned house on their drug-dealer-infested block in Detroit. Mr. Guyton arranged the gathered debris in colorful assemblages and reliefs in vacant lots and went on to clean out and decorate other houses and lots in the neighborhood. Heart-warming, yes, and it also began a process that helped rid the neighborhood of drugs.

Another pertinent concept at large in the show is recycling trash and, related, the repurposing of existing materials. This occurs in the cosmopolitan dresses made from several patterned fabrics by the Nigerian-born fashion designer Duro Olowu, who lives in London; a sturdy cabinet made from recycled metal oil drums by the Senegalese furniture designer Ousmane M'Baye; and a marvelously evocative columnar sculpture, "Tchin-Tchin, BP!," that Romuald Hazoumé, born in Benin, fashioned from plastic oil canisters. Inspired by the BP oil spill this year, it transcends the artist's description of it as a kind of "ironic" Champagne flute to merge suggestions of human, tree and anthill.

Recycling is also apparent in the industrial design team of Birsel & Seck's low, curving stools, made in Dakar from one of the country's most plentiful byproducts: discarded plastic bottles and bags. Wahala Temi's "Afrikea" chair — made from Ikea stools — puts a conceptual spin on it.

There are seemingly stark contrasts of intention and effect. Among the more opulent inclusions are the handsome hammered silver vessels of Ndidi Ekubia, a British-born daughter of African immigrants, and the

BMW hand-painted with geometric patterns by the South African muralist Esther Mahlangu (surely the best result of the company's self-serving art-car campaign).

Among the least opulent displays is a book set in a Plexiglas sleeve on the wall. "The Boy Who Harnessed the Wind: Creating Currents of Electricity and Hope" tells the inspiring story of William Kamkwamba of the landlocked Republic of Malawi. Forced to forgo school as a teenager to help his family survive, Mr. Kamkwamba scavenged materials to build a windmill that took electricity and clean water to his village for the first time.

But again and again, simplistic oppositions don't hold up. It helps to see each item on display as a marker for a larger story, like Mr. Kamkwamba's book, to be extracted from labels or the show's catalog. The glass-bead necklaces of Nomoda Ebenezer Djaba, also known as Mr. Cedi, have an attractive luminosity. The label reveals that they are made of recycled bottles, a process, the catalog elaborates, that has helped Mr. Cedi make his craft, handed down through several generations, more viable. This exhibition is full of such local success stories, in which craft traditions, recycling and human ingenuity coalesce, and lives are changed and even saved.

"The Global Africa Project" has a brilliant, concept-compressing name. The glowing alloy of its first two words — "Global Africa" — invokes a large continent and its worldwide influence, while "Project" paradoxically signals open-endedness: work in progress, loose ends, an interim report rather than a finished exhibition.

It is the kind of show that had to be done, that deserves to be done better and that may take a few attempts to get right. The Museum of Arts & Design should consider making it a recurring, truly continuing project, like the Whitney Museum's biennial or the New Museum's triennial. Every four or five years, take a trans-medium look at Africa and its global legacy; they will never become less important.

"The Global Africa Project" continues through May 15 at the Museum of Arts & Design, 2 Columbus Circle; (212) 299-7777, madmuseum.org.

http://www.nytimes.com/2010/12/03/arts/design/03mad.html?ref=design

Adding Green Space to MoMA With Tropical Terrariums

By CAROL VOGEL

Jason Mandella
"Slug" is a terrarium by Paula Hayes in the Museum of Modern Art lobby.

The Museum of Modern Art lobby — that awkward space designed by the Japanese architect Yoshio Taniguchi — spans a city block, making it as much a thoroughfare as a museum entrance. People flood the place throughout the day, ducking in from the cold, avoiding street traffic or simply using it as a meeting spot. For curators at the museum, the lobby is a challenge. Because the doors open and close all day long, the temperature fluctuations make it a difficult place to put art. The only works shown there have been photographs by Irving Penn; videos by the Dutch artist Aernout Mik; and a 21-foot-tall balloon with multiple eyes, a design by Tim Burton.

Just a few days ago, however, some visitors walking through the lobby were slowing down, taking in two new additions: 21st-century terrariums. One, "Slug," is 15 feet long, a gentle biomorphic shape that hangs on the lobby's west wall; nearby, the second, "Egg," is a free-standing floor-to-ceiling domelike structure. Each is made of blown glass and silicone, and filled with myriad tropical plants, including begonias, creeping miniature figs and a smorgasbord of ferns with names like maidenhair, fluffy ruffles and Suzi Wong.

"We are not keen on all kinds of modern art, but this is brilliant," said Laura Casado, a visitor from Valladolid, Spain, who was on vacation with her husband, Javier. On Monday afternoon, while Mr. Casado was busy photographing the terrariums, Ms. Casado explained, "My husband especially loves things that grow."

These hybrids of art and urban-dweller's garden make up the small exhibition "Nocturne of the Limax maximus," running through Feb. 28. They come from the New York artist and landscape designer Paula Hayes, who has been blogging about the project on MoMA's Web site, moma.org.

"It's people-friendly art — you don't need a Ph.D. in art history to get it," said Ann Temkin, chief curator of the museum's department of painting and sculpture. "It's also about crossing borders — animate, inanimate — a way to add life to the space in an oddly sensuous way."

Ms. Hayes said she had deliberately created shapes that were integral to the lobby's architecture. "The forms just came into my head," she added. The show's title — "Nocturne of the Limax maximus," or night music of the great slug (commonly called the leopard slug) — comes from a form that she happened upon. "When I

started doing sketches, my son showed me a YouTube video of leopard slugs mating," she said, explaining that her drawings reminded him of the shapes in the video. "I had no idea they were so beautiful. I always thought they were something to be walked around."

Since the lobby doesn't offer enough light to nurture the plants, carefully concealed in each terrarium are full-spectrum lights programmed on timers to simulate 13 hours of daylight.

As the months go by, many of the plants will begin to flower, Ms. Hayes said. And when the exhibition ends in February, then what? "The plants will come home to me," she said. "I grew them in my studio for six months prior to the exhibition." As for "Slug," she said it was up for acquisition by MoMA, "so we'll just have to wait and see."

FRANK STELLA PREPARES FOR LONDON

Frank Stella's work has been exhibited in London on and off for more than four decades. "But it's been at least five or six years since I last had a show there," Mr. Stella said in a recent telephone interview. Now he is busy preparing for a London exhibition next fall at Haunch of Venison, the Christie's-owned gallery.

Unlike most artists, who are quite vocal about their dislike for the commercial practices of auction houses, Mr. Stella, 74, does not seem bothered by his newfound association.

"I don't live or die by auction results — they seem quite artificial to me," he said, adding: "While the gallery may be owned by Christie's, it's a wonderful space. And the main idea is to have the art look good."

Haunch of Venison occupies a grand 19th-century building just behind the Royal Academy in the West End. (It also has spaces in Berlin and in New York, around the corner from Christie's in Midtown Manhattan, and officials at the gallery say they are looking at sites in Chelsea.)

"Frank is a living legend," said Matt Carey-Williams, a director of Haunch of Venison in London. "We want to introduce him to a younger, newer audience and refresh our own memories." The show will be a retrospective of sorts and will include 20 to 40 works, arranged thematically and spanning about 40 years, Mr. Carey-Williams said. It is a collaboration by Haunch of Venison and FreedmanArt, a gallery run by Ann Freedman, who left Knoedler & Company last year after being its director for 32 years.

"Ann is Frank's global representative," explained Mr. Carey-Williams, when asked about the association.

Some of the works are from Mr. Stella's personal holdings; others will be loans from collectors and museums. Much of it will be for sale, Mr. Carey-Williams said. There will also be some new pieces that Mr. Stella said he was working on. "They are the usual hybrid," he explained, referring to his signature polychrome reliefs that are a cross between paintings and sculptures.

NEW CURATOR AT THE NEW MUSEUM

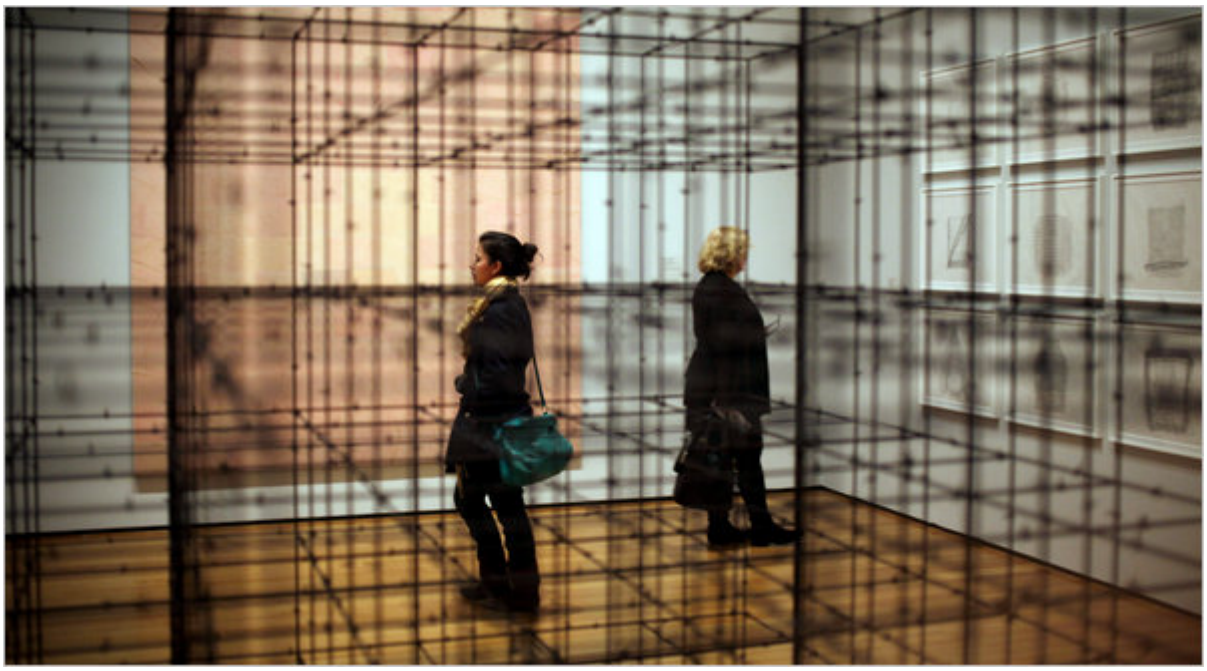
In October Massimiliano Gioni, director of special exhibitions at the New Museum, was named its associate director and director of exhibitions. Now Mr. Gioni is shoring up his team. This week he said he had hired Gary Carrion-Murayari away from the Whitney Museum of American Art. Mr. Carrion-Murayari, 30, has been at the Whitney for seven years and is perhaps best known as a co-curator of the 2010 Biennial. When he starts at the New Museum on Dec. 20, he will be associate curator.

"Gary is one of the most active curators in New York City," Mr. Gioni said in a statement. "He has done an amazing job supporting and exhibiting artists of his generation."

http://www.nytimes.com/2010/12/03/arts/design/03vogel.html?ref=design

Squiggly, Tangly and Angular

By HOLLAND COTTER



Ed Ou/The New York Times
Visitors are seen through Mona Hatoum's barbed-wire "Cube (9 x 9 x 9)" grid at "On Line: Drawing Through the Twentieth Century," the exhibition at the Museum of Modern Art.

By HOLLAND COTTER

As if in direct response to its overscaled, canon-cementing Abstract Expressionism display, the Museum of Modern Art is also giving us something quirky, speculative, physically light, a show called "On Line: Drawing Through the Twentieth Century."

The first exhibition is a pat march through old history; the second, a tangly exploration of undertraveled paths that intersect in surprising ways.

The museum does drawing surveys at regular intervals. The last one was "Drawing Now: Eight Propositions" in 2002, which focused on young artists and defined drawing quite conventionally, as work in pencil, ink or paint on a flat surface, usually paper. That show came at a time when figurative painting was being pushed very hard, and stylistic references to 19th-century academic art and contemporary cartooning were in favor.

The new survey reflects developments since then, among them a renewed interest in performance and abstraction, and a simultaneous embrace and rejection of digital media. Rather than narrowing a definition of drawing, as the older show did, this one loosens everything up.

Yes, you can draw a line on a flat surface using traditional tools. But you can also sculpture a line, or cut, dig, drip, sew, walk, dance or weave one. You can make a line bold or all but invisible, tiny or 16 miles long. You can draw it with a well-schooled skill or with no skill at all, hands off.

Given such options, any attempt to put a seal on a specific history of drawing is, to say the least, premature. "On Line" — organized by Connie Butler, chief curator of drawings at MoMA, and a guest curator, Catherine de Zegher, the former director of the Drawing Center in SoHo — is very much about history, specifically that of Western modernism, but lays out variant beginnings for it.

We get the standard MoMA beginning in the up-front presence of Picasso. But at least it's Picasso at his most daring, when, in tandem with Georges Braque, he shattered the flatness of the picture plane and angled some of the pieces so they jutted out into space.

It's hard to recapture how disorienting this must have felt at the time, though the inclusion of one of Picasso's 1912 cut-cardboard guitars near the entrance to the show reminds us what the revolution once looked like. Suddenly we were seeing draftsmanship in the round, in depth, lines shooting straight out at us, like bullet trajectories. (MoMA has a show devoted entirely to these early guitar pieces coming in February; it could be, should be, great.)

Grouped around the Picasso object are other artists who did their bit to send 19th-century aesthetics into a tailspin. We see Malevich using drawn lines to stake out the fourth dimension, Umberto Boccioni turning lines into emblems of technological speed, Kurt Schwitters treating lines like beams and risers in architectural collages, and Kandinsky — the show's title is from his writing — transforming lines into jazzy visual dances. And high above all of them in the gallery, some real dancing is in progress, and a different beginning to a history of drawing as line is proposed. Projected on a floating screen is a late-19th-century film of a woman flapping and swirling the long silk sleeves of her dress as she performs a piece by the choreographer Loie Fuller (1862-1928).

Born in America, Fuller was a Folies-Bergère star and avant-garde darling who inspired artists to think of drawing not as static and finite but as action in space and lines as points in motion.

The fluttering dancer in the film, like some exuberant angel, offers a welcome break from the usual-suspects story of modernism, as does another work near the show's entrance, an installation by the young Indian artist Ranjani Shettar.

Composed of hundreds of floating, hand-modeled beeswax pellets linked by an openwork mesh of string, it alludes both to the natural world (buds, stars) and to the Internet, and points to the networking concept of art in the exhibition ahead. Her piece also anticipates the increasing presence of women as the show progresses through the 20th century and into the 21st. If you wanted to choose a single route to trace, theirs is an exciting one.

Early modernism was a largely male preserve, and it is so here, though already in Malevich's Russia we're seeing the abstract textile designs of the great Lyubov Popova. And in the 1950s Georges Vantongerloo's mystical twists of transparent tubing, suspended in a vitrine like marine specimens, are beautifully matched by Sophie Taeuber-Arp's color pencil drawings, like scatterings of tossed-down thread.

In the 1960s and '70s an "open sesame" time for art, sculpture sends organic lines out into space. We see this in Eva Hesse's "Hang Up" with its escapee loop of metal cord; in Edward Krasinski's blue cables leaking across the floor; and in the free-hanging, lopsided steel-wire grids of the Venezuelan artist Gego, born Gertrud Goldschmidt in Germany.

The grid was, of course, the signature form of those years. Ostensibly an emblem of order and stability, it often has a very different effect here. Gego makes a small grid from jigsaw blades; Mona Hatoum a big one from barbed wire; Cornelia Parker another from bullet lead turned into thin wiring.

And like Ms. Parker's, a lot of drawing in the show implies or entails motion. For her well-known performance "Up To and Including Her Limits" (1973-76) Carolee Schneemann made wall-size crayon drawings while swinging above the floor in a harness, as we see her doing in a video. In a 1997 film the choreographer William Forsythe virtually ties his body into knots. In her filmed "Trio A," Yvonne Rainer unfurls a series of everyday moves — the head toss, the walking slouch, the pick-up-the-dropped-key bend — then repeats them in the same order backward. (Ms. Butler contributes a lucid catalog essay, full of ideas, about the movement-line collection.)

Two Canadian artists — Françoise Sullivan in 1948, and Mimi Gellman in 2009 — drew abstract patterns with their movements through snow, while, in a hypnotic 1968 film, the Japanese artist Atsuko Tanaka, famed for her dress made of wires and electric bulbs, used a stick to inscribe huge designs of circles — a circulatory system — in seaside sand as a tide creeps in.

Viewers hungry for more conventional formats will find them, early and late, in work by Paul Klee, by Tomás Maldonado in the 1950s, and by the sublime Nasreen Mohamedi (1937-1990), one of several remarkable Indian artists here, others being Ms. Shettar, A. Balasubramaniam and Sheila Makhijani, who is currently making her New York solo debut at Talwar Gallery in Manhattan.

Their presence — along with that of figures like Zilvinas Kempinas, Vera Molnar, Karel Malich, Lotte Rosenfeld and Emily Kam Kngwarray — lifts the show out of museum business as usual. Unlike the roster selected for "Drawing Now" in 2002, which was almost entirely market preapproved, many of these artists are still trying to secure a place in the international scheme of things.

True, much of their art is ultralow key, though discretion can have advantages. When I visited “On Line” during museum hours, I found a good-size and attentive crowd and a notable absence of drive-by shutterbugs. It’s hard to photograph what you can barely see, whether apparent smudges on a wall (stretched wires wound with horse hair by the French artist Pierrette Bloch) or a big gray blur (waves of concentric ink lines rippling out from a single fingerprint in a wall drawing by Giuseppe Penone).

Although the show barely tiptoes into the digital realm with a few tame samplings, it at least points to it as a direction for further treks. And in general Ms. Butler and Ms. de Zegher have done what curators should do. They’ve dug deep into near-at-hand sources and pulled out little-seen material. (Most of the show is from MoMA’s collection.) They’ve introduced artists from outside, some of whom we can look forward to seeing more of.

In the process they’ve knocked given histories off of pedestals and left old hierarchies off balance. Maybe most important, apart from giving us stimulating art to look at, they’ve continued the job of writing women into art history, not as also-rans but as primary makers and shapers, and quietly but forcefully re-inscribing a political line now ineradicably drawn in the sand.

“On Line: Drawing Through the Twentieth Century” is on view through Feb. 7 at the Museum of Modern Art; (212) 708-9400, moma.org.

http://www.nytimes.com/2010/12/02/arts/design/02online.html?ref=design

Using Wealth to Critique the Wealthy

By RACHEL MARUSAK HERMANN

Goulnara A. Gilyazova/Moscow School of Management, Skolkovo
"Psychological Garden," by the French artists Christophe Berdaguer and Marie Péjus, at the "Workers and Philosophers" exhibition at the Moscow School of Management.

MOSCOW — "Today, everyone in Russia, both rich and poor, mainly thinks about money," Alexander Pogorelskiy said at the Moscow School of Management Skolkovo, which was staging an exhibition primarily financed by his contemporary art fund. "The accumulation of wealth defines success and status," he added. "If we do not change this mentality, we have no chance for modernization."

He considers contemporary art a catalyst for change. In 2005, he founded the Metafuturism Contemporary Art Development Society, which aims to support alternative and innovative trends in contemporary Russian art. In partnership with the management school, Metafuturism brought the Russian curator Evgeniya Kikodze and the French curator Alexandra Fau together for the show, "Workers and Philosophers," which runs until Tuesday. (Plans to bring the exhibition to Paris next year are still under negotiation.)

As part of the Year of France in Russia, the works of more than 20 neo-constructive French and Russian artists demonstrate visions of consumerism run amok. In one corner of Skolkovo's immense exhibition space, for example, several empty plastic Coke bottles hang from the ceiling with white paper strips infested with black plastic houseflies. This installation by the Moscow-based artist Sergey Bratkov is situated cater-cornered to the softly deranged "Psychological Garden" enclosed with cyclone fencing by the French artists Christophe Berdaguer and Marie Péjus.

Dr. Pogorelskiy explains that the contradiction of the show's taking place at Russia's first business school is intentional: "Our country's elite is formed here. Everything is expensive and exclusive. 'Workers and Philosophers' is the antithesis of a system epitomized in this place." The idea made him smile.

A very wealthy man financing such a show has its own dose of irony. Dr. Pogorelskiy, who acquired his wealth through investments in securities, real estate and alternative energy, is not criticizing the idea of having money, but how it is used. He says that capitalism has forced forms of protest into private sphere and that it is essential to invest in artists outside the mainstream. "This exhibition is antagonistic of the bourgeoisie, yet the bourgeoisie accepts it," he said. "In essence, they are supporting the artists who critique them, their system and their way of life."

For its part, the school says that it does not privilege one economic system over another. The exhibition "does not relate to the education process," said Marina Levashova, Skolkovo's art director, adding that it "just reflects the latest trends in contemporary art."

Dr. Pogorelskiy, whose leitmotif is using money to support ideas, took an early interest in art. Born in Shargorod, Ukraine, he left when he was 16 for university in St. Petersburg, where he earned a doctorate in economic science. He would spend hours at the State Hermitage Museum engrossed with works by Wassily Kandinsky, and he relished photos of East European exhibitions in smuggled art revues that were banned in the Soviet Union.

In 2003, Dr. Pogorelskiy founded Territory of the Future, a company that publishes academic books and three journals, including Logos, a journal on philosophy. (The magazine has issued two special editions for "Workers and Philosophers.")

The Skolkovo school estimates that about 1,000 Muscovites attended the show's opening night Nov. 4. They included Joseph Backstein, director of the Moscow Biennale of Contemporary Art next autumn, who described the exhibition as relevant. "Liberalism, capitalism, the post-Soviet syndrome," he said, "are very interesting topics in Russia right now."

An increasing number of private investors are supporting the contemporary arts in Russia. Dr. Backstein, who is also artistic director of the State Center for Museums and Exhibitions Rosizo, says that for some, "it's just business."

"For others, it's either personal, for publicity or to be a part of a fashionable social scene," he said. "And it's very positive — the more people, the more money circulating, the better it is for art." He qualifies Dr. Pogorelskiy as a patron who is "open-minded and enthusiastic about contemporary culture."

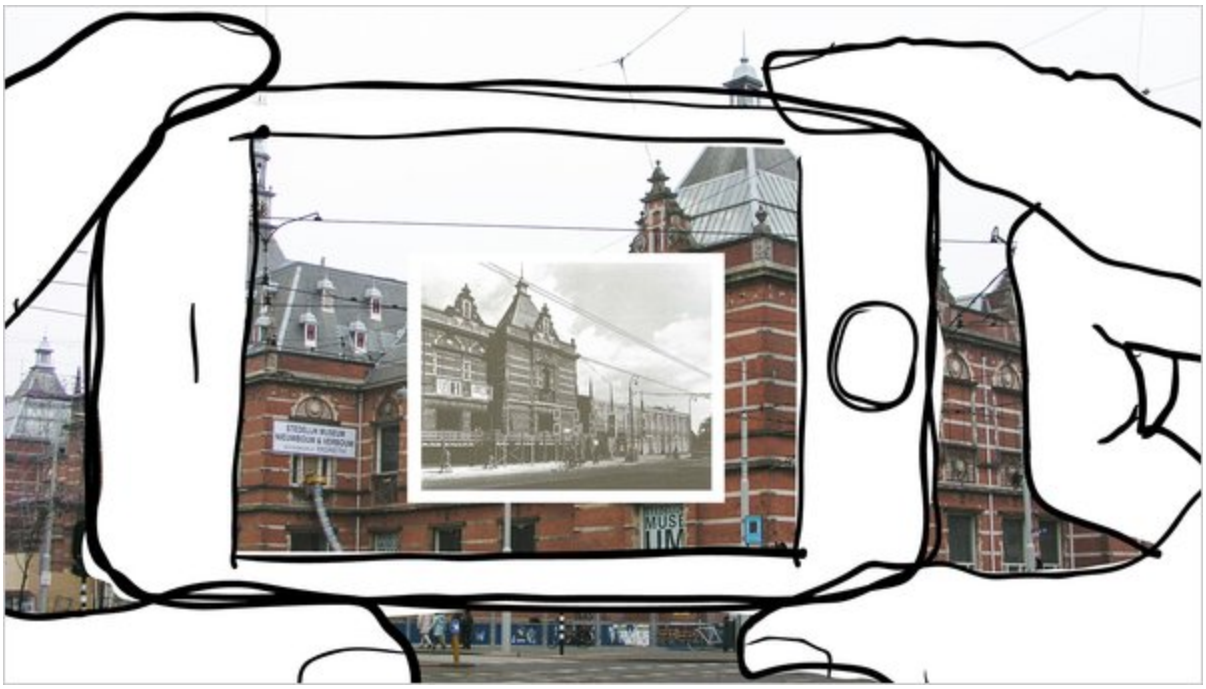
Until recently, contemporary art was relatively restricted to Moscow and St. Petersburg. Now, projects financed through the private sector are popping up across the country and beyond. Through Metafuturism, for example, Dr. Pogorelskiy has taken contemporary art to his hometown, which is 300 kilometers, or 180 miles, southwest of Kiev.

In its most ambitious project, Metafuturism has established an elaborate artist's residency there. What was an abandoned sugar refinery has been transformed into hectares of workspace for artists from around the world. (Groups of four to seven artists stay for a maximum of two weeks at a time.)

Dr. Pogorelskiy's ambitions for Shargorod go beyond the residency. The 5- and 10-year architectural plans for the old factory include a museum, a multimedia center, a hotel and even a small lake for fishing and swimming. He says the project is meant to be not only a paradise for artists, but "an artistic and sociological experiment where Eastern European contemporary culture can develop."

http://www.nytimes.com/2010/12/02/arts/02iht-rartpogor.html?ref=design

Art Gets Unmasked in the Palm of Your Hand
By ALEXANDER FIDEL



Courtesy Stedelijk Museum, Amsterdam
An illustration promoting a smartphone application being developed by the Stedelijk Museum in Amsterdam.

PARIS — “In the ’50s, we were the first museum in the world to have an audio tour,” Hein Wils, a project manager for the Stedelijk Museum in Amsterdam, said last month. “Today, we’re one of the first to have augmented reality.”
Mr. Wils was speaking about the museum’s project that lets people use their smartphones to enrich their museum visits. Smartphones can overlay digital content, like images or movies, across real spaces. Mr. Wils wants visitors to use their phones as lenses, allowing them to see otherwise invisible images — like sleek computer-generated sculptures or floating interviews with artists — on the screens as they walk around the Stedelijk and point their phones’ cameras at objects. This creates what developers are referring to as “augmented reality.”
The Amsterdam museum is not alone in its use of smartphones. Within the next year, many of the top museums in the world — especially contemporary ones — will introduce applications for smartphones, if they have not done so already. The Museum of Modern Art in New York and the Los Angeles County Museum of Art offered smartphone applications this summer, and European museums are following suit. Think of it as a 21st-century update on the audio guide, that staple of museum education departments.
By next spring, the Stedelijk will allow people to interact with exhibitions on smartphones while at their home or in the museum. Although the Centre Pompidou in Paris has no anticipated starting date, it is six months into the production of a smartphone application and already sells exhibition guides to be used with smartphones. The Reina Sofía Museum in Madrid and the Hamburger Bahnhof in Berlin are expecting Web sites or applications designed for mobile technology in the next two years.
The Museum of Modern Art’s application is one of the most popular. Since its iPhone application was introduced in August, it has been downloaded more than 400,000 times, according to Allegra Burnette, the museum’s creative director of digital media.
Drawing on earlier applications like those from the Museum of London and the Brooklyn Museum, MoMA’s application offers a selection of audio tours with images and videos and access to one-fifth of the museum’s collection. MoMA also started offering a Web site for mobile phones last month.

MoMA's effective use of audio, video and slide shows on its smartphone application is likely to keep drawing new users, but the future of museum applications lies in how these features are combined. The Stedelijk is taking a gamble, putting audio and video features on an "augmented reality" Web browser on the smartphone. Stedelijk is using Layar, an application that lays three-dimensional objects over the smartphone's screen when the phone's camera is pointed at real rooms and buildings.

The Stedelijk used the Layar application at the Lowlands music festival in the Netherlands in August and in September at Picnic, a yearly conference in Amsterdam on art, science, technology and business. At Stedelijk stations set up at the events, visitors thumbed through collections showing the museum's works. The works included bar codes that people could scan using a separate application. They then received a digital version of each work. Using Layar, they could "hang" the work on a geographic coordinate within the grounds of the festival. When other Layar users pointed their phones at the coordinate, they could also see the hung work.

The Museum of Modern Art was the site of another Layar exhibition. The Conflux Festival in New York held a show in October, using Layar on smartphones to display art in the museum's galleries without first asking the museum.

Ms. Burnette, the museum's digital media director, was unfazed by this new use. "That's something we were really excited to see," she said. "For us, it means that they care about the museum enough to participate actively in it."

Participation is important for the new generation of applications coming from these museums. The Stedelijk, for example, intends to ask a lot of the user. "We want to make an A.R. project with strong emphasis on user-generated content," Mr. Wils said, referring to augmented reality. He also emphasized the importance of getting artists involved in the process. "We want to see that artists are using the technology to come up with new user experiences," he said.

The Los Angeles County Museum of Art started offering an application last summer, called "In Still Life 2001-2010," that required user participation.

"I myself would call it an interactive participatory work of art, but it's up for interpretation," said Amy Heibel, the museum's director of Web and digital media, referring to the application that lets people rearrange 38 elements of a 17th-century Dutch still life.

This application, produced by the technology companies For Your Art and Ovation, yields results in the style of the contemporary conceptual artist John Baldessari. Its introduction coincided with the June exhibition of Mr. Baldessari's work at the Los Angeles museum.

The general smartphone application for the museum is expected to be introduced by the end of this month. Through an icon that appears on the smartphone's screen, the phone's browser will be connected to the museum's mobile Web site, where users can see 175 works from the permanent collection, with supporting text, video and audio from the curatorial department.

In Madrid, the Reina Sofía is taking a different track. Chema González, the head of cultural activities, says the museum is focusing on audio programming, in an effort keep visitors' eyes on the artworks while enriching their experience. It plans to have four audio podcast channels from which people can download programming onto smartphones and use at home or in the gallery.

"The key is not to offer a substitute for real experience," Mr. González said. With podcasts, Mr. González wants to mix oral history with the museum visit. "What is important is not to narrate each specific work of art," he said. "The works are politically and socially engaged moments. We will focus on context."

Beginning this month, two channels will have programming by exhibiting artists and curators. Another channel will draw programming from the museum's 1970s collective conceptual art, and the last channel will be left for more conceptual programming by artists.

Most museums' smartphone application projects have a similar approach to development, through contracting with outside companies or experts in the digital arts sector. The museums all offer information and gather feedback on social networking and media sites, and almost all the products are free. The Centre Pompidou sells smartphone audio guides to special exhibitions, and the Stedelijk is considering offering premium smartphone editions. But for the most part, all of these new experiences cost nothing but the time it takes to download them.

http://www.nytimes.com/2010/12/02/arts/02iht-rartsmart.html?ref=design

John Singer Sargent, a Realist Who Tried Another Style
By KAREN ROSENBERG

Yale University Art Gallery
Sargent and Impressionism "At Calcot," painted in England, from the exhibition at the Adelson Galleries

"Sargent and Impressionism," at Adelson Galleries in Manhattan, is a mellow, verdant treat for the short, sleety days of December. Does it matter that Sargent's Impressionist period was fairly brief, or that the movement itself didn't play to his strengths? Not really, because he was a quick study and he learned from the best in the business, Monet.

Besides, the show has plenty of scholarship to back up its plein-air pleasures. The gallery's fourth in-depth look at Sargent, it's timed to the release of Volume V of his catalogue raisonné. "Sargent and Impressionism" has its own catalog, too, with an essay by the Sargent scholar Elaine Kilmurray that delves into a newly published cache of letters between Sargent and Monet.

The 28 paintings and smattering of watercolors on view find Sargent taking lessons from Monet and other successful Impressionists (just as he had looked to old masters like Velázquez and Van Dyck in his portraits). Sargent made his name as a portraitist, and his best works all fall into that category: the roguish Dr. Pozzi in his bathrobe, the lonely daughters of Edward Darley Boit and the awkward arriviste we know as "Madame X." But in paintings including the Brooklyn Museum's "Paul Helleu Sketching With His Wife," the Metropolitan Museum's "Reapers Resting in a Wheat Field," and the Tate's "Carnation, Lily, Lily, Rose," nature isn't relegated to the background.

The Brooklyn's painting was at Adelson for only a couple of weeks; the Tate's is there only in reproduction, and in related studies. But the Met's is on the gallery walls for the remainder of the show, as are paintings from the Baltimore Museum of Art; the Museum of Fine Arts, Houston; and numerous other institutions and private collections.

All of the works date from 1883 to 1889 — a period during which Sargent, riding out the scandal over his "Madame X," fled from Paris to the English countryside. His portrait commissions had dried up, and he was eager to try something different.

Impressionism was a safe choice; it was no longer a movement of upstarts and Salon rejects. Monet's exhibitions at the Durand-Ruel gallery in Paris were both popular and profitable. Besides, Sargent had already tried plein-air painting during a summer at Cancale, a Breton fishing village, in 1877; his scenes of oyster gatherers had been received favorably at the Salons.

Although it isn't clear exactly when Sargent and Monet first met (probably in Paris around 1876, the catalog says), they had developed a supportive friendship by the mid-1880s. Sargent visited Monet at Giverny; Monet returned the favor at Calcot Mill, in the English county of Berkshire, where Sargent was painting his own riverside landscapes.

The Calcot paintings in the show ("Landscape With Trees, Calcot," "At Calcot" and "A Backwater at Calcot Near Reading") come closest to Monet's mature Impressionism, with their short, stabbing brush strokes and use of violet and russet tones to add depth to the foliage. Monet said of these works, "I see that Sargent is engaged in this project and proceeds by imitating me."

Elsewhere, though, Sargent seems to have painted Impressionist subjects — lazy afternoons of boating, strolls by the water's edge, naps in the shade — without fully embracing the movement.

His brushwork, influenced by his teacher Carolus-Duran, remains defiantly virtuosic; it turns every ripple of water and blade of grass into a flourish. It's best exemplified by the Brooklyn Museum painting of Paul Helleu, sometimes called "An Out-of-Doors Study." The work depicts Helleu, another artist and mutual friend of Sargent and Monet's, seated outdoors with his wife and his sketchbook. It would be hard to find a more energetically painted riverbank anywhere in art history.

Sargent's palette, too, seems out of step with Impressionism (Monet's Impressionism, at least). He favors bright greens with a straight-from-the-tube look, rather than generating optical mixes of color. (Sargent also insisted on using black pigment, anathema to Monet.) A result is that the English countryside looks strangely tropical, as in "Under the Willows" and "A Backwater at Henley."

The best works of Sargent's Impressionist period, not surprisingly, involve the figure. Gesture and drapery were to Sargent as light and air were to Monet. The show includes several delightful paintings of Violet Sargent, the painter's youngest sister, engaged in boating and other leisurely activities.

In "Violet Fishing" she holds the rod daintily, at a distance from her fluttery white gown. And in "Autumn on the River" she's comfortably adrift, cocooned in furs and a cozy brown blanket, letting her brother and the tide do all the work. (Sargent painted "en bateau," we intuit from the drastically foreshortened composition.)

There's something somnolent, even funereal, about this work — and about Sargent's Impressionist pictures in general, for all their vivid colors and vigorous brushwork. The authors of the catalogue raisonné, Ms. Kilmurray and Richard Ormond, go so far as to suggest that "Sargent was conflating Impressionist technique with themes of dream and sleep, which are very potent in late-19th-century art."

Also dreamlike is the show's masterpiece in absentia, "Carnation, Lily, Lily, Rose," with its singsong title and central image of two children lighting lanterns in a flowering garden at dusk. Sargent's studies for this work, and some related paintings, are on view in a second-floor gallery. Here he's under the sway of Whistler, more than of Monet, scattering the flowers across a flat ground to create the feeling of a Japanese print or textile.

In her catalog essay "Sargent, Monet ... and Manet" Ms. Kilmurray explores one of the more interesting links between Sargent and Monet: their concerted and successful effort to keep Manet's "Olympia" in France and available to the public, following a proposed sale to an American collector.

The idea of "Olympia" as a bridge between Sargent and Monet feels right. Sargent, in the wake of "Madame X," may have admired Manet's frank approach to the figure. Monet, you imagine, valued the painting's unstinting depiction of modern life (the subtext of his own scenes of bridges and railway stations).

Ultimately, Sargent was a Realist who dabbled in Impressionism. As Monet (quoted in the catalogue raisonné) said to the Sargent biographer Evan Charteris: "Sargent didn't like flowers. He used to say that what he didn't like about flowers was that they weren't in harmony with the leaves — he wasn't an Impressionist, in the sense that we use the word."

"Sargent and Impressionism" continues through Dec. 18 at Adelson Galleries, 19 East 82nd Street, Manhattan; (212) 439-6800, adelsongalleries.com.

http://www.nytimes.com/2010/12/01/arts/design/01sargent.html?ref=design

Art's Survivors of Hitler's War
By MICHAEL KIMMELMAN

John MacDougall/Agence France-Presse — Getty Images
Marg Moll's "Dancer," from around 1930, is one of the found works in the "Degenerate Art" show at the Neues Museum in Berlin

BERLIN — The past still thrusts itself back into the headlines here, occasionally as an unexploded bomb turning up somewhere. Now it has reappeared as art.

In January workers digging for a new subway station near City Hall unearthed a bronze bust of a woman, rusted, filthy and almost unrecognizable. It tumbled off the shovel of their front-loader.

Researchers learned the bust was a portrait by Edwin Scharff, a nearly forgotten German modernist, from around 1920. It seemed anomalous until August, when more sculpture emerged nearby: "Standing Girl" by Otto Baum, "Dancer" by Marg Moll and the remains of a head by Otto Freundlich. Excavators also rescued another fragment, a different head, belonging to Emy Roeder's "Pregnant Woman." October produced yet a further batch.

The 11 sculptures proved to be survivors of Hitler's campaign against what the Nazis notoriously called "degenerate art." Several works, records showed, were seized from German museums in the 1930s, paraded in the fateful "Degenerate Art" show, and in a couple of cases also exploited for a 1941 Nazi film, an anti-Semitic comedy lambasting modern art. They were last known to have been stored in the depot of the Reichspropagandaministerium, which organized the "Degenerate" show.

Then the sculptures vanished.

How they ended up underground near City Hall is still a mystery; it seems to involve an Oskar Schindler-like hero. Meanwhile a modest exhibition of the discoveries has been organized and recently opened at the Neues Museum, Berlin's archaeological collection, the perfect site for these works.

Like the sculptures, the museum lately rose, all these years later, from the ruins of war. In the architect David Chipperfield's ingenious, Humpty Dumpty-like reconstruction of the building, it has become a popular palimpsest of German history, bearing witness, via the evidence of the damage done to it, to a violence that not even time and several generations have been able to erase.

I can hardly express how moving this little show is, unexpectedly so. Its effect ends up being all out of proportion to the objects discovered, which are, in strictly aesthetic terms, fine but not remarkable. They are works of quasi-Cubism or Expressionism, mostly not much more than a foot high, several newly cleaned but still scarred, inspiring the obvious human analogy.

The poet and Holocaust survivor Paul Celan came up, in a different context, with the metaphor of bottles tossed into the ocean "at the shoreline of the heart," now finally washed ashore. They're like the dead, these sculptures, ever coming back to us, radiant ghosts.

In a country that for decades has been profoundly diligent at disclosing its own crimes and framing them in the context of history, it makes sense that the exhibition was installed to share a courtyard with Assyrian friezes from a long-ago regime that made an art of totalitarian rule and with an ancient frieze describing the eruption of Vesuvius, which preserved priceless objects, buried in the ash, that have found sanctuary in institutions like the Neues Museum.

Archeologists have so far determined that the recovered works must have come from 50 Königstrasse, across the street from City Hall. The building belonged to a Jewish woman, Edith Steinitz; several Jewish lawyers are listed as her tenants in 1939, but their names disappear from the record by 1942, when the house became property of the Reich. Among its subsequent occupants, German investigators now believe, the likeliest candidate to have hidden the art was Erhard Oewerdieck, a tax lawyer and escrow agent.

Oewerdieck is not widely known, but he is remembered at Yad Vashem, the Holocaust memorial in Israel. In 1939, he and his wife gave money to a Jewish family to escape to Shanghai. He also hid an employee, Martin Lange, in his apartment. In 1941 he helped the historian Eugen Täubler and his wife flee to America, preserving part of Täubler's library. And he stood by Wolfgang Abendroth too, a leftist and Nazi opponent, by writing him a job recommendation when that risked his own life.

The current theory is that when fire from Allied air raids in 1944 consumed 50 Königstrasse, the contents of Oewerdieck's office fell through the floor, and then the building collapsed on top. Tests are being done on ash from the site for remains of incinerated paintings and wood sculptures. How the lost art came into Oewerdieck's possession in the first place still isn't clear.

But at least it's now back on view. Scharff's bust, of an actress named Anni Mewes, brings to mind Egyptian works in the Neues Museum. Karl Knappe's "Hagar," a bronze from 1923, twisted like knotted rope, has been left with its green patina of rust and rubble, making it almost impossible to decipher, save as evidence of its fate. On the other hand, Freundlich's "Head," from 1925, a work made of glazed terra cotta, gnarled like an old olive tree, loses little of its power for being broken. The Nazis seized the Freundlich from a museum in Hamburg in 1937, then six years later, in France, seized the artist and sent him to Majdanek, the concentration camp in Poland, where he was murdered on the day he arrived.

Across the street from the Neues Museum contemporary galleries showcase the sort of work the Nazis hoped to eradicate but that instead give Berlin its current identity as a capital of cool. This is a city that resembles the young masses who gravitate here: forever in a state of becoming, wary, unsure and unresolved, generally broke, but optimistic about the future, with the difference that Germany can't escape its past.

Farther down the block the Deutsches Historisches Museum's Hitler exhibition, today's version of a "Degenerate" show, means to warn viewers about succumbing to what present German law declares morally reprehensible. How could any decent German have ever been taken in? the show asks.

That happens to be the question the Nazis' "Degenerate" show posed about modern art. Many more Germans visited that exhibition than the concurrent one of approved German art. Maybe Oewerdieck was among those who went to the modern show and saw these sculptures in it. In any case, today's Germany has salvaged them and has organized this display. Redemption sometimes comes late and in small measures.

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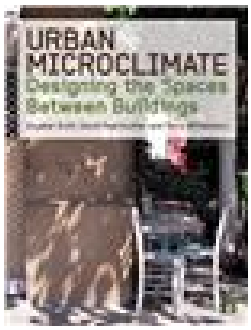
Urban Microclimate
02 December 2010 Earthscan



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- **Author:** Evyatar Erell, David Pearlmutter and Terry Williamson
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- **Number of pages:** 304
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The quality of life of millions of people living in cities could be improved if the form of the city were to evolve in a manner appropriate to its climatic context. Climatically responsive urban design is vital to any notion of sustainability: it enables individual buildings to make use of renewable energy sources for passive heating and cooling, it enhances pedestrian comfort and activity in outdoor spaces, and it may even encourage city dwellers to moderate their dependence on private vehicles.
Urban Microclimate bridges the gap between climatology research and applied urban design. It provides architects and urban design professionals with an understanding of how the structure of the built environment at all scales affects microclimatic conditions in the space between buildings, and analyzes the interaction between microclimate and each of the elements of the urban landscape. In the first two sections of the book, the extensive body of work on this subject by climatologists and geographers is presented in the language of architecture and planning professionals. The third section follows each step in the design process, and in part four a critical analysis of selected case study projects provides a demonstration of the complexity of applied urban design. Practitioners will find in this book a useful guide to consult, as they address these key environmental issues in their own work.
Evyatar Erell and David Pearlmutter are Associate Professors at the Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Israel.
Terence Williamson is Associate Professor at the School of Architecture, Landscape Architecture & Urban Design, The University of Adelaide, Australia.
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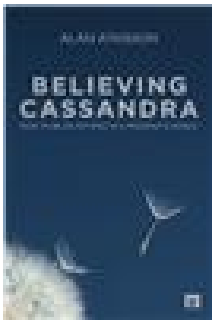
Believing Cassandra

02 December 2010 Earthscan



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'Exceptionally readable and erudite ... I see Believing Cassandra as more than a book. I see it as a neurotransmitter that signals to humanity what to do and what not to do....As rigorous as this book is with respect to science and facts, I see it as a blessing, not a warning, a benediction rather than an omen, because the information we need to make the transition from a culture of unimpeded growth to one of humane development is the same information that describes our demise, if it is ignored.'
From the Foreword by Paul Hawken
A bestseller on Amazon.com within months of its first release, Alan AtKisson's debut book quickly became a modern classic of sustainability literature. Global companies, grassroots groups, university courses, government agencies, and even the US Army ordered it by the box. Now fully revised and updated, Believing Cassandra: How to be an Optimist in a Pessimist's World is even more relevant, fresh, and motivating than when it first appeared in 1999.
In a style that's refreshingly candid and vivid, with unforgettable personal anecdotes, AtKisson provides us with a bridge over the sea of despair, and shows us how to catch the wave to an enticing, sustainable future. He empowers the reader to join the pioneers who created the ideas, techniques and practices of sustainable living - the people who prove Cassandra's warnings wrong, by believing in them, and taking strategic action.
Alan AtKisson is President and CEO of The AtKisson Group, an international sustainability consultancy to business and government (see www.AtKisson.com). Known around the world for his inspiring keynotes and workshops, he is also the author of The ISIS Agreement (Earthscan 2008) and co-author of The Natural Advantage of Nations (Earthscan, 2006).
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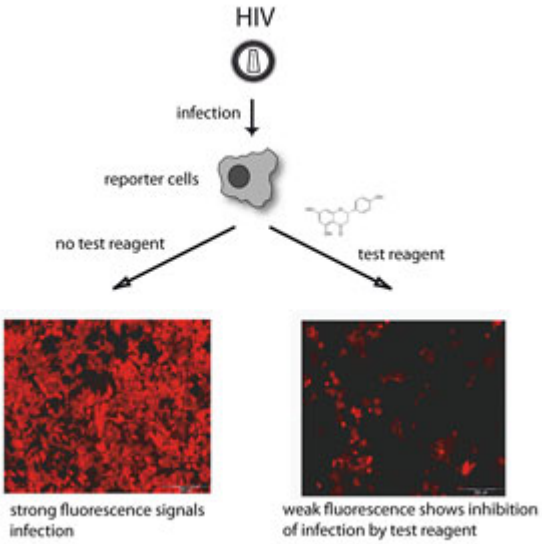
A powerful new technology to identify HIV inhibitors



Identification of HIV inhibitors with EASY-HIT technology. (Schematic by Stephan Kremb)

02 December 2010 Helmholtz Zentrum Muenchen - German Research Centre for Environmental Health

Providing long-term HIV treatment for over 33 million infected individuals worldwide requires the continuous development of new HIV therapies. Virologists at the Helmholtz Zentrum München have developed a cell-based assay system for easy, reliable identification of HIV inhibitors. This new technology can be used to screen large collections of well-characterized reagents as well as raw extracts of biological specimens. The assay system is described in detail in the current issue of Antimicrobial Agents and Chemotherapy*.

EASY-HIT** is a new cell-based assay system for simple and reliable testing of HIV inhibitors. This system was developed under the leadership of Professor Ruth Brack-Werner at the Institute of Virology. At the heart of the system are cultured human cells that allow HIV to enter and replicate efficiently and that signal HIV infection by producing a red fluorescent protein. The EASY-HIT technology can be used to identify HIV-inhibitors, measure the potency of their inhibitory activity and to detect the stage of replication targeted by the inhibitor.

The researchers validated their technology with a panel of currently used anti-HIV drugs and then went on to identify 5 new HIV inhibitors. They also showed that this technology can be used to detect anti-HIV activities in raw plant extracts. The researchers are currently using this system to explore numerous biological specimens for anti-HIV activities and have already discovered novel unexpected sources of antiviral activities.

Stephan Kremb, first author of the manuscript, summarizes, “We expect the versatile and robust EASY-HIT system to identify new targets against HIV and new sources of HIV-inhibitors”. “Our technology has many applications in HIV research and pharmaceutical drug design”, adds Ruth Brack-Werner.

HIV was first discovered in the early 1980s and described as the causative agent of AIDS. As there is no cure for HIV infection as yet, HIV-infected individuals require life-long treatment with antiviral drugs. The problems with currently available therapies include drug side-effects, the emergence of resistant viruses and the cost of long-term treatment. “It is our particularly hope that the EASY-HIT technology will promote the development of new strategies for HIV treatment in areas with limited resources”, states Ruth Brack-Werner.

*Original publication

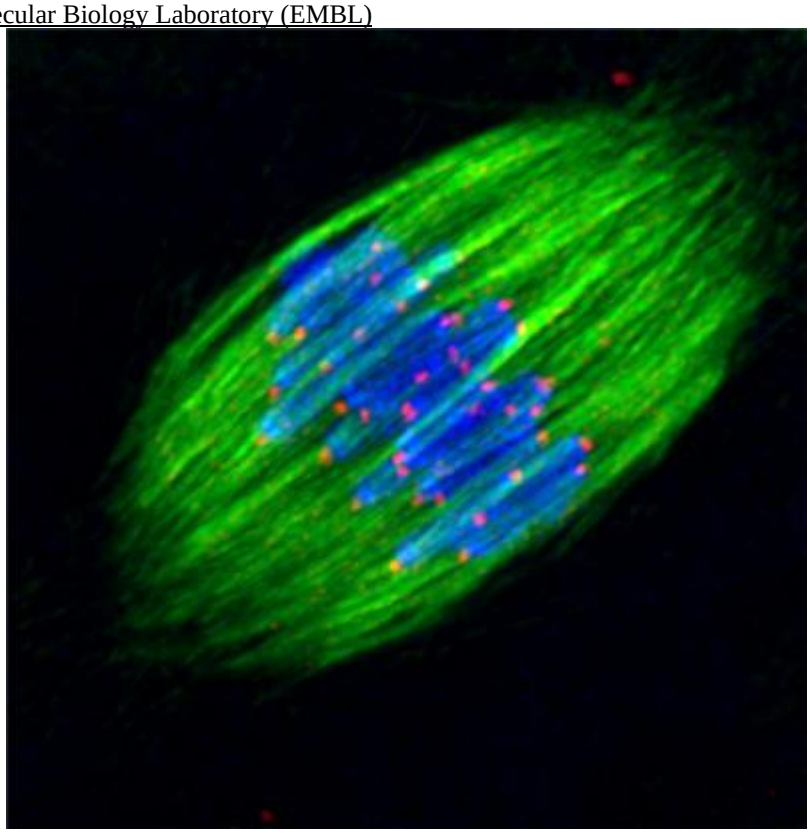
**EASY-HIT: Exploratory Assay SYstem for the discovery of HIV InhibiTors

http://www.helmholtz-muenchen.de/en/press-and-media/press-releases/press-releases-2009/press-releases-2010-detail/article/13868/9/index.html

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91319&CultureCode=en

Better imaging from bench to bedside

02 December 2010 European Molecular Biology Laboratory (EMBL)



Euro-BioImaging will provide open access to state-of-the-art biological imaging techniques like fluorescence microscopy, which produced this snapshot of chromosomes (blue) being pulled apart in a dividing egg. Image credits: EMBL/ T. Kitajima

Euro-BioImaging, a project which launches its preparatory phase today, aims to provide scientists throughout Europe with open access to state-of-the-art imaging technologies at all levels of biological and biomedical research, from bench to bedside.

From microscopy to computer tomography (CT) scans, imaging plays an important role in biological and biomedical research, but obtaining high-quality images often requires advanced technology and expertise, and can be costly. Euro-BioImaging, a project which launches its preparatory phase today, aims to provide scientists throughout Europe with open access to state-of-the-art imaging technologies at all levels of biological and biomedical research, from bench to bedside. The project is part of the European Commission's European Strategy Forum on Research Infrastructures (ESFRI) roadmap.

During the 3-year preparatory phase that starts today, Euro-BioImaging will develop a plan to construct and operate a set of complementary and strongly interlinked imaging infrastructure facilities. This plan will be based on a comprehensive assessment of researchers' needs in terms of access, service, and training. Euro-BioImaging will also establish the legal, governmental and financial framework for such infrastructures, and seek agreements with funding bodies. Eligibility criteria for participating facilities will be defined, an independent evaluation panel will be established, and a call for applications will be announced.

"Euro-BioImaging will support research, training and innovation in biological and biomedical imaging on a pan-European level, by providing imaging services with an overarching strategic plan," says Jan Ellenberg from the European Molecular Biology Laboratory (EMBL), scientific coordinator for biological imaging.

Euro-BioImaging aims to bring together key research areas, from basic biological imaging and molecular imaging to the clinical and epidemiological level of medical imaging. The project intends to address the

current fragmentation of imaging infrastructure in Europe, by creating a coordinated and harmonised plan for its deployment throughout the continent. It will provide scientists in Europe with open access to state-of-the-art imaging technologies and training, continuously developing imaging technologies to offer cutting-edge services to the scientific community.
"Given the broad range of imaging technologies coordinated through Euro-BioImaging, the research infrastructure will facilitate the translation from basic results to medical applications," says Stefan Schönberg from the University Medical Centre Mannheim, Medical Faculty Mannheim, scientific coordinator for biomedical imaging on behalf of the European Institute for Biomedical Imaging Research (EIBIR).
As one of the project's aims is to keep Europe at the forefront of technological innovation in this area, commercial opportunities are expected to arise. To make the most of them when they do, Euro-BioImaging has already started to form an industry board in which all leading vendors and producers of biomedical imaging equipment in Europe are represented.
http://www.embl.de/aboutus/communication_outreach/media_relations/2010/101201_Heidelberg/index.html

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91316&CultureCode=en

A Code for evolutionary biology

02 December 2010 Heidelberg Institute for Theoretical Studies
Alexandros (Alexis) Stamatakis heads the new research group "Scientific Computing" at the Heidelberg Institute for Theoretical Studies (HITS) – Software and supercomputing for large-scale biological data analysis - the program RAxML allows for reconstructing huge phylogenetic trees
His own roots are international: born in Saarbrücken, Alexis Stamatakis was raised by a German mother and a Greek father and received his "Abitur" at the German school in Athens. As a computer scientist, one of his research interests is the evolutionary history of plants, which is quite unusual. But his motivation for that interest is data-driven: He is fascinated by analyzing large trees, because of the associated grand computational challenges that entail problems from theoretical computer science as well as from parallel computing. "Evolutionary biologists are currently generating a molecular data avalanche that is even hard to analyze on the most powerful supercomputers", says the 34 year old scientist. "The challenge for computer science is to develop programs and methods for calculating evolutionary trees and to discover knowledge in the mass of molecular data."

As head of the new research group "Scientific Computing" (SCO) at HITS, Alexis and his students develop methods and tools to reconstruct and post-process evolutionary (phylogenetic) trees. He also works on designing dedicated computer architectures for reconstructing phylogenies. Moreover, he is responsible for the new parallel (super-) computer system that is currently being installed at HITS and shares his expert knowledge in parallel computer architectures and parallel programming with the other five HITS research groups. At present, ten scientists and system administrators form part of SCO.

In 2011 additional PhD students, PostDocs, and visiting scientists will join the group to establish a strong research program in computational molecular evolution. "Alexis is a young, ambitious scientist who stands for the goals and philosophy of HITS. Computational methods help us to cope with the current data flood in the life sciences and to extract new knowledge from this data" says the founder of HITS, Klaus Tschira.

Alexis studied computer sciences at Munich, Lyon (École Normale Supérieure), Paris, and Madrid. In 2004 he received his PhD from the Technical University of Munich. In 2007 and 2008 he declined positions as assistant professor in the US. He worked as a postdoctoral fellow in Crete and the Swiss Federal Institute of Technology at Lausanne. In 2008 Stamatakis returned to Munich where he worked at the LMU and the TU

Munich as head of a junior research group under the auspices of the Emmy-Noether program of the German Science Foundation (DFG).

His primary research objective is to develop tools for reconstructing the evolution of all living beings for which molecular (genetic) data is available, with the still distant goal to reconstruct the tree of life. Most tree reconstruction methods/algorithms face a fundamental problem which computer scientists term NP-hard (non deterministic polynomial time hard). Assume trying to reconstruct the evolutionary history based on the DNA data of fifty organisms using a scoring function (optimality criterion) that tells us how well the data fits a specific evolutionary tree (an evolutionary hypothesis).

NP-hardness means that it is impossible to score all possible trees in order to find the best one, because there are simply too many trees. "Even using all the computing power in the world, we would have to wait too long to find the optimal tree", Alexis explains. "However, recently published phylogenetic trees don't comprise only fifty but several thousands of organisms."

Alexis developed the program *RAxML*, which allows for reconstructing huge trees, of up to 120,000 organisms. By now, his software is one of the most popular applications for phylogenetic analysis and a paper describing *RAxML* ranks among the most frequently cited publications in computer science that were published in the last 5 years. "*RAxML* is publicly available as open source code. Thereby, we provide a tool that biologists around the world can use entirely free of charge to analyze their data." This year, *RAxML* was also integrated into the SPEC-Benchmark suite for parallel computing. The programs in the SPEC benchmark suite are deployed to assess the performance of supercomputer systems.

Alexis is part of the iPlant collaborative project that was initiated by the American National Science Foundation (NSF). iPlant aims to develop and make available new computational methods and cyberinfrastructure solutions to address an evolving array of grand challenges in the plant sciences. Alexandros Stamatakis is the only involved European scientist. The German Science Foundation (DFG) is funding him in conjunction with iPlant. Alexis also is the first computer scientist to be elected as member of the council of the „Society of Systematic Biologists".

Alexis will continue collaborations with several institutions such as the Dunn Lab at Brown University, Rhode Island/USA. Two of His PhD students benefit from an exchange programme with Imperial College London that is funded by the German Academic Exchange Service (DAAD). In cooperation with researchers from the European Molecular Biology Laboratory (EMBL), the European Bioinformatics Institute (EBI), and the University College London, Alexis will organize the 3rd workshop on „Computational Molecular Evolution". It will take place from April 10-21, 2011 at Hinxton, near Cambridge/UK. This workshop introduces Biologists to the usage and underlying theory of computational tools for evolutionary data analysis. http://www.h-its.org/english/research/sco/index.php

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91310&CultureCode=en

Team from Festo and Fraunhofer IPA wins: "Deutscher Zukunftspreis 2010”

02 December 2010 Fraunhofer-Gesellschaft
The elephant skillfully uses his trunk to lift an apple from the ground. Carefully, he surrounds it with the tip of the trunk and lifts it high above his head before placing it gently into the hand of his keeper. There are roughly 40,000 muscles that make the elephant‘s trunk an extremely flexible gripping hand that can move freely in any direction and can even rotate. An ingenious tool – flexible, powerful and yet sensitive. A similar level of flexibility and gentle performance is provided by the high-tech trunk developed by researchers at the Festo company, working together with colleagues at the Fraunhofer Institute for Manufacturing Engineering and Automation IPA. With three ‘fingers’ the high-tech version cautiously lifts a raw egg from the hand of developer Peter Post before gingerly passing it along to Markus Fischer – almost as elegantly as its biological model.
The delicate and flowing movements are made possible by the sophisticated design of the bionic handling assistant. "The plastic trunk is made of bellows structures arrayed in series, a movable hand axis and a grabber with three fingers," explains Dr. Post, who heads up the research and development project at Festo. The structural elements are flexible and can be manipulated using compressed air. If air is pumped into the trunk, the bellows structures extend as an accordion would. This is how the high-tech trunk can be extended from 70 to 110 centimeters in length.
The three fingers fitted to the trunk are also designed with a biological model in mind – the tail fin of a trout. The special feature: if you press these "FinGrippers" lightly with your finger, rather than retract in the direction of the pressure, they respond by moving toward the source of pressure.
The individual structural elements of the flexible arm are produced in additive manufacturing. This makes the plastic trunk especially light and soft. Working directly from design data, the components of the high-tech trunk are built up layer by layer, using fine polyamide powder. "A pinpoint laser beam applies heat to melt the powder at the specified spots. Essentially, it all works much the same way as a printer, just in three dimensions," explains Andrzej Grzesiak of IPA. The major benefit: arbitrarily complex geometries and inner structures can be created with "additive manufacturing" There is no need for assembly anymore – the components are formed in a single work step.
Although it weighs just 1.8 kg, the flexible arm can lift up to 500 g. By way of comparison: conventional industrial robots can only move roughly one tenth of their own weight. Another benefit of this novel "third hand": the system is particularly light and flexible because – unlike the classic robot – it is made of plastic

instead of metal and works with compressed air. This allows a unique kind of teamwork between man and technology. "At the moment, working near dynamically active machinery is dangerous. Our goal was to create a handling system that is inherently pliable – so that people can work with this system without any risks at any time," notes Markus Fischer, head of corporate design at Festo. The "third hand" can be used wherever people require mechanical support – as packaging sensitive goods or in a car repair shop, in rehabilitation or even in the household.
For their work in developing the "elephant's trunk – a high-tech helper for industry and domestic use," Dr.-Ing. Peter Post, Dipl.-Ing. Markus Fischer and Dipl.-Ing. (FH) Andrzej Grzesiak have been awarded the Deutscher Zukunftspreis 2010. The German Federal President Christian Wulff honored the scientists with the award on December 1. The prize carries a cash value of EUR 250,000 .

http://www.fraunhofer.de/en/press/research-news/2010/12/Deutscher-Zukunftspreis-2010.jsp

Smoking May Thin the Brain

02 December 2010 Elsevier
Many brain imaging studies have reported that tobacco smoking is associated with large-scale and wide-spread structural brain abnormalities.
The cerebral cortex is a specific area of the brain responsible for many important higher-order functions, including language, information processing, and memory. Reduced cortical thickness has been associated with normal aging, reduced intelligence, and impaired cognition. However, prior research had not described the impact of smoking upon cortical thickness.
A new study, published in the current issue of *Biological Psychiatry*, now reports concerning findings about the impact of smoking.
Researchers compared cortical thickness in volunteers, both smokers and never-smokers, who were without medical or psychiatric illnesses.
Smokers exhibited cortical thinning in the left medial orbitofrontal cortex. In addition, their cortical thickness measures negatively correlated with the amount of cigarettes smoked per day and the magnitude of lifetime exposure to tobacco smoke. In other words, heavier smoking was associated with more pronounced thinning of cortical tissue.
The orbitofrontal cortex has frequently been implicated in drug addiction. The current findings suggest that smoking-related cortical thinning may increase the risk for addictions, including smoking.
"Since the brain region in which we found the smoking-associated thinning has been related to impulse control, reward processing and decision making, this might explain how nicotine addiction comes about," explained Dr. Simone Kühn. "In a follow-up study, we plan to explore the rehabilitative effects of quitting smoking on the brain."
"The current findings suggest that smoking may have a cumulative effect on the brain," noted John Krystal, M.D., Editor of *Biological Psychiatry* and Professor and Chair of Psychiatry at Yale University. "This concerning finding highlights the importance of targeting young smokers for antismoking interventions." For now, this study adds to a long and ever-growing list of reasons that smokers should consider quitting.
Full bibliographic information"Reduced Thickness of Medial Orbitofrontal Cortex in Smokers" by Simone Kühn, Florian Schubert, and Jürgen Gallinat. Kühn and Gallinat are affiliated with St. Hedwig Krankenhaus, Clinic for Psychiatry and Psychotherapy, Charité University Medicine, Berlin, Germany. Kühn is also affiliated with the Faculty of Psychology and Educational Sciences, Department of Experimental Psychology and Ghent Institute for Functional and Metabolic Imaging, Ghent University, Ghent, Belgium, and also the Institute of Cognitive Neuroscience, Department of Psychology, University College London, London, United Kingdom. Schubert is with Physikalisch-Technische Bundesanstalt, Department of Medical Metrology, Berlin, Germany.
The article appears in Biological Psychiatry, Volume 68, Number 11 (December 1, 2010), published by Elsevier.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91268&CultureCode=en

People with a university degree fear death less than those at a lower literacy level

02 December 2010 University of Granada
A research -conducted at the University of Granada- revealed that fear of death is most common among women than men. Additionally, it concluded that parents' fear of death affects their children's perception of death. A change of mentality regarding this topic is necessary among families and teachers, since it is key to children's mental health and psychological development
People with a university degree fear death less than those at a lower literacy level. In addition, fear of death is most common among women than men, which affects their children's perception of death. In fact, 76% of children that report fear of death is due to their mothers avoiding the topic. Additionally, more of these children fear early death and adopt unsuitable approaches when it comes to deal with death.
These are some of the conclusions drawn from a research entitled *Educación para la muerte: Estudio sobre la construcción del concepto de muerte en niños de entre 8 y 12 años de edad en el ámbito escolar, [Education On Death: A Study On The Building Of The Concept Of Death In Children Aged Between 8 And 12 At School]* conducted at the Department of Personality, Assessment and Psychological Treatment at the University of Granada by Claudia Fabiana Siracusa, and led by professors Francisco Cruz Quintana y Mª Nieves Pérez Marfil.
For the purpose of this study, researchers took a sample of 288 children, aged between 8 and 12, including their parents, tutors and teachers. The professors at the University of Granada analysed how adults' understanding of the concept of death affects children's attitudes, fears, beliefs and approaches to death.
A change In Mentality
This study revealed the need for a change in mentality within families and at school, regarding death and the end of life. The reason is that an appropriate approach to death is key to children's health and personality.
Other conclusions were that all children –to a higher or lower degree- have had experiences related to death, that they believe in life after death, and that they are concerned about it. Additionally, it is more common among girls to believe in life after death than among boys.
As regards teachers, 80% of them reported that death was not included in the curriculum. Six out of ten recognised that they have occasionally talked about death with their students, mostly due to the death of a students' relative.
In the light of the results obtained, University of Granada researchers consider that it is essential to provide death education *"as a way to value life, and an instrument to end with the misguided and unreal idea transmitted by the media. Such education would provide children with the appropriate strategies and resources to approach death during their lives, avoiding any slight or severe negative impact on their physical or psychological health."*
Another finding was that a high educational level prevents negative attitudes, as fear of death and avoiding the topic. In accordance with the teachers that participated in the study, *"at present, the education system does not have any formal and systematic method to deal with death in class. If death were introduced in the education system, children would have a more real and intense approach to life, and many of the problems derived from the mourning process in the adulthood would be prevented."*
The results obtained will be partly published in a book that will be released soon.
http://canalugr.es/social-economic-and-legal-sciences/item/45208

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91274&CultureCode=en

Yoga could help improve prison environment - new study

02 December 2010 Leicester, University of

New research at the University of Leicester is examining the potential of yoga to benefit prisoners and staff – by helping them get in touch with their spiritual side.

Former probation officer Rose Parkes is assessing the role of yoga in prisons as part of her PhD at the University of Leicester Department of Criminology. She will make a presentation about her research on December 8.

In her research Rose, who is a British Wheel of Yoga teacher, discusses the way in which spiritual activities can empower and motivate prisoners to survive their incarceration.

Rose is investigating whether yoga enables individuals to adjust to the prison environment and post-prison life. She comments: "I believe that prisoners can benefit from yoga because it is a practice which helps to foster understanding, self-acceptance, peace and wellbeing."

In addition, the study aims to discover whether prisoner yoga practices can help prisons achieve the HMIP 'healthy prison' criteria set out by the Government in 2008 after concerns about prison conditions. These criteria are particularly concerned with eliminating suicide, self-harm and violence in prisons.

Whilst working as a part-time Probation Officer, Rose witnessed the effectiveness of the technique at forming positive relationships with other offenders, prompting the study to ascertain whether yoga can help people cope with incarceration.

She added: "Prisons are highly stressful environments and yoga may offer prisoners a much needed physical and mental release of the tension of prison life, paradoxically turning prison cells into places of retreat, where prisoners can develop self-discipline and concentration skills.

"If prisoners are better equipped to deal with their emotions, particularly fear and anger, then, I believe, they are less likely to harm themselves or others. This can only be of long-term benefit to society."

Through participant observation, in-depth interviews and documentary analysis she hopes to demonstrate yoga's ability to improve prisoner wellbeing. She realises the potential for yoga to connect prisoners in a non-threatening manner, declaring: "The ability of yoga to build 'social capital' is, I believe, another great benefit arising from the practice."

The current political drive to reduce prison populations and to revitalise rehabilitation agendas, reflects the timeliness of this research.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91265&CultureCode=en

Medical e-books: A time for reading
02 December 2010 SEEd Medical Publishers

- **Publication title:** SEEd's e-books collection
- **Author:** SEEd
- **Publication type:** Other

SEEd Medical Publishers launches its new e-books
SEEd Medical Publishers announces the availability of its English e-books: a new formula of access to practical medical contents for physicians, teachers, researchers, and students.
The e-books are best suited for research purposes: they don't need to be read cover-to-cover, but can be approached as a resource for finding answers to a specific clinical question. Furthermore, compared to the printed edition, e-books have a lower price.
But the most important advantage of SEEd's e-books is their interactivity: they not only offer additional features such as free-text searching, and interactive links, but are completed by downloadable tools, such as software and calculators, which have been studied to be useful to those on the front line of medical care.
Highlights from SEEd's e-books collection:

- *Paediatric Hypertension*. A tool to diagnosis and manage hypertension in children. The e-book includes a software that allows hypertension assessment: entering the data about sex, height, systolic and diastolic pressure, the program indicates the presence and severity of hypertension.
- *Paediatric Obesity. Not only a weight concern*. Recommendations for adequate treatment of obesity and overweight in children and adolescents, based on the American Academy of Pediatrics (AAP) guidelines. The e-book includes a BMI-percentile-for-age calculator that supplies the right treatment strategy in accordance with AAP guidelines.

- *Drugs and Laboratory Parameters*. A useful guide to detect drugs interference in the analytical process. Over 700 drugs and more than 80 laboratory tests are described. The e-book allows a quick search for active principle, laboratory parameter, or disease.
- *Applied Epidemiology and Biostatistics*. Using a step by step approach, and through many practical examples, the book gives the reader the possibility of conducting an epidemiological or a statistical analysis. In fact, each chapter presents one or more specific examples on how to perform an epidemiological or statistical data analysis, and the e-book edition includes download access to the software and databases, giving the reader the possibility of replicating the analyses described.

http://www.edizioniseed.it

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Soya beans could hold clue to treating fatal childhood disease

02 December 2010 Manchester, The University of
Scientists from The University of Manchester say a naturally occurring chemical found in soy could prove to be an effective new treatment for a fatal genetic disease that affects children.
Dr Brian Bigger, from the University's MPS Stem Cell Research Laboratory, found that genistein – derived from soya beans and licensed in the US as an osteoporosis drug – had a dramatic effect on mice suffering from the human childhood disease Sanfilippo.
"Sanfilippo is an untreatable mucopolysaccharide (MPS) disease affecting one in 89,000 children in the United Kingdom," said Dr Bigger, who is based in the School of Biomedicine.
"Children with Sanfilippo disease experience progressive deterioration of mental function, similar to dementia, in early childhood, with other symptoms including severe behavioural problems, hyperactivity and ultimately death in early teens."
In the study, published in the journal *Public Library of Science One*, mice with Sanfilippo disease were fed with high doses of genistein over a nine-month period. Treated mice showed a significant delay in their mental decline, including a third reduction in the amount of excess sugars found in the brain as a result of the disease, and a sixth reduction in inflammation in the brain.
Importantly, the research, carried out with colleagues at St Mary's Hospital in Manchester, also showed that the hyperactivity and other abnormal behaviour normally seen in Sanfilippo mice were fully corrected by genistein treatment.
Professor Wraith, a co-author on the study and consultant paediatrician from Genetic Medicine in St Mary's Hospital, said "Sanfilippo is a disease where the genetic lack of an enzyme leads to a fault in the breakdown of complex sugars in the cell.
"This leads to storage of these undegraded complex sugars in cells, disturbances in brain function and ultimately to this profound mental deterioration that we see in the children with this condition. Manchester is a specialist centre for this type of genetic disease and as such we look after more than 100 patients from all over the UK and beyond."
The Manchester team, supported by the UK society for mucopolysaccharide diseases and the Manchester Biomedical Research Centre, hope to announce a placebo controlled clinical trial for patients with Sanfilippo disease in the near future.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91235&CultureCode=en

Deutsches Ärzteblatt International

The Race Against Age

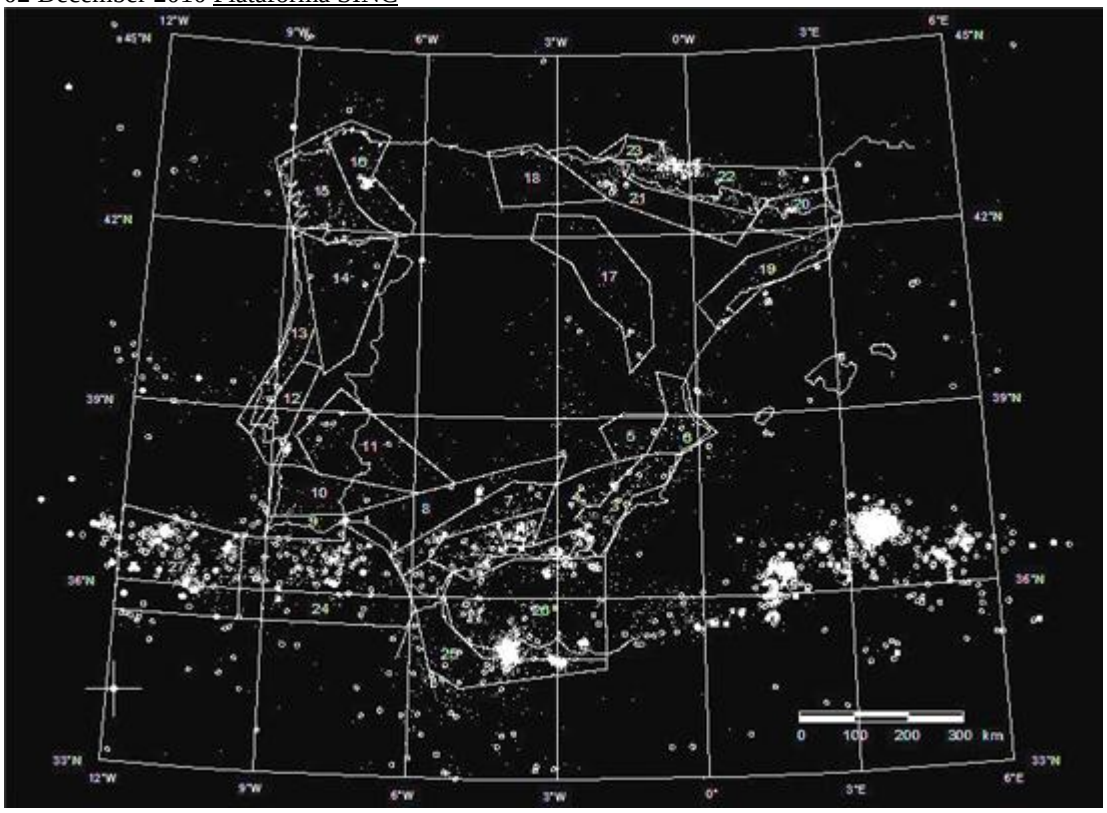
02 December 2010 Deutsches Aerzteblatt International
Impairments to health and physical performance are not primarily a result of aging but of unfavorable lifestyle habits and lack of exercise. This is the position taken by Dieter Leyk and his coauthors in the new issue of *Deutsches Ärzteblatt International* (Dtsch Arztebl Int 2010; 107[46]: 809–16).
Sporty elderly people have a life expectancy that is almost 4 years higher and are often faster than younger athletes.
In their study, the sports scientists analyzed the stamina of more than 600 000 marathon and half marathon runners and asked participants about their lifestyle habits and their health. Marathon running is particularly suitable for studying because participants have to put in sufficient training hours for the competition, and the athletes accommodate this into their day accordingly.
Unfavorable characteristics such as obesity, smoking, and lack of physical activity are rarer in runners, and reductions in physical performance are more likely to be the result of biological aging processes. These reductions make their presence felt only after the 54th year of life and are but slight. More than 25% of 50- to 69-year-olds had taken up running only in the preceding 5 years and participated in a marathon nonetheless.
Of note: older participants do not have to train any harder to maintain their fitness than their younger rivals.
http://www.aerzteblatt.de/v4/archiv/pdf.asp?id=79256

- **Full bibliographic information**Leyk D, Rüther T, Wunderlich M, et al.: Physical performance in middle age and old age: good news for our sedentary and aging society. Dtsch Arztebl Int 2010; 107(46): 809–16. DOI: 10.3238/arztebl.2010.0809

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91232&CultureCode=en

Researchers Find Mathematical Patterns to Forecast Earthquakes

02 December 2010 Plataforma SINC



Results to be published this month in the journal 'Expert Systems with Applications'

Researchers from the Universidad Pablo de Olavide (UPO) and the Universidad de Sevilla (US) have found patterns of behaviour that occur before an earthquake on the Iberian peninsula. The team used clustering techniques to forecast medium-large seismic movements when certain circumstances coincide.

"Using mathematical techniques, we have found patterns when medium-large earthquakes happen, that is, earthquakes greater than 4.4 on the Richter scale," Francisco Martínez Álvarez, co-author of the study and a senior lecturer at the UPO revealed to SINC.

The research, which will be published this month by the journal Expert Systems with Applications, is based on the data compiled by the Instituto Geográfico Nacional on 4,017 earthquakes between 3 and 7 on the Richter scale that occurred on the Iberian Peninsula and in the surrounding waters between 1978 and 2007.

The scientists applied clustering techniques to the data, which allowed them to find similarities between them and discover patterns that will help to forecast earthquakes.

The team concentrated on the two seismogenic regions with the most data (The Alboran Sea and the Western Azores-Gibraltar fault region) analysing three attributes: the magnitude of the seismic movement, the time elapsed since the last earthquake and the change in a parameter called the b-value from one earthquake and the other. The b-value reflects the tectonics of the region under analysis.

A high b-value means earthquakes are predominantly small in size and, therefore, the land has a low level of resistance. In contrast, a low value indicates that there are a relatively similar number of large and small

seismic movements, which implies the land is more resistant.

Successful Forecast Probability Greater than 80%

"We have discovered the strong relationship between earthquakes and the parameter b-value, recording accuracy rates of more than 80%," Antonio Morales Esteban, another of the co-authors of the study and a senior lecturer at the US highlighted. "After the calculations had been performed, providing the circumstances and sequences we have determined to be forerunners occur, we obtain a significant success probability".

The technique summarises the forecasts in two factors: sensitivity (probability of an earthquake occurring after the patterns detected occur) and specificity (probability of an earthquake not occurring when no patterns have occurred).

The results reflect a sensitivity of 90% and specificity of 82.56% for the Alboran Sea region and 79.31% and 90.38% respectively for the seismogenic region of the Western Azores-Gibraltar Fault.
That is, there is a high probability of an earthquake in these regions immediately after the patterns discovered occur (high sensitivity) and, moreover, on most of such occasions, they only occur after the patterns discovered (high specificity).

At present the team is analysing the same data using their own algorithms based on "association rules", other mathematical techniques used to discover common events or those which fulfil specific conditions within a set of events.

"The results are promising, although I doubt we will ever be able to say that we are capable of forecasting an earthquake 100% accurately," Martínez Álvarez conceded.

Áreas sismogénicas de España y Portugal. El estudio se ha centrado en las áreas 26 y 27.
Imagen: Martínez-Álvarez et al.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91223&CultureCode=en

Brain Imaging Studies Show Different Cultures Have Different Brains

The emerging field of cultural neuroscience reveals fascinating differences in brain function between cultures and environments. Christie Nicholson reports
November 27, 2010

Did you know that our brain function is entirely different when we think about our own honesty versus when we think about another's honesty? That's if the "we" is American. For Chinese people their brains look identical when considering either.
These sorts of studies fall into so-called cultural neuroscience: the study of how our environment shapes our brain function.

Following up on the cultural differences between Asians and Americans, one study published in *Neuroimage* found that when faced with the same image, people's neural responses are totally different. Scientists found that when American subjects viewed a silhouette in a dominant posture (standing up, arms crossed) their brain's reward circuitry sparked. Not so for Japanese subjects. For the Japanese, their reward circuitry fired when they saw a submissive silhouette (head down, arms at sides). This physiological response matches a well-known behavioral difference: Americans favor and encourage dominant behavior. Japanese culture reinforces submissive culture.

This study, and many others, is referenced in a recent article in the *American Psychological Association's Monitor*.

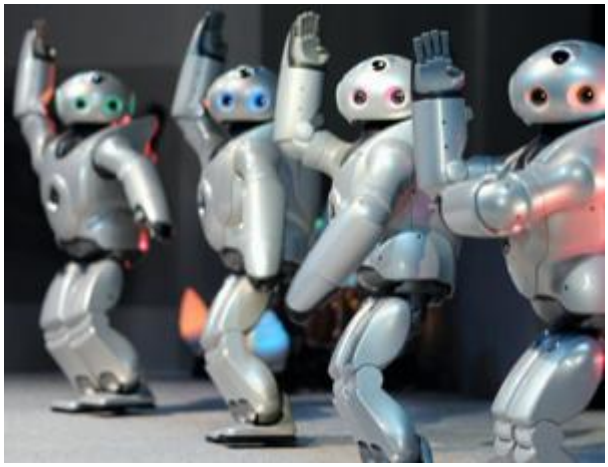
One might think, well, these studies add nothing revolutionary and are simply revealing the wiring behind already well-known behavior. Then again isn't it a good thing for science to understand the wiring behind a light bulb instead of just observing that it goes on when someone walks into a room?

—Christie Nicholson

http://www.scientificamerican.com/podcast/episode.cfm?id=brain-imaging-studies-show-differen-10-11-27

In our own image: Why we treat things like people

- 29 November 2010 by **Douglas Fox**
- Magazine issue 2788.



One step closer to being human-like (Image: Yoshikazu Tsuno/AFP/Getty)

Cursing computers, talking to plants, even putting pigs on trial: anthropomorphism may be irrational, but it's how we cope with an indifferent world

IT WAS a classic open-and-shut case. As Jehan Martin slept in his bed an intruder crept in, killed him and mutilated his body. Witnesses had seen a female enter the house on the day of the attack. She was subsequently taken into custody and tried in court. The trouble was the perpetrator happened to be a pig.

Historical records document at least 200 trials in which an animal was the principal defendant. So this case in 1457 is by no means an isolated incident. The accused were often assigned lawyers and confined to jail during trials. Occasionally they were acquitted - a donkey on trial for lewd sexual acts, for example, was freed after loyal supporters testified that she was "in all her habits of life a most honest creature". When these animals were found guilty, however, they were usually hanged like a human criminal.

As rational, educated people, it's easy to smirk at attempts to try animals in a court of law - but one should not be too hasty. After all, the people involved were falling prey to an irrational trait that afflicts us all from time to time: they were anthropomorphising.

Maybe you talk to your plants, name your car, or shout at your computer from time to time. Or perhaps you believe in a personified God. "We are hard-wired to see human-like beings everywhere," says Stewart Guthrie, an anthropologist at Fordham University in New York City who has documented the rampant anthropomorphism in the world's religions.

Despite its prevalence in human life, this bizarre trait had largely been ignored by credible scientists until very recently. Now the study of anthropomorphism is booming, with new work revealing how and why our brains are compelled to do it. It turns out the phenomenon has far-reaching effects on human behaviour, explaining why gamblers or traders on the stock market are inclined to push their luck too far, for example. And the work might just help engineers design a variation of Microsoft's office assistant "Clippy" that you don't want to strangle.

There's no doubt that anthropomorphism is ingrained in human nature. Some of the oldest known pieces of cave art show figures who are half-human, half-animal, suggesting the trait may have been present in our ancestors at least 30,000 years ago. Since then, anthropomorphic figures have been ubiquitous in folk-lore and religion, and many of them are still going strong. Think Jack Frost, Mother Nature and, of course, God.

Ancient civilisations were well aware of this strange quirk of human psychology. Xenophanes, a philosopher in ancient Greece, coined the term anthropomorphism 2600 years ago. He observed that people worshipped gods that resemble themselves: Greeks kowtowed to white-skinned gods, while the Ethiopians preferred theirs a bit darker. From this observation, he predicted that if horses and donkeys believed in gods, theirs would trot

on four legs. He may have had a point. Primatologists have documented a curious behaviour in chimpanzees, called the "rain dance": when a thunderstorm blows in, they sometimes climb trees, tear off branches, and brandish them while screaming at the clouds - as if confronting a rival male. Those primates may well be "chimpomorphising" the storm - shaking their sticks at the hairy-knuckled Zeus who is hurling lightning bolts from the great treetop in the sky.

Apes 'chimpomorphise' a storm when they shake their sticks at a hairy-knuckled Zeus in the sky

Anthropomorphism had been somewhat overlooked by modern psychologists, until about 10 or so years ago, when a couple of trends in psychological research finally put the trait under the spotlight. For one thing, the psychology of religion has become increasingly fashionable, leading some researchers to question why most faiths feature human-like gods. And the growing popularity of avatars in virtual environments like Second Life has prompted greater interest in the ways in which we interact with non-human entities.

First of all, psychologists studying the phenomena wanted to establish exactly what is going on in our brain when we anthropomorphise. Nicholas Epley, a social psychologist at the University of Chicago's Booth School of Business, had some ideas. He had studied our tendency to think egocentrically, meaning that we use our own preferences to predict how someone else will react to a dirty joke or a present. "It's a well-known contributor to buying bad gifts," says Epley. The next logical step was to question whether we also use our mind as a starting point for divining the "thoughts" of non-humans too. So in 2004, Epley and John Cacioppo, also at the University of Chicago, decided to test the idea.

The duo asked a group of volunteers to think about their own beliefs, other peoples' beliefs, and God's beliefs on issues like capital punishment, while the researchers viewed their brain activity with a functional MRI scanner. As you might expect, given Epley's earlier work, the brain activity was pretty similar when the subjects considered their own or another human's views. But the closest resemblance came when the subjects thought about God's views - here, the brain activity was virtually identical to the scans taken when the subjects thought about their own viewpoint. This was reflected in their own reports, when they told the researchers that they considered their own beliefs to be much closer to God's than to those of Bill Gates or George W. Bush, for example.

The results, published last December in *Proceedings of the National Academy of Sciences* (vol 106, p 21533), might simply confirm that some people use the idea of God to elevate their own beliefs, titillating themselves with the knowledge that those who disagree with them will spend eternity burning in hell. To Epley it signified something more profound: the less evidence we have of another's beliefs - and for God we have very little indeed - the more likely we are to project our own beliefs into the voids. The same probably applies to anything else to which we attribute a personality or mind of its own, such as our car, our plant or our pet.

Further evidence that we use the same neural processes to understand the behaviour and minds of both humans and anthropomorphic entities came with brain scans by Christian Keysers, a social neuroscientist at the University Medical Center Groningen in the Netherlands. Under an fMRI scanner, his volunteers viewed two movies - one in which two people pushed or chased each other around, and another in which the people were replaced with a circle and square. Both movies activated the "mirror neuron system" in the viewers' premotor and somatosensory cortices - brain areas that respond to action by other humans and help us interact socially. "The brain areas activated were virtually indistinguishable," says Keysers. "People found that these geometric shapes were pushing each other around very intentionally."

Bolstered by this convincing evidence that our brains really do consider inanimate objects in the same ways as they consider other human beings, the researchers decided to investigate the reasons why we might have evolved the trait in the first place.

One of the most obvious explanations is that it's an attempt to make sense of a largely meaningless world. Humans have a habit of looking for useful cues in nature, even when they are not there, since the pay-off is huge in the few cases when there is cause for concern. We may be on guard whenever we hear rustling in the bushes, for example, even though the sound may be insignificant 99 times out of 100, simply because it might save our life in the one instance that it really does signal a predator intent on eating us. Many superstitions appear to be an extension of this behaviour (*New Scientist*, 4 February 2009, p 30) and anthropomorphism may be no different. "I wouldn't say that the anthropomorphism itself is adaptive," says Guthrie. "It's mistaken by definition. But the strategy that leads to it is totally adaptive."

Predicting the unpredictable

Consistent with this hypothesis, Cacioppo, Epley, and their former PhD student Adam Waytz, now at Harvard University, recently found that we are more likely to anthropomorphise when faced with unpredictable situations or entities. For example, their subjects were more likely to assign intentions, consciousness and emotions to unpredictable devices like Clocky, an alarm clock that wheels itself onto the floor and runs away as the alarm goes off, making it difficult to catch and press the snooze button. fMRI scans supported this finding, showing that thinking about unpredictable gadgets like Clocky leads to greater activation of the ventromedial prefrontal cortex - a brain area known to be involved in thinking about other peoples' thoughts (*Journal of Personality and Social Psychology*, vol 99, p 410). This tendency even runs to desktop computers, with the team finding that we are more likely to consider that our PC has a mind of its own if it freezes up unexpectedly.

It's also evident in the way we react to natural disasters. "When there's human suffering or an earthquake," says Waytz, "it can provide people with a sense of meaning to attribute them to the intentions of God or Mother Nature." And in the case of those townspeople in 15th-century France, putting a pig on trial for murdering a child may have provided them with a sense of control by imposing human standards of behaviour on an amoral animal kingdom.

Our attempts to explain the unexplainable are unlikely to be the whole story, though. Anecdotal reports suggest that lonely people anthropomorphise more than those with a buzzing social life, leading Cacioppo and Epley to wonder whether it might also be a coping mechanism to deal with social isolation. "If you can't connect to people, [maybe] you connect inferentially to dogs or gadgets or gods," says Cacioppo. The idea is certainly fixed in pop culture. Think of the movie *Cast Away*, in which Tom Hanks's character, stranded on a desert island, draws a human face on a volleyball and names it "Wilson". People have even been known, in rare cases, to fall in love with and "marry" landmarks such as the Eiffel Tower or the Berlin Wall; one could speculate that they're looking for intimate connections, albeit in a maladapted fashion.

Cacioppo, Epley, and Waytz set out to test the loneliness hypothesis. They presented subjects with descriptions of consumer gadgets such as Pillow Mate (a pillow that hugs you back) and Clocky, and asked people to rate them on human qualities such as "has a mind of its own". As expected, those who saw the most human-like traits in Clocky and its ilk were the ones who showed greater signs of loneliness in personality surveys.

In a further experiment, they showed volunteers several movie clips, including a scene from *Cast Away* depicting loneliness, and then asked them to describe God or their pet. People who had just watched the lonely scene rated their pets and God as higher on supportive, person-like traits such as "thoughtful", "considerate", or "sympathetic" compared with people who watched other scenes.

"These are not people whom I would clinically diagnose as being upset," says Waytz, who published the results with Epley and Cacioppo in *Psychological Science* in 2008 (vol 19, p 114). "What it says is that anthropomorphism is a very natural response to being just temporarily isolated."

At first glance, this could seem to be somewhat damaging, since finding kinship in your car might keep you from seeking out real friends when you need them. "It's a little bit like eating celery when you're hungry," says Cacioppo. "There's nothing nourishing in it." But when you consider the negative biological effects of loneliness, there could also be a very real upside to blunting these bad feelings. Social isolation shortens lifespan in humans and fruit flies alike, and studies of prisoners in solitary confinement demonstrate that our social brain can unravel over weeks and months, leading to long-term difficulties in building relationships afterwards. Maybe anthropomorphism is one of the brain's efforts to minimise these effects. "It allows people to sort of tread water while searching for that real sense of connection," says Waytz. "In that sense it's certainly adaptive to reduce stress."

All of which shows that anthropomorphism is an innate characteristic of human psychology, suggesting it could have far-reaching and unexpected effects on our behaviour. Beyond the obvious superstitions and quirks, however, few of these effects had been documented, so the researchers set about examining the possible situations in which we might anthropomorphise, and its consequences.

Our interactions with technology turned out to be one of the most promising lines of investigation. Engineers have long assumed that we prefer devices if they resemble humans, and there is some evidence to support this view. Combining human-like looks with unpredictability, for instance, turns out to be a potent mix for anthropomorphism that makes robots particularly engaging. In one study, toddlers went wild over a walking and dancing robot when it was difficult to tell what the device would do next. Significantly, they treated it like

a human playmate - watching it, touching it frequently, and putting a blanket over it when it laid down as though it were sleeping. When the robot was reprogrammed to repeat its acts at regular intervals, however, it lost its anthropomorphic allure, and the children largely ignored it (*Proceedings of the National Academy of Science*, vol 104, p 17954).

Yet there is now a growing realisation that anthropomorphised devices also have their pitfalls. People often feel disproportionately angry, for example, when their computer freezes, hitting or shouting at the device. This irrational anger arises because people feel that they've established a partnership with the machine, says Clifford Nass, a psychologist of human-computer interaction at Stanford University in California. "We feel like it should be on our side," he says. "It's a betrayal of our trust." Similar factors might also explain the demise of Clippy, the infamous animated assistant in early versions of Microsoft Office (see "R.I.P. Clippy").

The best approach, says Nass, is to create an anthropomorphic interface with a bit of tact and diplomacy. He recently studied how customers interacted with Amazon.com's telephone voice-recognition system. These systems can be intensely irritating when they don't recognise what we say, but people responded best when the computer blamed a crackly phone line rather than itself or the caller. The customers were more willing to repeat their answer, stay on the phone and buy books. It worked, says Nass, because the response implied the computer was trying hard, without making it seem too stupid.

Lucky streaks

Away from technology, anthropomorphic figures can make us behave ourselves when no one else is looking (see "Someone to watch over me"). Anthropomorphism can also determine, to a certain extent, our views on environmental matters, abortion or animal rights - all depending on the kinds of characteristics we bestow on the beings in question.

The phenomenon is especially rampant in high-risk, unpredictable situations like gambling or trading on the stock market, precisely the time when we would like to keep our wits about us. Michael Morris, a social psychologist at Columbia University's business school in New York, recently examined the way that television commentators use volitional terms to describe the stock market - they might say the prices "climbed higher" or "flirted with the 2000 mark". Reviews of TV transcripts showed that commentators were more likely to use volitional terms if the market was on a streak-that is, if it had just fallen or risen substantially (*Organizational Behavior and Human Decision Processes*, vol 102, p 174). This kind of subtle anthropomorphism can be dangerous for investors. Waytz, Epley, and their Booth colleague Eugene Caruso found that people who see volition behind a streak (say, a steadily rising stock or a string of red numbers in roulette) are more likely to believe that the streak will continue (*Cognition*, vol 116, p 149). By causing people to believe that a stock's price will keep rising, this dynamic can perversely push investors to buy when the price is high rather than when it's low.

Anthropomophism is especially rampant in high-risk situations like gambling

To make matters worse, these effects could have their biggest impact when we are already feeling particularly cocky, as Ann McGill, also at the Booth School of Business recently discovered when she presented some volunteers with two groups of slot machines - half of which looked somewhat human-like.

Those who felt more socially powerful were more likely to play with the anthropomorphised slot machines than those who felt shyer. "Nobody would look at a slot machine and say 'I can talk it into letting me win'," says McGill. "But if they're feeling kind of powerful... they may start leaning toward the direction of thinking 'I can probably get my way'." This dynamic could embolden a trader or gambler to feel that they have more control than they really do - leading them to take excessive risks.

The biggest irony, however, emerges when you compare the trait with the way that humans often treat each other. Since lonely people seem more likely to see human qualities in inanimate objects, for instance, Waytz and his colleagues wondered if the opposite would be true: do socially connected people fail to see the humanity in real people? His early experiments have found exactly that.

People who had just recalled a family holiday, making them feel more socially secure, were more prone to endorse harsh interrogation techniques such as waterboarding and electric shock than other people. Since uncertainty also seems to trigger anthropomorphism, he predicts that feelings of power and security might also make us see other people as objects rather than human beings. "Both of those psychological factors put people in a mindset where they're licensed to dehumanise [others]," says Waytz.

Maybe we're no more rational than those pig-arresting townspeople in 15th-century France after all.

R.I.P. Clippy

Attempts to anthropomorphise technology backfired spectacularly in Clippy, the puppy-eyed paper clip that used to pop up sporadically in Microsoft Office to say things like: "It looks like you're writing a letter - can I help you?" Radio skits portrayed Clippy being led into the woods for a gang-style execution as he cheerfully asked, "It looks like you're digging a grave - is this a personal grave or a business grave?"

We disliked Clippy because it seemed to be a busybody, and made us feel less in control. Worse still, it popped up uninvited. This unpredictability may have made Clippy more human-like but it's a bad trait when all you want to do is type up a report so you can leave the office and catch a train home. "Results showed again and again that the distraction was huge," says Ben Shneiderman, a computer scientist at the University of Maryland in College Park. "The users' performance was worse in that it took them longer to complete the task."

Even on the rare occasions that Clippy did provide useful advice, it backfired in another way: users tended to credit the computer for their success, rather than themselves, reducing their personal satisfaction (*Interacting with Computers*, vol 19, p 293).

Someone to watch over me

We know that humans are more likely to behave themselves under supervision - but what if the supervisor has no mind of its own? Researchers at the University of California in Los Angeles studied people's behaviour in an anonymous economic game under two situations, one with a normal computer screen and another with two cartoon eyes staring out of the screen. When the eyes were present, people showed more generosity to other players - even though they were still completely anonymous (*Evolution and Human Behavior*, vol 26, p 245).

Most people care so deeply about what others think of their actions that the mere appearance of a face can evoke that feeling and influence behaviour, says Waytz, as if they really were being watched.

This effect has been put to powerful effect throughout history, with statues of Jesus, Buddha and the Virgin Mary appearing in countless public places, and the faces of rulers like Chairman Mao, Kim Jong Il, or Saddam Hussein plastered on the sides of buildings. "Good propaganda really takes advantage of the fact that humans are sensitive to what others are thinking," says Waytz.

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http://www.newscientist.com/article/mg20827881.400-in-our-own-image-why-we-treat-things-like-people.html?

The dark side of antimatter

- 25 November 2010 by **Rachel Courtland**
- Magazine issue 2788.

Dark materials and lighter matters (Image: NASA/CXC/UMASS/D.Wang et al)

Two of the biggest mysteries in physics – what dark matter is made of and why matter dominates over antimatter – might be solved in one go

WHEN a detective finds that two seemingly separate crimes point back to the same suspect, solving each becomes easier. A similar boost could await cosmologists, who are asking whether two of the biggest mysteries in physics - what dark matter is made of and why there was an excess of matter over antimatter in the early universe - have a common origin.

The prospect of solving the two mysteries in one go is not new, but thanks to a batch of fresh models put forward in the last few months, the idea now seems "like it's not an exotic possibility", says Scott Watson of Syracuse University in New York, who helped organise a meeting at the University of Michigan in Ann Arbor last month dedicated to alternative dark matter theories. "It's actually something that we might expect."

Many of these new theories stem from a recent shift in our understanding of dark matter, the substance needed to create enough gravity to stop spinning galaxies from flying apart. The stuff is thought to make up about 85 per cent of the matter in our universe, making it five times more abundant than visible matter. That may seem a high proportion, but physicists want to know why it isn't even greater, and what dark matter actually is.

Countless candidates have been proposed, but weakly interacting massive particles, or WIMPs, hold a special place. These crop up in models like supersymmetry - a popular extension to the standard model of particle physics - yet can also explain the abundance of dark matter thought to exist today. This coincidence is dubbed the "WIMP miracle", and is one reason why WIMPs, until recently, have reigned supreme.

Now that view is changing. "A lot of the model building we've been doing has been based on the observation of a coincidence," says Matthew Buckley at the Fermi National Accelerator Laboratory in Batavia, Illinois. It's time to consider "whether we're being too restrictive; whether we have a one-track mind", he says.
Indeed, experiments designed to detect dark matter have recently hinted that the stuff may not fit the WIMP profile. The underground DAMA experiment in Gran Sasso, Italy, and the Coherent Germanium Neutrino Technology (CoGeNT) experiment in Minnesota have turned up evidence that the dark matter particle is lighter than the mass range favoured for WIMPs. What is more, excess gamma rays emanating from the Milky Way were attributed to lightweight dark matter last month.
At the same time, theorists are considering the possibility of alternative dark matter candidates, in case they pop up at the Large Hadron Collider (LHC) at CERN, near Geneva, Switzerland. It is within these more exotic dark matter possibilities that a theme is emerging: a range of particles and processes that could all also explain a second mystery.
Theorists are considering alternative dark matter candidates, in case they pop up at the LHC
In the minutes after the big bang, there were a billion-and-one particles of matter for every billion particles of antimatter. The two annihilated, leaving a slight excess of matter, from which all the matter we see today is descended. But the nature of the process that gave rise to slightly more matter than antimatter is unknown.
The new dark matter models (see "Particle X - the common ancestor?") offer explanations for this - as well as explaining the relative abundances of dark matter and visible matter, and what dark matter might be made of.
In some models, an asymmetry in the relative components of antimatter and matter within visible matter is transferred to dark matter or vice versa. In others, an imbalance between dark matter particles and antiparticles are created by the same processes and at the same time as visible matter and its antiparticles.
Compared with earlier attempts to link the antimatter and dark matter mysteries, these new theories "are a little closer to our ideas about particle physics now", says Watson. "The ideas are more developed." It's still early days, however. "A lot of these models will turn out to be wrong," cautions Buckley.
The hope is that they can help inform the hunt at the LHC. If WIMPs remain elusive, this new band of particles and processes may also help to shape the next generation of experiments.

Darkogenesis

Why did the universe end up with more matter than antimatter? Jessie Shelton of Yale University and Kathryn Zurek at the University of Michigan in Ann Arbor say the imbalance could have begun in dark matter particles, which then transmitted the imbalance to visible matter.
In their "darkogenesis" scenario, they suggest that when the hot, early universe cooled, it wasn't smooth but uneven and bubbly - at least in the "dark sector". This led to an imbalance between the number of dark matter particles and their antiparticles. Pretty quickly, "messenger fields" or other processes could have transmitted this asymmetry to the "visible sector" (arxiv.org/abs/1008.1997).

Xogenesis

Many models assume dark matter particles must be similar in mass to protons, the main building block of visible matter. Matthew Buckley of the Fermi National Accelerator Laboratory in Batavia, Illinois, and Lisa Randall of Harvard University say this doesn't have to be case.
In their class of models, called Xogenesis (for the monicker "X", which is often given to dark matter particles), the relative abundances of dark and visible matter, and the apparent preponderance of matter over antimatter, arose via dark particles that are much heavier than protons (arxiv.org/abs/1009.0270).
They assume dark matter was more abundant than dark antimatter in the early universe: this imbalance was then passed to ordinary matter.

Aidnogenesis

Unlike models in which an imbalance of matter and antimatter in the dark realm is transmitted to the visible realm or vice versa, in aidnogenesis - from the ancient Greek "aidno" for "dark" - the two asymmetries are created almost simultaneously.
The process began with an imbalance of leptons, a class of visible matter that includes electrons and their antiparticles. Mattias Blennow of the Max-Planck Institute for Physics in Munich, Germany, and colleagues, reckon this then spread to other visible matter and to dark matter. The dark matter particle that best fits this scenario would have a mass of roughly 6 GeV, which matches tentative signatures of dark matter from two detectors (arxiv.org/abs/1009.3159).

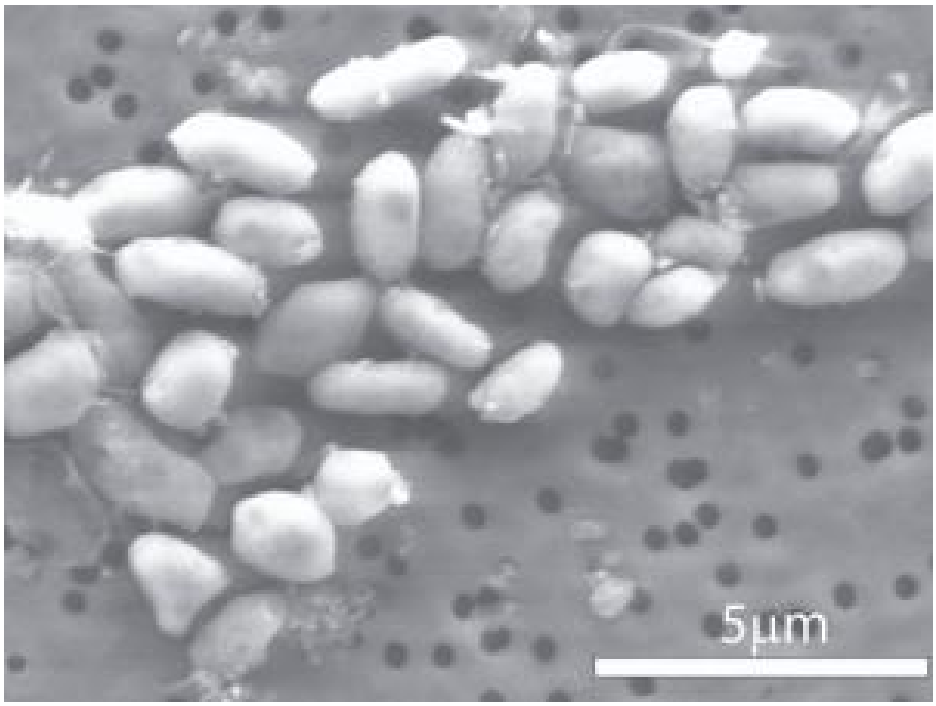
Particle X - The common ancestor?

Different species can have common ancestors. Perhaps different particles do, too.
Hooman Davoudiasl of the Brookhaven National Laboratory in Upton, New York, and colleagues suggest that ordinary matter and dark matter are descendants of the same, heavy "ancestral" particle, for now named "particle X" (*Physical Review Letters*, DOI: 10.1103/PhysRevLett.105.211304).
Particle X would have had a brief life in the early universe, they say, at which point it decayed into the building blocks of visible atoms and their antimatter counterparts, as well as a zoo of dark matter particles and their antimatter counterparts.
This process of "hylogenesis", named after the Greek word for primordial matter, may seem far-fetched because of its complexity, but it has the advantage of solving the apparent antimatter-matter imbalance. In hylogenesis, dark matter has a property such that the asymmetry between its matter and antimatter particles is able to balance the asymmetry that exists in the visible realm. What's more hylogenesis can also account for the relative abundances of dark matter and ordinary matter.
Unlike WIMPs, the leading dark matter candidates that come in only one variety, hylogenesis calls for two different breeds of dark matter, each with their own antiparticles. Both are too light to match up with the tentative signatures of dark matter seen in experiments today. Such signatures also suggest a particle lighter than a WIMP.
The two very light dark matter particles would be capable of colliding with and destroying protons. The telltale signature of these interactions could be seen in a re-analysis of data collected by the neutrino-hunting Super-Kamiokande experiment in Hida, Japan, which is already hunting for evidence of proton decay.

http://www.newscientist.com/article/mg20827883.400-the-dark-side-of-antimatter.html?full=true&print=true

Arsenic-based bacteria point to new life forms

- 18:04 02 December 2010 by **Olivier Dessibourg**



Parallel life (Image: Science/AAAS)

We could be witnessing the first signs of a "shadow biosphere" – a parallel form of life on Earth with a different biochemistry to all others. Bacteria that grow without phosphorous, one of the six chemical elements thought to be essential for life, have been isolated from California's Mono Lake. Instead of phosphorous, the bacteria substitute the deadly poison arsenic.

"Life as we know it could be much more flexible than we generally assume or can imagine," says Felisa Wolfe-Simon of NASA's Astrobiology Institute and the US Geological Survey in Menlo Park, California.

Wolfe-Simon's team took mud containing bacteria from the arsenic-rich Mono Lake and grew them in ever decreasing concentrations of phosphorous. Their rationale was that since arsenic is just below phosphorous in the periodic table, and shares many of its chemical properties and is even used as a source of energy for some bacteria, the bugs would be able to swap one for the other. That is just what happened.

"After one year, they are still alive and well," says Paul Davies of Arizona State University in Tempe. Not only that, the team showed that this ability was incorporated deep into the molecular building-blocks of the bacterium, strain GFAJ-1 of the salt-loving Halomonadaceae family, right down to the DNA.

Life's backbone

Until now, all known life has been built around the six major chemical elements carbon, hydrogen, nitrogen, oxygen, phosphorus and sulphur – known as CHNOPS – which make up proteins, lipids and DNA. In all normal life forms, phosphorus is a major part of the backbone of the genetic material.

"It's the first time such a chemical substitution has been shown for DNA," says Philippe Bertin of the University of Strasbourg, France, who was not part of the team. "Possibly, it's a relic of an ancestral metabolism that was supplanted during evolution because using phosphorus was more stable and less toxic."

Despite surviving on arsenic for a year, the bacteria would still "prefer" to grow using phosphorous: biomolecules react more efficiently in water and seem to be more stable when constructed with phosphorous than arsenic. They only substitute arsenic if there is no alternative.

Steven Benner, a chemist from the Foundation for Applied Molecular Evolution in Gainesville, Florida, who works on alternative forms of DNA, is sceptical that the bacteria really do contain arsenic. "I doubt these

results," he says, since in order to measure the modified DNA it has to be put into a water-containing gel, which would rapidly dissolve any arsenate molecules. Any hypothesis that arsenate might replace phosphate in biomolecules must take this into account, he says.

Shadow biosphere

Davies says that future work will address the stability-in-water issue, but argues that the discovery underlines the need to look further for the first true representatives of alternate life forms in Earth's shadow biosphere. Where to search? Extreme and isolated ecological niches such as dry deserts or cold plateaus, boreholes in the mantle or deeper, contaminated lakes or deep-sea hydrothermal vents would be a good target. "It could also be that this 'weird life' is all around us, intermingled with carbon-based life. If so, it's going to be hard to detect, as we would have to find a way to first filter everything out," says Davies.

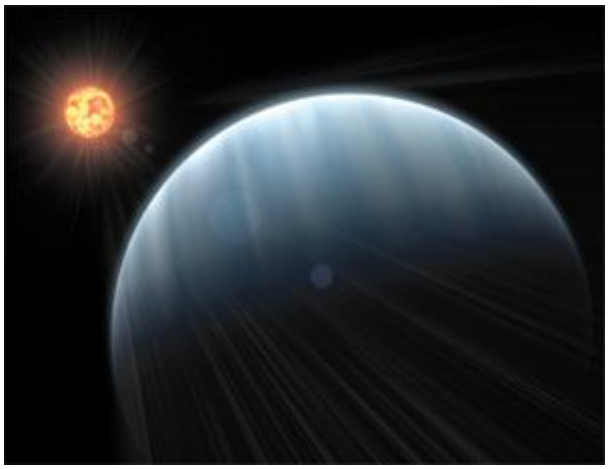
Arsenic-bacteria have implications for possible extra-terrestrial life, too. "If life started in more than one manner on our planet, it would be very peculiar to believe that other places in the universe are not teeming with it," says Davies. He says we should think carefully about which chemical elements to follow to find it.

Journal reference: *Science*, DOI: 10.1126/Science.1197258

http://www.newscientist.com/article/dn19805-arsenicbased-bacteria-point-to-new-life-forms.html

Super-Earth's atmosphere analysed for first time

- 21:43 01 December 2010 by **Alan MacRobert, SkyandTelescope.com**



Astronomers have probed the atmosphere of a super-Earth for the first time (Image: Paul A Kempton)

A crude spectrum has been obtained for the atmosphere of a super-Earth orbiting a dim red dwarf star 40 light years away. The planet's upper atmosphere is apparently dominated by steam or cloudy haze.

The star, Gliese 1214 (GJ 1214) in Ophiuchus, is 300 times dimmer than the sun. Its planet was discovered in 2009 when the MEarth Project detected the planet's silhouette periodically dimming the star. The planet has 6.5 Earth masses, as determined later by the star's gravitational wobbles, and it circles the little star very closely in just 38 hours. The transits reveal the planet's diameter to be 2.6 times Earth's – making its average density very low, only about a third of Earth's density.

Using one of the European Southern Observatory's 8.2-metre Very Large Telescope reflectors, a team of astronomers detected a telltale absorption spectrum caused by a tiny fraction of the star's light filtering through the planet's atmosphere during each transit. The spectrum was featureless, indicating that the upper atmosphere either consists mostly of water vapor or is dominated by high-altitude clouds or haze.

"This is the first super-Earth to have its atmosphere analysed. We've reached a real milestone on the road toward characterising these worlds," said team leader Jacob Bean of the Harvard–Smithsonian Center for Astrophysics in a statement.

Before this observation, astronomers had suggested three possible atmospheres for Gliese 1214b. The planet could be shrouded by water – which, given its high temperature so close to the star (200 ºC), would be in the form of steam. Or it could be a rocky world with an atmosphere of mostly hydrogen obscured by high clouds or hazes. Or it might be a mini-Neptune, with a small rocky core and a deep hydrogen-rich atmosphere, the upper part of which would be clear.

The measurements clearly show no sign of hydrogen and thus rule out the third option. So the atmosphere is either rich in steam or blanketed by clouds or hazes. The planet's low density, meanwhile, indicates that it's a waterworld.

"Although we can't yet say exactly what that atmosphere is made of, it is an exciting step forward to be able to narrow down the options for such a distant world to either steamy or hazy," says Bean. "Followup observations in longer-wavelength infrared light are needed to determine which of these atmospheres exists on Gliese 1214b."

Journal reference: *Nature* (DOI: 10.1038/nature09596)

http://www.newscientist.com/article/dn19799-superearths-atmosphere-analysed-for-first-time.html?full=true&print=true

Space debris may cause mysterious ball lightning

- 00:01 01 December 2010 by **Wendy Zukerman**

Space debris falling into the atmosphere may cause mysterious ball lightning.
Thousands of people have seen floating orbs of light, sometimes during thunderstorms, but their origin has never been established.
Earlier this year, scientists proposed that ball lightning was merely a hallucination caused by magnetic fluctuations during storms.
However, the weather was clear when Don Vernon, a farmer in Queensland, Australia, spotted two green balls descending from the sky on 16 May 2006. Oddly, the second rolled down a hill, bounced over a rock and then vanished.
Stephen Hughes, an astrophysicist at the Queensland University of Technology in Brisbane, set up an online survey to find out more. More than 100 people, scattered over a 600-kilometre-long strip along Australia's east coast, reported seeing a bright fireball like the first green ball that Vernon saw, but no else saw the bouncing ball.
The observations suggest that the first orb was probably a bright meteor caused by debris from Comet 73P, which came closer to Earth at that time than any other comet in 20 years. The second, Hughes says, was ball lightning triggered by the meteor.

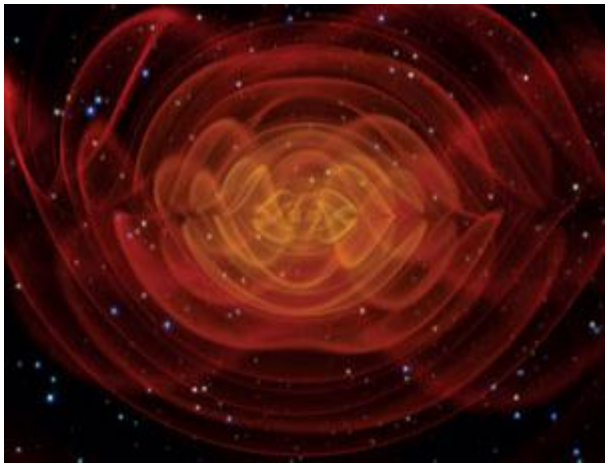
Extra current

The cometary debris ionised the atmospheric gas it passed through, boosting the current that normally flows between the ionosphere – an electrically charged region in the upper atmosphere – and the ground, Hughes believes.
When this "supercharged" conduit hit the soil, it formed a plasma ball, he argues. He says impacting space junk might also produce the effect.
"It is certainly plausible," says John Lattanzio, an astrophysist at Monash University in Victoria, Australia. But he adds: "It's almost impossible to prove anything with such an ephemeral event as this."
John Lowke, a ball lighting researcher at Australia's national science agency in Sydney, says space debris probably does not explain all observed ball lighting.
During a storm, when most observations have been reported, Lowke says, "it's far more likely that the electrical current is coming from a thundercloud 5 kilometres above the ground, rather than a direct line to the ionosphere 100 kilometres away."
Journal reference: *Proceedings of the Royal Society A* (DOI: 10.1098/rspa.2010.0409)

http://www.newscientist.com/article/dn19789-space-debris-may-cause-mysterious-ball-lightning.html?full=true&print=true

Gravitational waves: Inside the Equinox Event

- 29 November 2010 by **Harry Collins**
- Magazine issue 2788.



If Einstein is right, the collision of two massive objects causes ripples in space-time (IMage: Chris Henze/NASA)

A potential breakthrough in one of the longest-running projects in physics showed how science really *works, says sociologist* ***Harry Collins***

THE two huge interferometers belonging to one of the world's biggest physics experiments, the Laser Interferometer Gravitational-Wave Observatory (LIGO), experience a simultaneous burst of energy. The interferometers are separated by around 3000 kilometres, one in Louisiana and one in Washington state, and such interesting coincident pulses are just what the scientists are looking for...

That was in September 2007. Chance aside, a coincidence across that distance had to be caused by something interesting, so it began to look as if this was the nearest thing to a believable gravitational wave anyone had seen in 50 years of searching.

The next 18 months were exciting. Behind closed doors the scientists worked and argued over the "Equinox Event". Was it a signal? Could it, after all, have been a chance coincidence caused by noise? Then again, was it a "blind injection" - a fake signal introduced by members of the team sworn to secrecy? The idea being to keep the scientists on their toes and to remind them not to be so sceptical they lose the ability to see anything after 50 years of collective suspicion about every last blip.

Behind closed doors the scientists worked and argued over the Event

In the early 1970s, my sociology PhD had taken me to the US on a road trip. Among the four areas I set out to explore, one I learned about through a *New Scientist* article. I have now spent nearly 40 years investigating gravitational wave detection, and have recently been admitted to the meetings and email discussions that are normally the preserve of insiders alone. I have been recording the debates and photographing key moments. It's a unique position for a sociologist, professionally and personally, and some of the scientists are now my friends. The full story of the investigation of the Equinox Event and its tense and dramatic conclusion are set out in my book *Gravity's Ghost*.

Einstein's theory of relativity predicts that movements of massive objects, so long as they are not exactly symmetrical, will generate disturbances in space-time. These spread out like waves. Strong waves might be generated by the final moments of a binary star system as the two bodies spiral into each other, for example, or by the explosion of stars.

The 1993 physics Nobel prize was awarded to Russell Hulse and Joseph Taylor, both of Princeton University, for their work on the decaying orbit of a binary star system on the journey that would eventually lead to its collapse. They concluded that the decay was consistent with the emission of gravitational waves. But the ultimate goal is to detect the waves directly. When that is achieved we will have a new form of astronomy that can see into the heart of quaking black holes.

The trouble is that the strength of gravitational waves decreases with distance from the source. That means that by the time even the strongest waves get to Earth, they will be very weak, so the hunters need very sensitive detectors. The LIGO detectors are state of the art, but even these massive machines have little chance of seeing the effect.

To claim a detection, the American interferometers need to establish with high statistical significance that there have been coincidental changes of 1000th of the diameter of a proton in the 4-kilometre length of the interferometers' arms. The search for gravitational waves involves extracting vestigial signals from the noise and working out that they were very unlikely to have been due to chance. This requires enormous care and painstaking protocols to avoid any possible bias.

As the story of the unravelling of the Equinox Event shows, many of the standards set in advance could not be met. For example, one rule is to "freeze" the statistical protocol before analysing the data and then never change anything in case this is seen as biasing the statistics. But this rule has some crazy implications, such as not being able to cross-check a result with other kinds of astronomers the moment something that could be important is seen: as soon as you know you might have seen something, the subsequent analysis cannot be so neutral.

Moreover, statistical analysis in this, as in all sciences, depends on all kinds of unknowns and imponderables: how many interpretations of the statistics have been made by others? Was a particular outcome imagined before or after the event? And if weak results and their attendant hypotheses are not published (something the scientists tend to hate doing), how can we be sure that hypotheses are not being continually altered to fit the facts - "drawing the bulls-eye after the arrow has hit the target", as one of the scientists put it. Statistical tests are like used cars: they may look shiny, but you need to know the number of previous owners and how the cars have been driven. In statistics as with cars, it is usually impossible to know for sure.

Nearly every decision made in the course of working out the Equinox Event turned out to have been affected by the field's history. The years of failed claims had been experienced as intensely embarrassing by the scientists - and used as ammunition by their critics. The net effect was an endemic cautiousness: this has pushed young scientists to bide their time and they are waiting for the generation of more powerful detectors, now being built, to come online. Some of the older scientists, with less working time ahead of them, are less patient.

In spite of all these problems, the unfolding of the Equinox Event represents science at its best, albeit a fallible best. The trouble is that scientific endeavour, especially in exact sciences like physics, is still masked by a mythology of perfection, something the scientists involved find hard to give up.

That is why so little is known about the Event: the scientists would say nothing in public even about such an interesting stretch of data unless they were certain they had found a gravitational wave. Obviously, the Equinox Event never reached the standard for announcement as a discovery or you would already know about it. Nevertheless, since the dust has settled, I have been freed to give the story the richer telling it deserves, to try to recapture the excitement of those months, and to try to draw out the lessons that can be learned from it.

I found researchers laudably aspiring to a standard of perfection that just could not be attained. But the integrity of the enterprise can still provide lessons on how to go about making technological decisions in conditions of uncertainty. It shows that something better than cynical realpolitik can and should always be our goal.

And if the rest of us are to be able to draw these lessons we need to be allowed to see what really happens in science. We need more than the polished, hygienic accounts that appear in the final discovery papers. We need to learn from the struggle to make decisions in a good way as the intense and imponderable pressures of the moment bear upon them.

Profile

Harry Collins is at the school of social sciences at Cardiff University, UK. This essay is based on his book *Gravity's Ghost: Scientific discovery in the twenty-first century*, University of Chicago Press. For more about the project, go to http://bit.ly/acgmWZ

http://www.newscientist.com/article/mg20827881.300-gravitational-waves-inside-the-equinox-event.html?full=true&print=true

Experiment casts doubt on origins of lunar water

- 13:56 25 November 2010 by **Dana Mackenzie**

Lunar liquid mystery deepens (Image: NASA)

The mystery of how the moon got its surface water has just got deeper, following the failure of an attempt to replicate the mechanism that was thought to produce it.

Three separate space missions last year reported detecting a sheen of water only molecules thick over large parts of the moon's surface. Many planetary scientists assumed the water was created when particles from the solar wind hit lunar soils, but this idea has now been thrown into doubt.

"The solar wind cannot produce water in sufficient quantities to account for the results of the three missions that observed it," says Raúl Baragiola, a member of the team at University of Virginia, Charlottesville, that tried to reproduce this effect in the lab.

For years, theorists have believed that protons from the solar wind could produce water on the moon by prying oxygen atoms away from minerals in the lunar soil and combining with them to form hydroxyl radicals (OH) or water (H_2O). This hypothesis gained credibility recently with the observations of hydroxyl and water by NASA Deep Impact and Cassini missions, and the Indian probe Chandrayaan-1.

Bone dry

Baragiola and colleagues tested the idea by blasting protons at crystals of ilmenite and anorthite, two of the most common lunar minerals, in a high vacuum. They found no sign that water or hydroxyl radicals were produced. In fact, they found the opposite: the protons destroyed any traces of water that had remained in the minerals after 24 hours of baking prior to the experiment.

Carle Pieters of Brown University in Providence, Rhode Island, who was lead author of last year's report from Chandrayaan-1, admits to being puzzled by the results.

But Jeffrey Gillis-Davis, a planetary geologist at the University of Hawaii, thinks the established hypothesis might yet be correct. "This does not put the final nail in the coffin" of the solar wind hypothesis, he says. True lunar soil could behave differently from the crystals tested, as it consists of about 60 per cent agglutinated glass.

Gillis-Davis says texture is important in promoting chemical reactions that might produce water in lunar soil. "Space weathering" processes like this are more likely to occur in powdery soils than in crystals, he says.

Baragiola is planning to repeat his experiments with real lunar soil.

Journal reference: *Icarus*, DOI: 10.1016/j.icarus.2010.11.007

http://www.newscientist.com/article/dn19768-experiment-casts-doubt-on-origins-of-lunar-water.html

Hardy bugs could survive a million years on Mars

- 19:48 23 November 2010 by **Hazel Muir**

Would you want to live here for a million years? (Image: NASA)

It was already nicknamed "Conan the Bacterium" for its ability to withstand radiation. Now it seems *Deinococcus radiodurans* could, in theory, survive dormant on Mars for over a million years.

Lewis Dartnell at University College London and colleagues froze the bugs to -79 °C, the average temperature at Mars's mid-latitudes. Then they zapped them with gamma rays to simulate the dose they would receive under 30 centimetres of Martian soil over long periods of time.

The team worked out that it could take 1.2 million years under these conditions to shrink a population of the bacteria to a millionth of its original size.

Earlier studies suggested that the bacterium can endure four times as much radiation in the Martian cold as at room temperature. If a cell is frozen, radiation does less damage to it because the free radicals it creates are much less mobile. "Cold is good in that respect," Dartnell says. "It improves the chances of cells surviving radiation."

Antarctic bugs

Dartnell's team also isolated three new strains of bacteria from the Dry Valleys of Antarctica, where winter temperatures drop to -40 ºC.

The hardiest of the bugs, a new strain of *Brevundimonas*, could persist for 117,000 years on Mars before its population would be reduced by a factor of a million, the team's work suggests.
"The more we learn about Earth life, the more likely it appears that it could survive in other parts of the solar system," says Cassie Conley of NASA in Washington DC.

High vacuum

But even if terrestrial microbes could survive on Mars itself, they might not fare so well on the journey there, she cautions. To simulate spaceflight, she suggests that the experiments be repeated in a high vacuum, which can desiccate microbes. "In space, you suck off nearly all the water molecules," Conley says. This removal of water could make it more difficult for cells to repair radiation damage.

Conley, who makes sure NASA missions minimise the risk of contaminating other worlds with microbes, says the agency's policy on planetary protection already takes into account that some microbes are amazingly radiation resistant.

"The policy is that we won't contaminate other planets or moons, because just one colonising event could screw up our ability to study indigenous life forever," she told *New Scientist*.

Journal reference: *Astrobiology* (DOI: 10.1089/ast.2009.0439)

http://www.newscientist.com/article/dn19763-hardy-bugs-could-survive-a-million-years-on-mars.html?full=true&print=true

Robots learn to read the writing on the wall

- 29 November 2010 by **Colin Barras**
- Magazine issue 2788.

Coke or water? (Image: SM/AIUE/Getty)

A new breed of robot is using text-spotting software, dictionaries and internet access to learn to read anything, anywhere

INGMAR POSNER wants to develop robots that can see through walls. Not by equipping them with X-ray specs or specialised radar technology, but simply by teaching them to read.

"By reading a label on a closed door you can sometimes get a good idea of what can be found behind it," says Posner, a roboticist at the University of Oxford. "Reading can help you detect things you cannot directly see."

Roboticists have spent years teaching their robots a range of skills to help them get by in the real world. Robots have learned to map their surroundings and to pick up and manipulate cumbersome objects. Some have even shown signs of becoming self-aware. But, remarkably, they remain illiterate.

With the written word so prevalent in the human world - from road signs to shop names - a non-reading robot trying to prove its worth is placed at a severe disadvantage, says Paul Newman, who works alongside Posner. Along with Peter Corke at the Queensland University of Technology in Brisbane, Australia, the team are trying to help robots level the playing field.

Teaching robots to read should, in principle, be relatively simple. After all, optical character recognition (OCR) software packages already exist. These automatically turn scanned images of books into text, and many researchers are using them to turn robots' attention towards posters and signs on city streets. Last year, for example, Google launched Goggles, a smartphone application for just that task. Since May, Goggles has been able to translate languages, helping tourists work out what to order from a menu, for instance.

Current 'reading' software tries to force everything a robot sees into text, such as walls and chimneys

Good OCR software is only a partial solution, however. Goggles relies on the user to recognise text and point a phone's camera at the words before the OCR software kicks in. Robots will not have the luxury of human help, and researchers have found that OCR software cannot pick out words embedded in a busy scene by itself.

"The OCR software doesn't cater for the fact that it might not be seeing text," says Posner. "It tries its level best to force everything into text - brick walls, chimney stacks, everything." The result is a nonsensical muddle.

To get round this problem, the team developed text-spotting software. This relies on the fact that there is often a horizontal area of uniform colour just above and below text on a sign, but lots of two-tone colour variation within the text itself. Once the software has identified text, an image of it is passed onto the OCR software to read.

Even then, the results returned by the OCR software are often error-strewn. So the team has loaded their test robot, Marge, with a dictionary and spellchecker. This allows it to work out that "roodbond" is most likely a misreading of "broadband", while "nqkio" should be read as "nokia".
To understand names it reads in its environment, Marge turns to news websites, such as *The New York Times* and BBC Online. The robot trawls the sites for appearances of the word it has read, and analyses how often keywords like "restaurant" or "bank" appear in the same stories. This allows it to make strong semantic connections between frequent matches. Using this approach, Marge has learned that Strada is a UK restaurant chain, and that Barclays is a UK bank.
With those systems in place, Marge is now ready to read and exploit text in the world in the same way a human does - a "seriously exciting" prospect, says Posner. The work was presented at the International Conference on Intelligent Robots and Systems in Taipei, Taiwan, last month.
One potential problem is identifying words that are difficult to read because of the viewing perspective, says Majid Mirmehdi at the University of Bristol, UK, whose team has developed its own software to help robots to read. Words printed on a curved surface can appear distorted, making them tricky for a robot to understand. Mirmehdi's team is working on improving their software to overcome this, so a humanoid robot with dextrous hands can manipulate objects - like cylindrical paint cans - to read them more easily.
Posner hopes his team's work will allow mobile robots to carry out tasks more easily by following signs the same way a human can. For example, a search-and-rescue robot in a building wouldn't need to gradually build its own map of the building - it could read any available signs to find its way around.
While such end results are still a long way off, other roboticists agree that reading projects are worth pursuing. The work is "refreshingly original in the robotics context", says Gregory Dudek at McGill University in Montreal, Canada. "I personally believe that exploiting OCR methods in a mobile robotics context makes a lot of sense," he adds. "In fact, once you reflect on it, there is no doubt it will be highly useful."

http://www.newscientist.com/article/mg20827885.100-robots-learn-to-read-the-writing-on-the-wall.html

Anti-tracking initiative gets US government support

- 22:04 01 December 2010 by **Jim Giles**

A simple but powerful way to protect users' privacy on the web is attracting growing support from companies and privacy advocates.

The system, known as Do Not Track, received a vote of confidence today from the Federal Trade Commission (FTC), the US government agency responsible for protecting consumers. The commission said that it wants companies that track our movements across the web, such as advertising firms, to use Do Not Track to give consumers an easy way to opt out of such monitoring.

"Online advertisers are tracking people with an astonishing array of methods," says Peter Eckersley of the Electronic Frontier Foundation, a non-profit group based in San Francisco. "The Do Not Track proposal is a response to this predicament."

Heading off advertisers

The FTC gave few details of its preferred anti-tracking mechanism, but what it did say fits with a system developed by computer scientists at Stanford University. The Stanford team wants Apple, Microsoft and other browser developers to incorporate a special "header" option into their software. Headers are snippets of information that browsers send to websites. The Do Not Track header, if activated, would be a message instructing the website not to record the user's visit.

Proposals of this type already have the support of privacy advocates and some companies that engage in tracking. Legislators in the House of Representatives Subcommitee on Commerce, Trade and Consumer Protection are also considering taking action. They will discuss possible anti-tracking legislation tomorrow and could provide solid support for such a bill. "This is the most bipartisan of issues," says Jon Leibowitz, FTC chairman.

Pushing Back

Advertisers are expected to push back, however. The industry uses tracking technology to learn about internet users' interests and to target ads accordingly. Someone who visited the Ford website might, for example, be seen as interested in purchasing a new car and then be shown adverts from car manufacturers.

A coalition of advertising companies recently created a website -- www.aboutads.info -- that allows consumers to opt out of tracking technologies. The site has been criticised for not covering all the sites that track consumers and for relying on an anti-tracking mechanism that is less reliable than the header-based system. Recent reports in the Wall Street Journal have also alleged that advertising executives have pressured browser developers into limiting anti-tracking systems.

Even if it Congress decides to legislate on Do Not Track, the success of the initiative is not certain, since consumers would would have no way of knowing whether a website had honoured their no-tracking request. Leibowitz says that he wants to get feedback on the proposals before considering how best to enforce the system: "We're not at the point where we can figure out how to punish violators."

http://www.newscientist.com/article/dn19801-antitracking-initiative-gets-us-government-support.html?full=true&print=true

Lighting up chips gives computers a brain boost

- 21:34 01 December 2010 by **Duncan Graham-Rowe**

A look at IBM's new chip architecture. (Image: IBM)

Computers could soon be rivalling the human brain for speed of thought.
The computer giant IBM today unveiled a new type of computer chip that integrates both electrical and optical nano-devices on the same piece of silicon. This could soon make it possible for supercomputers to perform one million trillion calculations – or an exaflop – in a single second. Such supercomputers would not only be a thousand times faster than today's most powerful petaflop machines, but for the first time would have the same processing power as the human brain, says William Green, a researcher at IBM's silicon integrated nanophotonics group at Yorktown Heights, in New York.
One of the main challenges in making super-fast computers lies in the ability to quickly transmit large amounts of data between chips, he says. But while optical fibres are much better at doing this than copper wires, components that convert electrical data into photons tend to only exist in separate off-chip devices. This means that data still has to flow through wires to reach them, which creates a bottleneck.

Light speed

But over the last four years IBM has developed a range of tiny photonic switches, waveguides, detectors and modulators, all of which are made out of silicon. And now for the first time these have been integrated into chips, so that the same silicon that makes up the electrical circuitry and transistors of the chip is also used to convey and convert photons, and channel them off the chip through thousands of waveguides, each just 500 nanometres wide.
Announcing the technology - called CMOS Integrated Silicon Nanophotonics - at the SEMICON conference in Tokyo, IBM says that a single chip can transmit terabits per second of data from a single processing core. And since these photonic devices are made out of silicon they can be made using the same fabrication processes used to make the transistors.
Switching to silicon nanophotonics could greatly improve the speed and power consumption of computer chips, says Hiroshi Mizuta, head of the University of Southampton's Nano Research Group in the UK. "(Computing) performance is heavily limited by the interconnections," he says.

Shrinking chips

The nanotechnology will also allow the optical and electrical components to be integrated into an area occupying ten times less silicon than conventional components, says Green.
IBM hopes to use the technology to create powerful exaflop supercomputers within the next five years. But further into the future the technology could also find its way into high performance games consoles, to increase the flow of data between graphics cards and processors, he says.

http://www.newscientist.com/article/dn19800-lighting-up-chips-gives-computers-a-brain-boost.html?full=true&print=true

Sun and sand breed Sahara solar power

- 15:03 30 November 2010 by **Michael Fitzpatrick**

The raw materials are all around (Image: Bernhard Lang/Getty)

Life might take a hammering on the sun's earthly anvil, the Sahara desert, but the two most abundant resources the desert has to offer – sunlight and sand – could help solar power to "breed" and thrive there.
The Sahara Solar Breeder Project is a joint initiative by universities in Japan and Algeria that aims to build enough solar power stations by 2050 to supply 50 per cent of the energy used by humanity.
The idea is to begin by building a small number of silicon manufacturing plants in the Sahara, each turning the desert sand into the high-quality silicon needed to build solar panels. Once those panels are operating, some of the energy they generate will be used to build more silicon plants, each churning out more solar panels and generating more energy that can be used to build even more plants, and so on.
Hideomi Koinuma at the University of Tokyo leads the Japanese end of the project. He admits that making silicon panels from the rough sands of the Sahara or other deserts has not been attempted before, but says it is a logical choice.
"From the viewpoints of quality, quantity and chemistry, Sahara sand is hard to beat for use as silicon for solar cells," he says.

Rivals for power

The Algerian-Japanese effort is by no means alone in targeting the Sahara for solar power. The Desertec Foundation, set up last year to promote "clean power from deserts", also aims to generate solar power in the region.

Desertec has a more modest goal – it is dedicated to supplying only 15 per cent of Europe's electricity by 2050. Nor does Desertec plan to use Sahara sand for its solar panels.
Desertec hails the new breeder project as "a positive contribution towards climate protection". However, a spokesman said he was puzzled over the choice of energy delivery by the new scheme.
Koinuma wants to use "high-temperature" superconductors to distribute the power as direct current – more efficient than a conventional alternating current. Despite their name, high-temperature superconductors typically operate at around -240 °C, and the long power lines will require a formidable cooling system.
"There is not really a need for superconductors. By using high-voltage direct current transmission lines it is possible to transport clean power from the deserts over long distances to centres of consumption," says the Desertec spokesman – adding that the technology is already used in dozens of projects worldwide.
"Transmission losses are fairly low – around 3 per cent per 1000 kilometres. Unlike superconductors, there is no need for cooling, while power transmission costs are just 1¢ to 2¢ per kilowatt-hour."
Koinuma disagrees. He sees the potential for linking the Sahara-powered stations to a special network of supercooled high-voltage DC grids for transporting electricity 500 kilometres or more.
"Even if we need to cool the grid line with liquid nitrogen, the system could be cost-competitive," he claims.

http://www.newscientist.com/article/dn19785-sun-and-sand-breed-sahara-solar-power.html?full=true&print=true

Bugs and sparks turn salty water fresh

- 15:35 29 November 2010 by **Helen Knight**

Mixing bacteria with drinking water sounds like a recipe for an upset stomach. But a bug-powered desalination cell that takes salt out of seawater may cut the cost of quenching the world's thirst.
With one-third of the planet's population lacking sufficient drinking water, governments are increasingly looking to desalination to produce fresh water from seas and estuaries.
However, conventional desalination plants consume large amounts of energy. For instance, they use reverse osmosis, in which water is forced at enormous pressure through membranes that screen out salt. This means there's keen interest in less energy-intensive approaches.
One that's recently been explored uses bacteria that generate electrical power by eating organic matter. If these bacteria feast on domestic sewage in an "anode" chamber, they generate electrons that can pass into a circuit while releasing protons. To balance the now positively charged sewage solution, negative chloride ions squeeze through a membrane from an adjacent chamber containing salty water that is to be desalinated. Meanwhile the electrons are delivered to a third, "cathode" chamber on the opposite side of the desalination chamber. The cathode chamber is also filled with a saltwater solution. Here, the electrons react with hydrogen ions in the solution and oxygen from the air to form water. To balance the negative charge caused by the loss of positive hydrogen ions, sodium ions pass from the central saltwater chamber into the cathode chamber via another membrane. With time, the salty water in the central chamber becomes fresher.

Tang trouble

But such a device is relatively inefficient, says Bruce Logan at Pennsylvania State University in University Park: as the organic content in the waste water falls, the voltage produced by the bacteria drops and pulls fewer ions out of the saline water, leaving it with a salty tang. Flushing the anode with more sewage is one option, but Logan's team are keen to squeeze as much use from each batch of dirty water as possible.
They have has developed a simple solution: boost the voltage from the bacteria with an external power source to make up any deficit. Furthermore, if the electrons react only with water at the cathode, they generate hydrogen gas – which contains enough energy to fuel the extra voltage requirements.
The team filled the central chamber of their cell with brackish water containing 5 grams of sodium chloride per litre, as might be found in an estuary, and applied a voltage of 0.55 volts to the setup. Over several hours, the salinity of the salt water dropped by 68 per cent to 1.6 grams of salt per litre. A standard microbial desalination cell stalls when the salinity reaches 40 to 60 per cent – or 2 to 3 grams of salt per litre.
By varying the voltage added to the system as the reaction continues – and by using more water in the anode and cathode chambers than in the saltwater chamber – Logan says it should be possible to reduce the salinity to the 0.8 grams of salt per litre typical of drinking water.
"It is likely people would still want some sort of added treatment to ensure good quality water, and thus we expect a downstream reverse osmosis unit to still be used," he says, but using the new cell as a "pre-treatment to greatly reduce salt concentrations" should help to substantially reduce the energy needed to obtain fresh water from the sea.
Journal reference: *Environmental Science and Technology*, DOI: 10.1021/es1025646

http://www.newscientist.com/article/dn19779-green-machine-bugs-and-sparks-turn-salty-water-fresh.html?full=true&print=true

Engines of the future: Search-friendly spam

- 28 November 2010 by **Ben Daviss**
- Magazine issue 2787. **Subscribe and save**

Getting top is big business (Image: Oleksiy Maksymenko/Superstock)

Companies seeking to boost their sites' rankings are trying to subvert search engines' algorithms on an industrial scale

"Search engines are the sunlight of the web, showing us what is visible," says Kevin Chang, a computer scientist at the University of Illinois at Urbana-Champaign. But by their nature, he adds, the beams that guide us also cast deep shadows.

Chang is referring to the huge power that search engines wield. With online commerce worth $34 billion a year in the US alone, any bias for or against a company in search results can have a huge effect on its bottom line.

Some studies suggest that search engines reinforce inequalities in the online world by giving websites that are already popular a high ranking in results, thus making them even more popular - an effect dubbed "Googlearchy". Other studies contradict this, indicating that web searches can boost low-key sites too.

Whatever the truth, with so much potential business at stake it is hardly surprising that website owners tweak their sites to try to ensure they float to the top of the rankings. Some even resort to tricks such as spamdexing - overstuffing web pages with keywords, say, or creating "link farms" of pages that repeatedly link to each other.

Now companies such as US-based Demand Media are trying to subvert search engines' algorithms on an industrial scale - in Demand Media's case, by mining the most popular keywords and links daily, then inserting them into thousands of brief, ad-laced "how-to" videos and articles it has churned out to capitalise on these trends. Demand Media's goal is to flood the web with a million of these high-profile pages every month and profit from the advertising revenue that they generate. It is not the only company adopting this strategy. In December 2009 internet giant AOL announced it would be following suit. And in May this year Yahoo bought Associated Content, another company producing "search optimised" content.

So are search engines unwittingly creating a web mired knee-deep in junk content? Not necessarily, says Sue Feldman of consultants IDC, based in Boston: "When you present people with a search result that's intended more to sell them something than tell them something, they don't react positively." According to internet analysts Hitwise, surfers are becoming more sophisticated too, adding extra words in each search query for better results. Besides, developments such as semantic search and the ability of search engines to tailor results to your search history and location will help us avoid this cyberlitter, says Stephen E. Arnold, author of *The Google Trilogy*. "The search experience will be more fluid and more intelligent," he predicts.

http://www.newscientist.com/article/mg20827872.200-engines-of-the-future-searchfriendly-spam.html

Engines of the future: The cyber crystal ball

- 27 November 2010 by **Phil McKenna**
- Magazine issue 2787

Patterns of web use may help predict flu spread (Image: Jaafar/AFP/Getty)

The future is being prepared now, so we may be able to tell where it's headed if we can learn to read the web right

Web search holds the key to the future. So say the Time Monks, as the group that runs the Web Bot project styles itself. This uses web crawler software to find 300,000 keywords in blogs, forums and chat rooms, then applies a filtering algorithm to the text around each keyword, combining the results to predict future events. So far the results of this "wisdom of crowds" approach have been mixed. Yet in May Google saw fit to invest in Recorded Future, a Boston-based start-up that specialises in novel ways to relate the past, present and future. Its software collates web-based information about people, places and events, as well as the tone of news reports and posts from tweets, blogs and social media sites. Specialised algorithms then label the information, look for connections and attempt to plot the "online momentum" for each event. According to Recorded Future, this can help predict events such as stock market trends, the launch of new pharmaceuticals, even terrorist attacks. Yahoo's research lab in Barcelona, Spain, has developed a similar system called Time Explorer.

Yet search queries themselves could prove more valuable. With access to billions of these queries, search engine analysts have an unparalleled insight into the collective mind of the online community. In the last five years they have found evidence that figures for unemployment benefit claims in the US, Germany and Israel, book rankings on Amazon, US car sales and the incidence of certain cancers are all mirrored by changes in the volume of web searches for associated terms. Studies by Google and by the University of Iowa with data from Yahoo have concluded that the volume of flu-related search terms mirrors the number of new flu cases in the US. By exploiting this search query data, Google's Flu Trends service has proved able to pick up changes in the incidence of flu a week or so before they are reported officially.

It may not be predicting the distant future, but it is certainly helping us pin down the present, says Nello Cristianini, a computer scientist from the University of Bristol, UK. This "nowcasting" can be extremely

useful, he says. For example, government agencies can use it to infer the state of society or the economy in near real-time, and the information is cheap and relatively easy to gather.
Cristianini believes this kind of data may be able to help predict an impending event such as a humanitarian crisis, and hopes to improve the technique's reliability. He is testing an automated search that hunts for flu-related words in Twitter posts in the UK. His initial results suggest that interrogating Twitter can provide a useful complement to analysing search statistics.
Web search trends could also prove useful to business analysts, according to a recent study by Yahoo Research Labs in New York. It examined whether search data could predict box office takings at cinemas, video game sales and the chart positions of songs weeks or months in advance. The results suggest that in a few cases, search data is better than conventional indicators and so could be important in financial analysis, where even small improvements in the accuracy of predictions offer significant rewards. Search queries could also be useful for predicting sudden changes in consumer behaviour, which existing models find hard to anticipate.

http://www.newscientist.com/article/mg20827872.100-engines-of-the-future-the-cyber-crystal-ball.html?full=true&print=true

Microsoft develops shape-shifting touchscreen

- Updated 13:16 29 November 2010 by **Paul Marks**

Touchscreens get textured (Image: Fuse/Getty)

Microsoft this week filed a patent application covering a novel way to construct a "tactile" touchscreen – a display that uses technical tricks to convince users they are actually touching the ridges, bumps and textures of a displayed image.

Whereas previous screens produced only an illusion of texture, Microsoft proposes producing a real texture, using pixel-sized shape-memory plastic cells that can be ordered to protrude from the surface on command.

It's a new approach to the challenge, but not the first. Communications giant Nokia, Disney Research in Pittsburgh, Pennsylvania, and a Finnish firm called Senseg are all developing displays that use voltages of different frequencies, applied to a grid below the touchscreen, to trick our fingertips into experiencing a wide variety of touch sensations. They are known as vibrotactile displays.

They work well, but have limitations. For one thing, they can be noisy: some of the frequencies are in the audio range, so a buzz can be heard. Such problems may have prompted Microsoft to pursue a radically different approach.

UV switch

In US patent application 2010/0295820, published yesterday, Microsoft proposes using a layer of shape-memory plastic placed above a large touchscreen to distort the surface of the screen when different wavelengths of ultraviolet light strike the pixels from beneath.

Microsoft's named inventor, Erez Kikin-Gil at the firm's Redmond campus in Washington state, says in the patent that the idea is aimed at large table-sized computing displays such as the company's Surface, rather than phones or tablets.

A projector built into the Surface displays a computer image onto the table top from below. As the user touches it, infrared reflections from their fingertips are detected by cameras beneath the table and used to pinpoint the position of the finger and lend touchscreen capability.

In the patent, Microsoft proposes coating the display with a light-induced shape-memory polymer. This becomes hard and protruding when one wavelength of ultraviolet light is transmitted at a pixel, and soft when another wavelength hits it. By modulating these wavelengths, texture can be created, the patent claims. However, Microsoft never comments on its plans for its patents and it is not yet known how feasible the idea is.

End of keypads

If it works it certainly would be welcome, says Patrick Baudisch, a display interaction expert at the University of Potsdam in Germany, who worked on the Surface in its early days.

"Creating well-defined bumps on a touch surface is in many ways the holy grail of text entry on touch devices because it would enable touch typing at much faster speeds than on touchscreens today," he says.

And if it could be used on smaller devices, it could spell the end of keypads on phones, he believes. "There would be no more reason for mobile keypads – they would simply be emulated when necessary. That could effect massive change in this field."

When this article was first posted, we mistakenly attributed the Disney Research work to researchers at Carnegie Mellon University.

http://www.newscientist.com/article/dn19776-microsoft-develops-shapeshifting-touchscreen.html

Robot arm punches human to obey Asimov's rules

- 13 October 2010 by **Paul Marks**
- Magazine issue 2782.

No pain, no gain (Image: B.Povse, D. Koritnik, T Bajd, M Munih)

ISAAC ASIMOV would probably have been horrified at the experiments under way in a robotics lab in Slovenia. There, a powerful robot has been hitting people over and over again in a bid to induce anything from mild to unbearable pain - in apparent defiance of the late sci-fi sage's famed first law of robotics, which states that "a robot may not injure a human being".

But the robo-battering is all in a good cause, insists Borut Povše, who has ethical approval for the work from the University of Ljubljana, where he conducted the research. He has persuaded six male colleagues to let a powerful industrial robot repeatedly strike them on the arm, to assess human-robot pain thresholds.

It's not because he thinks the first law of robotics is too constraining to be of any practical use, but rather to help future robots adhere to the rule. "Even robots designed to Asimov's laws can collide with people. We are trying to make sure that when they do, the collision is not too powerful," Povše says. "We are taking the first steps to defining the limits of the speed and acceleration of robots, and the ideal size and shape of the tools they use, so they can safely interact with humans."

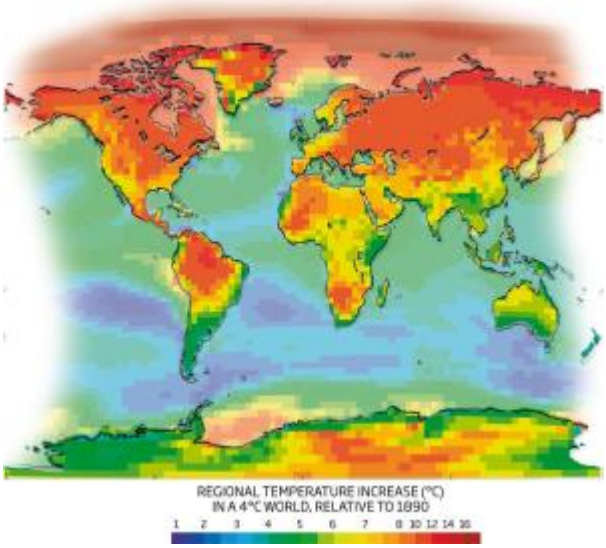
Povše and his colleagues borrowed a small production-line robot made by Japanese technology firm Epson and normally used for assembling systems such as coffee vending machines. They programmed the robot arm to move towards a point in mid-air already occupied by a volunteer's outstretched forearm, so the robot would

push the human out of the way. Each volunteer was struck 18 times at different impact energies, with the robot arm fitted with one of two tools - one blunt and round, and one sharper.
The volunteers were then asked to judge, for each tool type, whether the collision was painless, or engendered mild, moderate, horrible or unbearable pain. Povše, who tried the system before his volunteers, says most judged the pain was in the mild to moderate range.
The team will continue their tests using an artificial human arm to model the physical effects of far more severe collisions. Ultimately, the idea is to cap the speed a robot should move at when it senses a nearby human, to avoid hurting them. Povše presented his work at the IEEE's Systems, Man and Cybernetics conference in Istanbul, Turkey, this week.
"Determining the limits of pain during robot-human impacts this way will allow the design of robot motions that cannot exceed these limits," says Sami Haddadin of DLR, the German Aerospace Centre in Wessling, who also works on human-robot safety. Such work is crucial, he says, if robots are ever to work closely with people. Earlier this year, in a nerve-jangling demonstration, Haddadin put his own arm on the line to show how smart sensors could enable a knife-wielding kitchen robot to stop short of cutting him.
"It makes sense to study this. However, I would question using pain as an outcome measure," says Michael Liebschner, a biomechanics specialist at Baylor College of Medicine in Houston, Texas. "Pain is very subjective. Nobody cares if you have a stinging pain when a robot hits you - what you want to prevent is injury, because that's when litigation starts."

http://www.newscientist.com/article/mg20827826.700-robot-arm-punches-human-to-obey-asimovs-rules.html?full=true&print=true

Royal Society paints picture of a world 4 °C warmer

- 11:44 29 November 2010 by **Michael Marshall**



The average global temperature is likely to be 4 °C higher than in pre-industrial times by 2055 if greenhouse gas emissions are not slowed – that means a 16 °C rise in the Arctic (Source: Met Office Hadley Centre)

As reported by *New Scientist* last year, UK Met Office researchers have shown that the world could warm by 4 °C by 2060, devastating much of the Amazon rainforest and disrupting the monsoon cycle. Now the UK's Royal Society has published detailed study of how the world will look when it is 4 °C warmer.
Water shortages will become more severe, says Fai Fung of the University of Oxford, and colleagues. The extent of the warming depends in large part on our actions. If, by cutting emissions we limit global warming to 2 °C, projections suggest water supplies will dwindle because of demand from the growing population. But at 4 °C, a warmer, drier climate will become the biggest threat to water availability.
Most of sub-Saharan Africa will see shorter growing seasons, according to Philip Thornton of the International Livestock Research Institute in Nairobi, Kenya, and colleagues. As a result, average maize production will drop 19 per cent and bean production by 47 per cent compared with current levels.
Extreme weather, sea-level rise and water shortages will will drive many people to migrate, says François Gemenne of the Institute for Sustainable Development and International Relations in Paris, France. But the poorest may be unable to move. Gemenne says we should make it easier for people to move country.
Journal reference: *Philosophical Transactions of the Royal Society A*

http://www.newscientist.com/article/dn19778-royal-society-paints-picture-of-a-world-4-c-warmer.html

Toxic heavy metals reach top of the world

- 16:31 02 December 2010 by **Michael Marshall**

Mount Arsenic? (Image: Gordon Wiltsie/Getty)

Following in Edmund Hillary's footsteps? Don't drink the water on your way up. Dangerous levels of arsenic and cadmium have been found in snow samples from mount Everest.

Both heavy metals were found at levels higher than those the US Environmental Protection Agency considers acceptable, says Samantha Langley-Turnbaugh of the University of Southern Maine in Gorham.

Langley-Turnbaugh's student Bill Yeo climbed most of the way up Everest in 2006, taking soil and snow samples every 300 metres between 5334 and 7772 metres up. All the snow samples had high levels of arsenic and cadmium, and all the soil samples had high levels of arsenic.

Steep challenge

Mountaineers rely on melted snow for drinking water, so the toxic metals "could be a concern", says Langley-Turnbaugh. It is not clear how much of the pollution makes its way into rivers further down the mountain, where it might enter the local drinking water.

High winds blow the contaminated soil around as dust, so breathing it in could also pose a risk. "People at Everest base camp often wear ventilators, simply because there is so much dust," Langley-Turnbaugh says.

Air pollution from Asian industry is probably to blame. Concentrations of both arsenic and cadmium were higher in the soil further up the mountain, as would be expected if high-altitude winds were depositing them.

Langley-Turnbaugh says there is very little information available about pollution on high mountains like Everest – because to get samples you have to climb them.

Journal reference: *Soil Survey Horizons*, vol 51, p 72

http://www.newscientist.com/article/dn19803-toxic-heavy-metals-reach-top-of-the-world.html

Goodbye grey skies, hello extra warming

- 02 December 2010 by **Michael Marshall**
- Magazine issue 2789.

Turned out nice again (Image: KPA/Zuma/Rex Features)

LOW, grey clouds help keep the planet cool. But as the world warms they will shrink and temperatures will rise ever higher, according to a study that could help to resolve one of the biggest uncertainties in climate science.

As more greenhouse gases enter the atmosphere, more heat is trapped and temperatures go up - but by how much? The best estimates say that if the amount of carbon dioxide in the atmosphere doubles, temperatures will rise by between 2 and 4.5 °C.

That's a big uncertainty for such an important number, and clouds are largely to blame. High-level clouds trap heat, but those at low levels reflect sunlight and cool the planet. So depending on how they change, clouds could push temperatures up or down.

To find out, Axel Lauer of the University of Hawaii at Manoa in Honolulu and his colleagues used a relatively new climate model called the International Pacific Research Center Regional Atmospheric Model (iRAM). The model covers the eastern Pacific and parts of South America, in greater detail than global models. They focused on low-level marine clouds in the eastern Pacific, which have proved particularly tricky to model.

The researchers first tested iRAM's ability to simulate cloud cover between 1997 and 2008, and found it reproduced the amount and pattern of cloud cover and how it changed from year to year. Sixteen other climate models did a poorer job of this. They then ran iRAM for possible scenarios for 2090 to 99. With higher CO_2 levels and temperatures, low-level cloud shrank by up to 10 per cent, letting in even more solar radiation (*Journal of Climate*, vol 23, p 5844).

"If this holds, we will find ourselves at the higher end of [temperature] predictions," says team member Ralf Bennartz of the University of Wisconsin-Madison.

Amy Clement of the University of Miami, Florida, says the study is a milestone in resolving uncertainty. Gavin Schmidt of the NASA Goddard Institute for Space Studies in New York says that what's needed are models with even finer detail, and data on all different kinds of clouds. Nevertheless, evidence is building for a warming influence from cloud changes: Clement's research shows that when the sea surface is warm there is less low cloud cover (*Science*, vol 325, p 460).

http://www.newscientist.com/article/mg20827893.400-goodbye-grey-skies-hello-extra-warming.html?full=true&print=true

Magnetovision: Birds' seventh sense revealed

- 01 December 2010 by **Ed Yong**
- Magazine issue 2788

Masters of magnetism (Image: Arthur Morris/Corbis)

The navigational abilities of birds are turning out to be even more amazing than we thought

IT WAS a bunch of robins that started it. The birds were locked in cages in Frankfurt, Germany, where they were being studied by biologist Hans Fromme. When the time came when they would normally migrate to sunny Spain, Fromme noticed they were becoming restless. What's more, they always tried to flee their cages in the same direction.

This was in the late 1950s, and the thinking at the time was that migrating birds navigated using the sun, moon and stars. The cages were in a shuttered room, though, so the robins must have worked out which direction was which some other way. Magnetism was one possibility. The idea that migrating birds navigate across continents and oceans with the help of an internal compass had been suggested a century earlier by a Russian zoologist, but attempts to prove it had failed.

That changed in 1966, when zoologist Wolfgang Wiltschko showed that the direction in which the robins attempted to escape could be changed by powerful magnets. His work suggested that most birds can sense the Earth's magnetic field, although many of his peers refused to believe it.

"You don't want a stupid little bird doing something you don't do", says Roswitha Wiltschko of the University of Frankfurt, who together with her husband Wolfgang has been studying this ability for four decades. Their studies and others have proved the sceptics utterly wrong; we now know that a wide array of animals, from beetles to bats, rely on the Earth's magnetic field to help them navigate.

But how? The inner workings of this supersense have long been mysterious. Now, though, researchers think they have worked out how birds sense magnetism, and even what these master navigators perceive.

The first clues to the basis of magnetoreception came from a surprising source. In 1975, some bacteria that live in the mud on sea floors were found to contain chains of crystals of iron compounds. As these chains line up with Earth's field, they align the bacteria along with them, ensuring they swim downwards, away from oxygen-rich waters. Essentially, each bacterium is a tiny compass.

That suggested some animals might have cells containing similar crystals, whose movement would allow the animals to sense magnetic fields. Finding such cells, though, proved far from easy. Senses are typically linked to openings in the body that allow organs like eyes, ears and tongues to make contact with the outside world. Magnetic fields, however, pass freely through bone and tissue, so the receptors could be anywhere. "Basic things that you do in other senses don't make sense when it comes to magnetoreception," says Thorsten Ritz, a biophysicist at the University of California, Irvine.

Among birds, magnetic crystals were first discovered in homing pigeons and bobolinks. Nerve endings in the skin inside the upper beak contain lots of bullet-shaped structures rich in iron. It took decades to prove they really are used for magnetoreception, though.
Earlier this year, similar structures were found in robins, garden warblers and domestic chickens. These species hail from diverse lineages, so it now appears that iron-based magnetoreception is common to most, if not all, birds (*PLoS ONE*, vol 5, e9231).

A radical idea

While some researchers were hunting for magnetic crystals in animals, others took a very different approach. Klaus Schulten, a biophysicist now at the University of Illinois at Urbana-Champaign, had been studying some unusual chemical reactions that can be affected by magnetism. He realised that if similar reactions took place in living things, it might enable them to detect magnetism.
Electrons normally dance round a molecule in pairs, but light can break this happy tango by shunting an electron from one molecule to another. The result is a pair of radicals - molecules with a solo electron. Electrons have a quantum property called spin, and in a radical pair the spins of the two unpaired electrons are linked; they either spin together or in opposite directions. The angle of a magnetic field can affect the flipping of the electrons from one of these spin states to the other, and in doing so, it can affect the outcome or the speed of chemical reactions involving the radical pair.
Schulten came up with the idea that radical pairs might help to explain magnetoreception back in 1978. His first paper on it was rejected by *Science* with a note that read, "A less bold scientist might have designated this idea to the waste paper basket." Instead, Schulten published his idea in an obscure journal and kept on refining it.
He realised that because the formation of a radical pair needs light, it probably takes place in the eye. If cells in the retina contained a molecule that formed radical pairs, and each molecule was aligned the same way within the cell, the angle of these molecules - and thus their behaviour in a magnetic field - would change across the bird's hemispherical retina. If the bird could somehow detect the changing patterns across the retina as it moved, it would thus be able to sense the Earth's magnetic field.
A series of studies by the Wiltschkos in the 1980s and 1990s provided some support. They showed that the compass of several bird species requires light. It does not need much light - night-migrating birds like robins get enough - but it does need some. What's more, they found the light has to be from the blue-green end of the spectrum.
As far as anyone knew, though, no molecule capable of forming radical pairs existed in the eye. Then in 1998, Schulten heard about cryptochromes, proteins found in plants and animals that detect blue light. Their main role appears to be keeping internal clocks running on time. What struck Schulten, though, is that when light hits a cryptochrome, the protein transfers one of its electrons to a smaller molecule called FAD - potentially creating a radical pair. "When I heard about cryptochrome, I just fell off my chair," he says. "I realised this was exactly what was needed."

When I heard about it, I just fell off my chair. I realised this was exactly what birds needed to detect magnetism

In 2000, Schulten and Ritz published an updated version of the radical pair hypothesis arguing that the magnetic compass involves cryptochrome and thus depends on blue-green light (*Biophysical Journal*, vol 78, p 707). They predicted that it could be disrupted by high-frequency magnetic fields, which interfere with the flips between spin states. Sure enough, in 2004, Ritz and the Wiltschkos showed that high-frequency magnetic fields can indeed prevent robins from orientating themselves correctly (*Nature*, vol 429, p 177). The same is true of other birds, too.
Then in 2007, Miriam Liedvogel of the University of Oldenburg in Germany found a cryptochrome from the garden warbler can produce a radical pair under blue light that lasts for milliseconds, more than long enough to be affected by the Earth's magnetic field. "It's not 100 per cent proven, but people are very convinced that cryptochrome is involved in magnetoreception," Schulten says.
There are still some loose ends. By knocking out genes, it was recently shown that the compass of fruit flies relies on cryptochromes, and the same appears true for some other insects, including butterflies. Earlier this year, though, a group studying butterflies claimed that the mechanism does not involve radical pairs. Despite this, Schulten remains confident he is right. To settle the issue, he says, we need to work out the structure of cryptochrome, and no one has yet done this.

One thing that is certain is that the compass of birds is located in their eyes. In fact, the tight connection between vision and magnetoreception suggests that birds can literally see magnetic fields.
Schulten has suggested that the fields might appear as areas of light and shade superimposed on top of what birds normally see (see mock-up). This could explain why, earlier this year, Katrin Stapput from Goethe University in Frankfurt managed to disorientate robins by covering their right eyes with frosted goggles (*Current Biology*, vol 18, p 602). Birds may use lines and edges to distinguish between what they actually see and the more fuzzy overlaid magnetic information. If the underlying image is blurred, the birds may no longer be able to distinguish between image and overlay.
Stapput covered only the right eye because the Wiltschkos have found a robin's compass is confined to its right eye, and the same appears true for many migratory birds. That may seem surprising, but since having two compasses provides no extra information, there is no reason to have one in each eye. So far, only garden warblers are known to have compasses in both eyes.
The idea that birds have a heads-up display of their compass is an evocative idea, but still a speculative one. "I'm not Doctor Doolittle," says Schulten. "I can't talk to the animals, although I would love to ask them."

Flying sly

If birds' compasses are located in their eyes, though, why do they also have iron-based magnetoreceptors in their beaks? It turns out that birds actually have two magnetic senses. By monitoring nerve activity, researchers have shown the magnetoreceptors in the beak respond to changes in the intensity of the magnetic field, rather than its direction.
How is not clear. The crystals could be attached to stretch receptors that pick up the tiny forces involved. Alternatively, the moving crystals could open or close molecular gates on the surface of nerve cells, triggering signals.
Whichever, the ability to sense the strength of a magnetic field could be even more helpful than having a compass. Field strength varies from place to place because of varying amounts of magnetic material in Earth's crust, and it is highest at the poles and lowest at the equator. As birds fly around, they could build up a mental map of these magnetic hills and valleys.
To get an idea of how useful such maps could be, imagine being dropped in mountainous terrain in thick mist, and trying to get to a specific location. A compass alone would be of little use. With an altimeter and a contour map instead, you could both pinpoint your location and work out which way to go.
The idea that birds create magnetic maps is supported by studies like those on Australian silvereyes done by the Wiltschkos in the 1990s. They exposed the birds to a strong pulse that altered the magnetism of iron crystals in their beaks but left the eye compass unaffected. In juvenile birds that had just left the nest, this made no difference - they still tried to head in the right direction.
Birds that had migrated before, however, all headed in the wrong direction after the pulse. This suggests that the juvenile birds were relying on the compass in their eyes, whereas the experienced birds were trying to navigate based on their mental magnetic map, using the intensity receptor in their beaks.
Of course in natural situations, birds use a whole range of clues for navigation, not just magnetism. They also use the sun and stars, smells, visual landmarks and perhaps even sounds like waves breaking.
An insight into how they combine these different kinds of information came from a recent study on night-migrating thrushes. When the thrushes were exposed to artificial magnetic fields at sunset, they flew in the wrong direction during the night when released. After seeing the next sunset, however, they corrected their courses. So it appears some birds calibrate their magnetic compasses against the sun each day.
While we have learned much about how birds sense and use magnetism, less is known about other animals (see "Extra sense"). The compasses of lobsters, fish and mammals like the naked mole rat definitely do not rely on the radical pair mechanism and are probably iron-based. The compass of sharks and rays, meanwhile, is thought to rely on a different mechanism entirely: electromagnetic induction. As they swim through a magnetic field, it induces electric currents in a sensory organ - but it remains unclear how sharks achieve the extraordinary sensitivity needed to detect Earth's weak field.
Resolving these mysteries will require teams that can interpret the behaviour of electrons and animals alike. "I can do the quantum mechanics, but then you have to make predictions of what an animal's going to do in a cage," says Ritz. "You have to work across disciplines and be holistic." He adds, "I think that if we look back, we'll view the next decade as the one where some of the big discoveries were made."

Extra Sense

Fish
Many fish, including salmon and trout, can detect magnetic fields, probably using iron-based magnetoreceptors in their noses. The recent discovery that the lab favourite, the zebrafish, can sense magnetism will make it much easier to work out the genetic basis.
Ants and bees
Magnetic crystals of iron compounds are found all over the bodies of ants and bees, especially in the abdomen and antennae, and are thought to act as compasses. One species of migratory ant, *Pachycondyla marginata*, probably gets these magnetic particles from the surrounding soil.
Turtles
From birth, turtles use their magnetic sense as both a compass and a map. Hatchlings can swim homewards even when they are released in a distant and unfamiliar location. Other animals known to use magnetic maps include lobsters and newts.
Bats
Bats not only "see" in the dark using echolocation, they also have a magnetic compass which they calibrate against the sun. Their compass appears to be iron-based.
Humans?
In the 1970s, it was claimed that humans have a magnetic sense, but other researchers could not replicate the results. The idea still intrigues, though. "I'd love to do a study with some indigenous people who orientate in areas with few landmarks, such as Pacific Islanders," says Thorsten Ritz, a biophysicist at the University of California, Irvine.
Ed Yong blogs at http://blogs.discovermagazine.com/notrocketscience/

http://www.newscientist.com/article/mg20827881.600-magnetovision-birds-seventh-sense-revealed.html

Huntington's symptoms appear a decade before diagnosis

- 14:17 02 December 2010 by **Wendy Zukerman**

People with Huntington's disease show symptoms more than a decade before they are likely to get a clinical diagnosis. These early effects of the disease don't affect day-to-day functioning, but they will help drug developers evaluate treatments that target the early stages of the disease.

Huntington's is a fatal and incurable brain condition whereby a faulty gene makes brain cells commit suicide en masse. It causes problems in communication, mental processes and movement.

Within the faulty gene, a specific sequence called CAG is repeated too many times. Although "environmental" factors such as exercise may slow Huntington's progression, the number of CAG repeats accurately predicts the age of illness onset. For example, someone with around 40 repetitions is likely to get their first symptoms in late middle age.

Previous studies have found that several years before the disease manifests itself, the brains of people with the mutation undergo subtle changes, with a thinning of the regions involved in motor function.

To find out whether how these changes affected people with the Huntington's gene before clinical symptoms begin, Julie Stout of Monash University in Melbourne, Australia, and colleagues selected 119 people who had the gene but no symptoms. The volunteers were predicted to get clinical symptoms around 10 years later, on average, based on their age and number of CAG repeats.

Circles within rings

Subjects were asked to draw circles within a ring as quickly and accurately as possible for 45 seconds. They then repeated the task, but with their hands obscured and an image of what they were drawing on a screen in front of them, a task which involves more advanced visual-motor coordination.

The team compared this group with 112 people who did not have the gene and 120 people who already had Huntington's symptoms.

In the first task, the "pre-manifest" group drew an average of 25 circles in 24 seconds, while those without the Huntington's gene drew around 40.

Out of the loop

In the second task the pre-manifest group strayed past the boundaries of the ring more often, says Stout, and took longer to correct errors. "Normally, if you see your squiggle is going out of the circle, you correct it," she says. "But pre-manifest patients were out of the circle for longer."

On average, for every circle drawn, the pre-manifest group made around three errors, while those without the gene made one.

As expected, those with Huntington's were the slowest and least accurate of all the groups in both tests.

Danny Hatters, a molecular biologist at the University of Melbourne, says the study is a convincing demonstration that the Huntington's mutation begins disrupting normal cellular events "very early in age and long before clinical diagnosis", he says. "The more we understand about the early stages of the disease, the better able we will be to develop new drugs."

Journal reference: *Neuropsychologia*, DOI: 10.1016/j.neuropsychologia.2010.11.016

http://www.newscientist.com/article/dn19802-huntingtons-symptoms-appear-a-decade-before-diagnosis.html

Born scared: How your parents' trauma marks your genes

- 02 December 2010 by **Laura Spinney**
- Magazine issue 2788.

What are the implications of trauma on future generations? (Image: Dominique Faget/AFP/Getty)

If your parents have been through war or famine, you're probably genetically primed for more of the same. That's a problem if times have changed

IN the summer of 1982, Israel invaded Lebanon. Although the conflict lasted less than four months, it is notorious for the massacre of hundreds of civilian refugees in Beirut by Lebanese militias, while the Israeli army stood by. Some of the returning Israeli soldiers developed post-traumatic stress disorder, suffering nightmares and flashbacks about what they had seen. When Zahava Solomon, an epidemiologist with the Israeli army, examined the figures, she found that PTSD rates were highest in one particular group: those whose parents had survived the Holocaust in Europe during the second world war.

Publishing her finding in 1988, Solomon suggested that the children of Holocaust survivors might have learned this vulnerability through hearing their parents' stories of what had happened to them. Twenty years on, neuroscientist Rachel Yehuda has a different explanation: their predisposition to PTSD was determined even before they knew who their parents were, when they were still in the womb.

Yehuda, who directs the Traumatic Stress Studies Division of the Mount Sinai School of Medicine in New York City, is one of a growing number of researchers who think that our response to stress is shaped early in life, sometimes even in the womb. Those effects don't change the genes we inherit, but they do alter their activity, via so-called epigenetic mechanisms. This can determine our risk of mental illness in later life - not only PTSD but perhaps also depression, anxiety and other conditions.

The notion that troubled parents are more likely to have troubled children is scarcely new. The relative contributions of genes and the environment have been endlessly debated by politicians, educators and the media. Now the burgeoning science of behavioural epigenetics, also sometimes called neuro-epigenetics, is

helping to tease out the molecular mechanisms responsible. Forget nature versus nurture. "This is about how nurture transforms nature," says Yehuda. "It's saying that the environment is a critical player in how your genetic endowments work."

Yehuda began investigating this field in the 1990s, when she opened a psychotherapy clinic for Holocaust survivors in New York, and received more calls from their adult children. In 1998 she showed that the adult offspring of Holocaust survivors have higher rates of PTSD than the general population (*The American Journal of Psychiatry*, vol 155, p 1163).

Yehuda began investigating her subjects' hormone profiles. When we encounter a threat, our adrenal glands, sitting on top of the kidneys, release a surge of adrenalin and noradrenalin (known as epinephrine and norepinephrine in the US). These hormones cause our heart to race and breathing to accelerate in preparation for fight or flight. Once the threat has passed, the adrenal glands release the hormone cortisol, which winds down our stress response (see diagram).

Low cortisol levels have been linked with PTSD, perhaps because people with this disorder are in a prolonged state of stress. Sure enough, Yehuda showed that her group of Holocaust survivors with PTSD had low cortisol. But she also discovered that their children had low cortisol levels too, and that the more severe the parent's symptoms, the lower the child's cortisol was (*Psychoneuroendocrinology*, vol 27, p 171).

Bad parents

Those findings seemed to suggest that the Holocaust survivors' own response to stress had somehow shaped their children's. But knowing so little about the families it was hard to say how. Had the children learned that response, as Solomon suggested? Was parenting an issue? Or had they somehow inherited the stress response?

Some clues have come from work on rats, in the lab of Michael Meaney, a neuroscientist at McGill University in Montreal, Canada. Female rats vary in how much they lick and groom their newborn pups, falling into two broad groups: attentive mothers, which spend lots of time licking and grooming their young, and neglectful ones, which don't. As adults, neglected rats have a stress response that is more prolonged and easily triggered - they are fearful, skittish and "hypervigilant". It is appealing to draw parallels with people who are neglected as children having more psychological troubles when they grow up.

One way of looking at the animals' behaviour is that the neglectful rats are bad mothers, whose offspring suffer the harmful consequences to their psyche. Alternatively, perhaps they are raising hypervigilant offspring to give them a better chance of survival in a dangerous world. It would make sense, because in a risky environment, rats might have less time for licking and grooming their pups.

Perhaps the supposedly neglectful rats give their pups a better chance in a dangerous world

Markers of abuse

In 2004, Meaney's group reported a fascinating insight into the molecular mechanisms behind this effect. Cortisol winds down the stress response once a threat has passed by binding to what are called glucocorticoid receptors in the brain, including in the hippocampus. Meaney's group showed that neglected rats had fewer glucocorticoid receptors in their hippocampus, and that this was a result of epigenetic changes affecting the activity of the receptor's gene (see "What is epigenetics?"). It seemed as though the early maternal neglect had turned down the gene's "volume control" in the hippocampus, meaning fewer receptors were made, resulting ultimately in an exaggerated stress response.

How well do those findings translate to humans? In 2009, Meaney's group tried to answer that question by studying brain tissue taken from 24 people who had committed suicide. The researchers also tried to find out if their subjects had been abused or neglected as children by interviewing their friends and families.

Those who had been abused had fewer glucocorticoid receptors in their hippocampus than those without such a history - just like the neglected rats (*Nature Neuroscience*, vol 12, p 342). And they had the same pattern of epigenetic changes to the gene's volume control in their hippocampus.

For Yehuda, this was proof that childhood events can cause lasting changes in the way we handle stress. To try to probe just how early in life this kind of programming could happen, she studied a different group of survivors: women who had been at or near the World Trade Center in New York City at the time of the September 2001 attacks, and who had been pregnant at the time. The advantage in their case was that their babies' cortisol levels could be tracked from an early age.

Of the 38 women who were studied, about half had developed PTSD, and these had lower cortisol levels than the rest. More significantly, so did their 9-month-old babies (*Journal of Clinical Endocrinology and Metabolism*, vol 90, p 4115).

Unlike the children of Holocaust survivors, the researchers could rule out storytelling as a mechanism. Whatever was happening was happening very early, in preverbal infants. But because the babies were only tested at 9 months old, it was not possible to say whether the effect resulted from something in the womb, or in their first months of life.

A different kind of study does suggest that cortisol can be affected by prenatal events, however. Jonathan Seckl, a hormone specialist at the University of Edinburgh, UK, who worked with Yehuda on the 9/11 study, saw a research opportunity arising from the great popularity of licorice sweets in Finland. The sweet aniseed taste of licorice comes from a compound called glycyrrhizin, which happens to block an enzyme in the placenta that normally breaks down maternal cortisol and cuts the amount that reaches the fetus. In theory, pregnant women who eat lots of licorice expose their babies to more cortisol.

Seckl's team found that the 8-year-old children of women who had eaten lots of licorice when pregnant - equivalent to 500 milligrams of glycyrrhizin per week, or more - had 20 per cent more salivary cortisol on waking than the children of mothers who ate the least. Alarmingly, it also affected their behaviour. The children in the high-licorice group were more prone to breaking the rules, aggression and attention-deficit hyperactivity disorder (*American Journal of Epidemiology*, vol 170, p 1139).

Why high cortisol is linked to aggression and low cortisol to PTSD is not clear. It is tempting to speculate that aggression is the "opposite" behaviour of fearfulness, but this may be overly simplistic. Sometimes people can be both aggressive *and* frightened; also the licorice studies involve children and the PTSD ones adults.

The idea that babies can be affected by events in the womb gained ground in the 1980s when David Barker, a doctor at the University of Southampton, UK, spotted that undernourished mothers had smaller babies who were more prone to various diseases as adults. Since then it has emerged that such "fetal programming" is part of normal biology, says Mark Hanson, who heads the university's Centre for Developmental Origins of Health and Disease. "Every fetus is exposed to signals from its mum about the world in which she lives," he says. Glucocorticoids are undoubtedly important programming signals, he says, but there are others too, including nutrients and antioxidants that cross the placenta.

In 2004, with Peter Gluckman of the University of Auckland in New Zealand, Hanson proposed that our risk of disease is determined by the mismatch between our programming in the womb and the environment we enter (*Science*, vol 305, p 1733). A child who was malnourished in the womb is well adapted to malnutrition in adulthood. But if they grow up eating a high-calorie diet, then they have a good chance of becoming obese. Perhaps the same is true of hypervigilance, a feature of PTSD and anxiety. "Hypervigilance is maladaptive if there's no threat," says Yehuda. "But if there is a threat, the person who is hypervigilant is going to win."

A good illustration of this is a 1994 study by psychologist Richard Tremblay's group at the University of Montreal in Canada. He showed that in deprived neighbourhoods, timid children were less likely to end up in jail or in the morgue (*Journal of Consulting and Clinical Psychology*, vol 62, p 1044).

Hypervigilance can be an asset. In poor areas, timid children are less likely to end up in the morgue

Food fine-tuner

Seckl, however, thinks that to focus on the stress response, at least in the case of Holocaust survivors, is to miss part of the picture. That's because cortisol is a hormone with a dual function. As well as responding to stress, it also helps to fine-tune our metabolism according to whether food is abundant or in short supply. People incarcerated in concentration camps were not just traumatised but also malnourished.

When food is scarce, cortisol tells the liver to convert stored protein to usable fuel, while in the kidneys it helps hang on to sodium. Under conditions of malnutrition, this seems to be achieved, not by raising blood levels of cortisol, but by cutting the rate at which it is broken down in the liver and kidneys. Last year Seckl and Yehuda found a striking correlation in the Holocaust survivors: the younger they had been at the time of the second world war, the less active were enzymes that break down cortisol in their liver and kidneys (*Journal of Psychiatric Research*, vol 43, p 877).

Seckl thinks the survivors adjusted their metabolism to suit malnutrition, and then passed on that state to their offspring, probably through epigenetic changes to their genes. A vulnerability to PTSD may have been an undesirable byproduct of that adjustment, or a useful adaptation to an environment that was both lacking in food and dangerous.

Epigenetics is still in its infancy, and there are many outstanding questions, not least, how many generations an epigenetic signal can span. Seckl and Meaney have found that in pregnant rats treated with glucocorticoids, the resulting metabolic changes in their offspring also appear in the following generation, although not in the one after that. This appears to be mirrored in people, according to a Swedish study showing a link between childhood nutrition in the first generation studied, and disease risk in their grandchildren (*European Journal of Human Genetics*, vol 14, p 159). If those findings are borne out it would be radical indeed, as epigenetic signals are supposed to be wiped clean in the cells that give rise to sperm and eggs (*New Scientist*, 6 November 2010, p 8).

The news isn't all bad, though. Tremblay describes epigenetics as "a constantly moving story". "The epigenetic changes are occurring every day, through what we eat, what we drink and how we behave," he says. So what is done can sometimes be undone.

It is far too early to start changing medical or social policy based on this kind of research, but studies are now following large groups of people from birth to adulthood, and will look at the impact of early interventions, such as support for parents deemed at risk of neglecting their infants. There is encouraging news from Meaney's lab, in rats at least. Animals born to negligent mothers but fostered in the first week don't develop the exaggerated stress response that characterises their less fortunate littermates.

Trying to prevent the consequences of early trauma may seem appealing, but there is a caveat: whether a trait such as hypervigilance is considered an illness or a means of survival depends on the environment a child grows up to inhabit. As Seckl says: "If you don't understand things in terms of what they're intended for, you'll misunderstand how to cope with them."

What is epigenetics?

It is epigenetic changes to genes that determine if they are turned on or off; in other words, whether the gene's protein is being manufactured or whether the gene is lying dormant. In skin cells, for example, the genes that make skin proteins are turned on, and most others are switched off; in muscle cells the genes that make muscle proteins are active, and so on. Most epigenetic changes occur within the course of an individual's lifetime, but research is now suggesting that some may be passed from one generation to the next.

What does it mean for a gene to be switched off? The DNA is tightly folded up around packaging proteins called histones, in a series of intricate loops and spirals, greatly reducing its volume. This stops the cell's protein-making machinery from accessing the gene and "reading off" its code. In genes that are switched on the DNA has a much more open structure, so that the protein-making enzymes can penetrate.

Genes can be switched on to varying degrees, and there are many different types of epigenetic changes. The two best known are chemical modifications to the DNA or histones. For example, if methyl groups are added to DNA this tightens up its structure and silences the gene, while acetyl groups on the histones open up the structure, switching on the gene.

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http://www.newscientist.com/article/mg20827881.700-born-scared-how-your-parents-trauma-marks-your-genes.html

The danger of unreliable paternity tests

- 01 December 2010 by **Peter Aldhous**
- Magazine issue 2789

(Image: Jose Luis Pelaez/Getty)

Can prenatal blood tests identify a fetus's father? The result could sway a decision to abort but our investigation suggests it isn't always accurate

KATHRYN* was on the brink of booking an appointment at the abortion clinic. In October 2008, she received an email she'd been dreading: the results of a prenatal paternity test suggesting she was pregnant by a man other than her boyfriend.

She was delighted at the prospect of having her boyfriend's baby, but couldn't bear to have the other man's child. "I said to my counsellor that there's absolutely no way I can go through with this pregnancy if it's that guy's," Kathryn recalls.

I told my counsellor I can't go through with the pregnancy if it's that guy's

Fortunately, she decided to have a second test. Conducted by one of the UK's leading forensic genetics labs, this showed conclusively that the other man could not be the father. Today, Kathryn dotes on her daughter and looks back on the incident with horror.

Kathryn is not the only person to have received flawed results from the Canadian laboratory that ran the initial test she purchased. In an investigation covering similar cases, plus samples we submitted ourselves, *New Scientist* has discovered errors made by the lab, including DNA profiles for fetuses and possible fathers that are inconsistent with the known ancestry of the human genome. It even generated a DNA profile for a "fetus" when the woman tested was not actually pregnant.

The test is run on a sample of the woman's blood and cheek swabs from possible fathers. Our investigation suggests that the results are unreliable - with potentially devastating consequences. "Paternity testing can have profound effects on people's lives and, when there is an unborn child involved, may lead to a termination," says Denise Syndercombe Court of Barts and The London School of Medicine and Dentistry, who ran the follow-up test for Kathryn.

Selling genetic tests direct to the public is a burgeoning industry, with people turning to their DNA to explore their health and probe their ancestry as well as to resolve contested paternity.
Our findings highlight the potential dangers of allowing companies to operate without regulation and quality control. Paternity testing labs are free to operate without accreditation unless they offer results for use in court. "This has been able to fly under the radar," observes Gail Javitt, a lawyer with the Washington DC firm Sidley Austin, who has studied the regulation of genetic testing.
Kathryn and other pregnant women who ordered the blood test were keen to avoid a procedure called an amniocentesis. This is normally used to detect fetal abnormalities such as Down's syndrome, and involves inserting a needle into a pregnant woman's belly to take a sample of amniotic fluid containing cells from her fetus. The procedure carries a small risk of miscarriage, so genetic testing labs have been working on methods of isolating fetal DNA from a pregnant woman's blood.
Geneticists have had some success in developing tests on maternal blood to detect fetal genes that are not also carried by the mother. For instance, it's possible to determine fetal sex by detecting sequences from the male Y chromosome. But these methods have not easily translated to paternity testing.
Despite this, several websites offer prenatal paternity tests based on a woman's blood. Quoted prices start at about $960 and while the technical descriptions differ a little from site to site, for those *New Scientist* found, the tests are run by a lab in Toronto, Canada, operated by a company called the Health Genetic Center. The lab's director is Yuri Melekhovets, who trained as a geneticist in Moscow, Russia.
The lab began to develop a blood test for paternity in 2000. By 2002, some customers who sought a second opinion from labs running standard paternity tests had received contradictory results, suggesting that the blood test was prone to error. And the following year, an Arizona court ordered that one of Melekhovets's companies, and a firm called Genetest, which had sold his prenatal blood test, should pay substantial damages to one couple who were given an incorrect result (see "Four lives changed forever"). The action brought against these firms was not defended and a representative of the Toronto lab said that Melekhovets had never been made aware of the ruling.
One company, the Paternity Testing Corporation (PTC) of Columbia, Missouri, has run tests for several customers of the Toronto lab, and found that its conclusions about paternity were inaccurate. "We have identified a series of errors over the course of the past eight years," says Joe Gorman, PTC's general counsel.
After learning of these cases, and other errors identified by Syndercombe Court's lab at Barts, *New Scientist* decided to investigate further, focusing on recent tests.
The Toronto lab's testing procedures have evolved over time. Initially, it claimed to concentrate small numbers of fetal cells from the woman's blood. Today, the lab's prenatal testing website stresses the use of "cell-free" fetal DNA, which passes across the placenta from fetal cells that have broken down.
The lab has also shifted from testing genetic markers known as short tandem repeats (STRs), which are standard in paternity testing, to recording single letter variants in the genetic code known as single nucleotide polymorphisms, or SNPs, which are rarely used for this purpose. Reports from the lab obtained by *New Scientist* listed SNP variants on the X chromosome and chromosome 1 when the fetus was female, and on the Y chromosome when the fetus was male.
It should actually be fairly easy to detect Y chromosome DNA in a pregnant woman's blood, since she has none of her own to confuse the analysis. But when we showed the results for two cases from 2008 involving male fetuses to specialists on the Y chromosome's evolutionary history, it became clear that something was awry: the combinations of SNP variants reported were inconsistent with the Y chromosome's known ancestry (see "Implausible chromosomes").
We approached Melekhovets with this information. His representative said that it was not relevant because the lab does not perform ancestry testing. However, any correct test of Y chromosome SNPs, whether performed to test ancestry or not, will give results that fit with its ancestral tree. "They should have been able to use the Y chromosome tree to see that inconsistency," says Peter Underhill, who studies the human Y chromosome at Stanford University in California.
What about cases where the fetus is female and testing the Y chromosome isn't an option? In these cases, discriminating fetal sequences from the larger quantity of maternal DNA is more challenging - as Gordan Lauc of the University of Osijek in Croatia has shown. Lauc specialises in analysing mixed samples of DNA. He honed his skills identifying victims of the conflict that erupted after Yugoslavia broke apart. When Lauc tried to run paternity tests on fetal DNA from the blood of pregnant women, he managed to confirm the

paternity of male fetuses by looking for STRs on the Y chromosome. But for female fetuses, he could not reliably extract fetal DNA (*International Journal of Legal Medicine*, vol 123, p 75).

Where DNA is hard to isolate, one danger is obtaining "false positive" results. To probe whether the Toronto lab's test is prone to this problem when there is no Y chromosome DNA in a woman's blood, we submitted a sample from a woman who claimed to be seeking a prenatal paternity test, but in reality had never been pregnant. We also sent in cheek swabs from two potential "fathers".

We reasoned that the lab would first look for Y chromosome markers in the blood, and fail to find them. We wanted to know if its procedures would also correctly detect that there was no female fetal DNA in the sample. When the report came back, it included a profile for a non-existent fetus, which listed 11 SNP variants across the X chromosome and chromosome 1.

When the report came back, it included a profile for a non-existent fetus

This "phantom" fetal profile was not the only problem. We asked Syndercombe Court's lab, which is experienced in SNP typing, to test samples from the same three adults. The results showed that Melekhovets's lab had also incorrectly recorded one SNP variant from the woman and one of the alleged "fathers".

When we presented Melekhovets with our findings, his representative said that the lab generally receives samples from pregnant women and questioned the relevance of our samples to its everyday operations.

Kathryn's case had provided an opportunity to investigate the lab's performance when a woman is really carrying a female fetus. Her boyfriend refused to be tested, so she sent in a sample from the other man. When the results came back, the report stated that he "could not be excluded" as the father and that her fetus was "unlikely to have similar matches with a random man". However, it recommended that "all alleged fathers" should be tested.

Unsure what to believe, Kathryn sought a second test from Syndercombe Court. Using fetal cells extracted by amniocentesis, this showed that the man tested was definitely not the father (*Forensic Science International: Genetics*, DOI: 10.1016/j.fsigss.2009.10.002).

In running the test for Kathryn, Syndercombe Court's team used STRs. So to investigate the accuracy of the Toronto lab's results, *New Scientist* asked her to retest the samples for the SNPs tested by the lab, again on the X chromosome and chromosome 1. This revealed that Melekhovets's lab had typed Kathryn and the man correctly, but had made errors with the fetal DNA for at least four SNPs, one of which would have excluded the man had it been recorded correctly.

Melekhovets's representative did not accept that his lab had made these errors and suggested that our analyses were at fault. He also pointed out that the cases we had highlighted involved customers who had only tested one father, which goes against the lab's recommendation to test all possible fathers.

The representative declined to give details of the lab's procedures, arguing that these were trade secrets. He stated that the protocols were based in part on "excellent research data" published by other laboratories. The lab's prenatal testing website does list a series of published papers, however none of these describe a reliable SNP-based prenatal paternity test used on maternal blood.

Until regulators decide to subject paternity testing to more rigorous scrutiny, women may continue to receive inaccurate results, with potentially disastrous consequences. "I would have terminated," says Kathryn. "There's no doubt about that."

**The name has been changed*

Four lives changed forever

Kimberly Robbins got pregnant around the time she was splitting up with her boyfriend, and starting to see a colleague, Milan Jeknich. Anxious to know who the father of her fetus was, she ordered a prenatal paternity test from a firm called Genetest. This stated with a 99.9 per cent probability that Jeknich was likely to be the father.

"I had to tell my ex it wasn't him. He was devastated," says Robbins. Jeknich had hoped to go to law school, but that plan was shelved as he and Robbins started caring for baby Brayden.

But the timing of Brayden's birth didn't seem right, so Jeknich asked Robbins to run another test with a different lab. When the results came in, he was ruled out as the father. A further test, carried out by a third lab, gave the same result. "Her world was rocked. My world was rocked," Jeknich recalls. He moved out for several years but still helped care for Brayden.

Now the two are back together. Brayden's biological father is not in his life. "Had the first test come out the other way, he and Kimberly might have tried to work things out," says Jeknich.

Angry about the disruption to their lives, Jeknich sued. No one defended the case, and in May 2003 a court in Phoenix, Arizona, awarded damages of $1 million to Jeknich and Robbins, although not a cent has been paid. Genetest has since ceased trading. When presented with documents from the case, a representative of Yuri Melekhovets, director of the lab that performed the test for Genetest, said that Melekhovets had never been made aware of the ruling.

Implausible chromosomes

When a Canadian laboratory started using genetic markers called single nucleotide polymorphisms, or SNPs, as the basis for its prenatal paternity tests, it opened its results up to scrutiny based on the deep ancestry of the Y chromosome.

This chromosome is unusual in the human genome, having no partner with which to exchange genetic material. As a result, it is inherited as a single unit down the male line, slowly acquiring SNP mutations. This makes it possible to draw up an evolutionary tree of how human Y chromosomes have evolved over time. Each branch of that tree corresponds to a certain combination of SNPs and a man can only be a member of one branch.

New Scientist examined two reports that were sent in 2008 to two pregnant women. In each case, the lab tested 11 SNPs for a male fetus, recorded an identical profile for a suspected father and then concluded that the man could not be excluded as the father. In both cases, it stated that a random man was "very unlikely" to share the same SNP profile as the fetus.

Yet the particular SNP variants documented in these reports would place both women's male fetuses, and their alleged fathers, onto three branches of the tree simultaneously (see one example). These results are biologically implausible, say experts on the Y chromosome.

New Scientist also arranged for samples from the four individuals to be tested at another laboratory, led by Denise Syndercombe Court of Barts and the London School of Medicine and Dentistry. The alleged fathers still matched the fetuses, but the profiles differed from those provided by the Canadian lab for five SNPs in one case, and seven in the other.

The Barts profiles were consistent with the Y chromosome tree. In one case, the true branch, or haplogroup, for fetus and alleged father was R1, the most common haplogroup in men of European descent. Indeed, based on the true profile for the tested SNPs in this case, millions of men would match the fetus. Conventional paternity tests, based on more informative genetic markers, have shown that in each of the two cases the man tested was not the father.

A representative of Yuri Melekhovets, the director of the Canadian lab, did not accept that the lab had made errors and said that it no longer uses the SNPs we highlighted as giving implausible results. If customers provide samples for all alleged fathers, as the lab advises, the representative said that further SNPs are tested until all but one alleged father can be excluded.

http://www.newscientist.com/article/mg20827893.200-the-danger-of-unreliable-paternity-tests.html?full=true&print=true

Untreated diabetes reduces vital brain cholesterol

- 16:06 01 December 2010 by **Jessica Hamzelou**

Untreated diabetes could reduce the amount of cholesterol available to the brain. A deficit of cholesterol has been linked to Alzheimer's and other neurodegenerative diseases.
Ronald Kahn and his colleagues at Harvard Medical School in Boston compared gene expression in brain samples from mice with type 1 or type 2 diabetes against those of healthy mice.
The activity of genes involved in cholesterol production in the hypothalamus – an area involved in the brain's energy maintenance – was reduced by 25 per cent in both groups of diabetic mice. But when these were treated with insulin, the effect was reversed.
Cholesterol also supports neuronal communication by helping the cells form connections to each other.
The findings offer exciting new insight into the links between insulin signalling and cholesterol production in the brain, says Geert-Jan Biessels at University Medical Centre in Utrecht, the Netherlands. "It is still much too early to draw any conclusions on the implications for human diabetic patients," he adds.
Journal reference: *Cell Metabolism*, in press

http://www.newscientist.com/article/dn19792-untreated-diabetes-reduces-vital-brain-cholesterol.html?full=true&print=true

Haiti's cholera outbreak will go from bad to worse

- 11:07 30 November 2010 by **Debora MacKenzie**

A Haitian child with symptoms of cholera is carried to a hospital (Image: KeystoneUSA/ZUMA/Rex Features)

The cholera epidemic in Haiti is just getting started. Disagreements over who, or what, was responsible for the epidemic continue, and health agencies predict the situation will get much worse before cases start falling. Yet good vaccines are going unused. *New Scientist* rounds up the latest news.

What is happening in Haiti?

Cholera broke out in Haiti on 19 October, and from the outset doctors feared they could not contain it. The bacteria spread in water contaminated with infected faeces. Only half the population of Haiti had access to proper sanitation, and only a third had clean drinking water, even before the devastating earthquake in January. Now conditions are even worse. As a result, cholera has spread throughout Haiti, and as of 29 November, the outbreak had caused 1721 deaths.

That's just for starters. Epidemics grow exponentially: case numbers rise slowly at first, then take off. Cholera cases in Haiti are rising faster than predicted, and health agencies now forecast that 400,000 people will be infected in this outbreak, at least half in the next three months. Only 2.3 per cent of cases are leading to death, partly because many get prompt rehydration therapy, but ominously doctors are already struggling with the current case load.

Why is cholera such an emergency? Wasn't Haiti already plagued with disease?

Yes, but not cholera. The seventh pandemic of cholera, currently ongoing, started in south Asia in 1961 and hit Peru in 1991. It hadn't reached the Caribbean before, so Haitians have had little experience with managing cholera, and no immunity. This strain also carries a virulent toxin found in earlier pandemics.

Isn't there a vaccine?

There are three vaccines, all oral and made of dead cholera bacteria. One has been used successfully in emergencies among refugees in Asia and Africa. Another appears to work in one dose, rather than the usual

two, so could protect people fast enough to slow a cholera epidemic in mid-outbreak, says John Clemens of the International Vaccine Institute in Seoul, South Korea.

Yet the Haitian government's strategy for fighting this outbreak does not mention vaccines. The problem, says Peter Hotez of George Washington University in Washington DC, is there are "too few doses on hand". People in regions in which cholera is prevalent, such as Africa, do not use much vaccine as the immunity the vaccines elicit does not last long. Vaccines are mostly used by travellers, so only small quantities are produced.

Cheap, single-dose vaccines made of live weakened bacteria that confer long-term immunity could change that, and are in "advanced stages of development", says Matthew Waldor of Harvard Medical School in Boston. But for now, Waldor, Clemens and Hotez, writing in *The New England Journal of Medicine* are calling for a global stockpile of cholera vaccine so there will be enough for emergencies such as Haiti. The World Health Organization already stockpiles yellow fever and meningitis vaccines.

Cholera bacteria are found naturally in the ocean. Could this have caused the outbreak?

Cholera bacteria live in copepod plankton, and multiply with them when the copepods' food, marine algae, blooms in spring. This causes some seasonal outbreaks, notably in Bangladesh. But Colin Stine at the University of Maryland in Baltimore believes that most epidemics are caused by person-to-person spread, as environmental levels of virulent cholera are rarely high enough to infect people. Many Haitians believe Nepalese peacekeeping troops inadvertently introduced the bacteria.

Even so, there have been reports suggesting that the source was environmental. However, "the genetic and epidemiologic evidence that human activities account for the introduction... is overwhelming," Waldor told *New Scientist*.

This is because the strain is genetically closest to south Asian samples, and because the first cases were inland along the Artibonite river, not the coast. The distinction is important, says Waldor, because "it means we can alter our practices to prevent such devastation in the future".

http://www.newscientist.com/article/dn19781-haitis-cholera-outbreak-will-go-from-bad-to-worse.html?full=true&print=true

DNA trick throws ageing into reverse

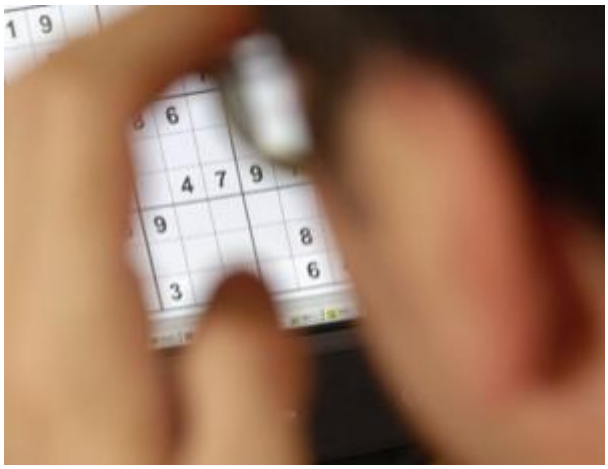
- 16:05 29 November 2010 by **Cian O'Luanaigh**
- Magazine issue 2789

A technique to keep the tips of your chromosomes healthy could reverse tissue ageing. The work, which was done in mice, is yet more evidence of a causal link between chromosome length and age-related disease.
Telomeres, the caps of DNA which protect the ends of chromosomes, shorten every time cells divide. But cells stop dividing and die when telomeres drop below a certain length – a normal part of ageing. The enzyme telomerase slows this degradation by adding new DNA to the ends of telomeres.
Mariela Jaskelioff and her colleagues at the Dana Farber Cancer Institute in Boston, Massachusetts, engineered mice with short telomeres and inactive telomerase to see what would happen when they turned the enzyme back on. These mice had shorter lifespans, atrophied organs and smaller brains than mice that hadn't been engineered.
Four weeks after the team switched on the enzyme, they found that tissue had regenerated in several organs, new brain cells were developing and the mice were living longer.
Journal reference: *Nature*, DOI: 10.1038/nature09603

http://www.newscientist.com/article/dn19780-dna-trick-throws-ageing-into-reverse.html?full=true&print=true

Problem-solving bacteria crack sudoku

- 17:27 16 November 2010 by **Frank Swain**



Not just a human pursuit (Image: Nick Cunard/Rex Features)

The appeal of sudoku has spread to the prokaryotic world. A strain of *Escherichia coli* bacteria can now solve the logic puzzles – with some help from a group of students at the University of Tokyo, Japan.
"Because sudoku has simple rules, we felt that maybe bacteria could solve it for us, as long as we designed a circuit for them to follow," says team leader Ryo Taniuchi.
The team begin with 16 types of *E. coli*, each colony assigned a distinct genetic identity depending on which square it occupied within a four-by-four sudoku grid. The bacteria can also express one of four colours to represent the numerical value of their square. As with any sudoku puzzle, a small number of the grid squares are given a value from the beginning by encouraging the bacteria in these squares to differentiate and take on one of the four colours.
These bacteria then use RNA recombinases packaged in viruses to send information about their location in the grid – and their colour value – to the undifferentiated bacteria in "unsolved" grid squares. The *E. coli* are "programmed" to accept RNA only from cells in the same row, column or block as themselves. The genetic information stored in the viral messages forbids the receiving bacteria from differentiating into the same colour as the transmitting bacteria, so by a process of elimination the undifferentiated cells establish which colour to adopt to "solve" the grid.
By expanding these principles, 81 types of bacteria could solve a full nine-by-nine grid, says Taniuchi.

Spread the load

Programming bacteria is not new, but there's a limit to how much DNA you can insert into their genome. Spreading the code across many cells allows for more complex programs by creating a distributed network.
"By this parallel calculating, bacteria can fill in all the sudoku cells simultaneously, which is impossible for human beings," Taniuchi says.
Martyn Amos at Manchester Metropolitan University, UK, is a member of Bactocom, a project funded by the European Union to develop a biochemical computing device. "If you consider an ant colony, an individual ant isn't very useful," he told *New Scientist*. "But if you put millions of ants together they're suddenly capable of very rich, very complex population-level behaviour. That's what we're trying to harness."
The Tokyo team's sudoku-solving bacteria competed in the International Genetically Engineered Machine competition at the Massachusetts Institute of Technology last week.

http://www.newscientist.com/article/dn19733-problemsolving-bacteria-crack-sudoku.html?full=true&print=true

Sea of photons made to act as one 'super-photon'

- 24 November 2010 by **Kate McAlpine**
- Magazine issue 2788.

One for all and all for one (Image: MerryMoonMary/iStock)

A SEA of photons has been coaxed into acting as one for the first time. The feat, proposed by Albert Einstein and Satyendra Nath Bose in 1925, could help shrink the size of electronic devices.

Close to absolute zero, some atoms and molecules have been made to form a quantum material called a Bose-Einstein condensate (BEC). In this material, the particles are all in their lowest possible energy state and behave as a single entity.

However, despite Einstein and Bose's prediction, cajoling photons to drop into their lowest energy state and form a BEC has proved difficult. This is because the unruly particles of light become absorbed by the surrounding material when cooled, rather than shedding their energy.

Now Martin Weitz of the University of Bonn in Germany and colleagues have managed to lower photons' energies without losing them. "This is the main trick of the experiment," Weitz says. And they did it at room temperature.

First, the team placed two concave mirrors 1 micrometre apart, and filled the lens-shaped cavity between them with a red liquid dye. They then fired a green laser at the cavity. The dye absorbed photons from the laser and re-emitted them at lower-energy yellow wavelengths, which the mirrors focused at the centre of the cavity. While some photons were indeed absorbed by the mirrors, the large number present in the laser more than made up for this.

When the low-energy photons at the centre of the cavity reached a density of about a trillion photons per cubic centimetre, they began to act as a single photon, shifting in appearance from a blurry glow to a bright point (Nature, DOI: 10.1038/nature09567). "All the photons marched in lockstep," Weitz says.

The photons began to act as one, shifting in appearance from a blurry glow to a bright point

Zoran Hadzibabic of the University of Cambridge says the result completes the theoretical journey that Einstein and Bose started 85 years ago. "With this work, the circle is closed," he says.

Weitz says the work could help further shrink electronic devices. Ultraviolet light has a short wavelength, making it an ideal tool to burn small patterns onto computer chips. But UV lasers are difficult to make. If UV photons can be cooled in the same way that the optical photons in this study were, a photon BEC could serve as a new high-energy UV photon source, Weitz says.

http://www.newscientist.com/article/mg20827884.000-sea-of-photons-made-to-act-as-one-superphoton.html

Cloud lasers: Hunting quantum secrets in the skies

- 30 November 2010 by **Kate Ravilious**
- Magazine issue 2788.

Cloud power (Image: Oliver Polanski)

Jupiter's Great Red Spot may get its colour from an unexpected quantum effect – one that we could use to generate power from clouds here on Earth

FORTY years ago, in what was then the Soviet Union, physicist Mark Perel'man had an outlandish thought. It took him a further seven years to show that his thought might have substance, and 30 or so more years to be taken seriously. The problem for Perel'man was that his idea overturned the established view of a familiar physical process, one that occurs every time a gas condenses into a liquid or a liquid freezes solid.

It might sound esoteric, yet if Perel'man's theory is correct it will have far-reaching consequences. It could transform the way we manufacture materials such as metals, help explain why Jupiter's Great Red Spot is red, and provide the basis of an early-warning system for storms and tornadoes on Earth. It might even unlock an untapped source of renewable energy hidden in the sky.

Perel'man emigrated to Israel in 2006, and he was working at the Hebrew University of Jerusalem when he died in August this year. By then, though, others had become convinced that he was on to something and are now keen to explore it. "I definitely intend to continue to investigate this, particularly with energy and environmental issues in mind," says Quinn Brewster of the University of Illinois at Urbana-Champaign. "I am confident that it is a real effect," says physicist Peter Townsend of the University of Sussex in Brighton, UK. Yet other researchers contacted by *New Scientist* remain sceptical: "My take on it is that it's wrong," says Graeme Ackland at the University of Edinburgh, UK. So what is going on?

The argument hinges on the details of a process called a phase transition. Phase transitions occur all around us: as ice cubes melt in a glass of gin and tonic, for example, or as water vapour condenses to form clouds. What specifically interested Perel'man were condensation and freezing. These are both exothermic phase transitions, involving the release of heat. Freeze water, for instance, and as ice starts to form, the water molecules become locked into crystals where they can only vibrate. As a result they lose some energy of motion, releasing it as heat.

It had always been assumed that this so-called latent heat could escape via two processes: thermal conduction - as atoms or molecules knock into each other and pass on their excess heat energy - or as black body radiation, the radiation given off by all objects, with a characteristic spectrum that depends on the object's temperature.

In the 1960s, however, Perel'man began to suspect that another mechanism was involved. He was thinking about the quantum mechanics of condensation and freezing, and started to wonder how the electrons in the

material might be affected. Quantum theory tells us that these electrons occupy discrete energy levels, and that they can emit photons if they make a jump to a lower energy level.
Perel'man speculated that this mechanism could provide another way for a material to lose heat as it condenses or freezes. It was a notion that ran counter to mainstream physics. "At the time these ideas seemed completely fantastical and heretical," Perel'man told *New Scientist* shortly before his death. Yet his thinking caught the attention of the prominent Soviet physicist Andrei Sakharov. Buoyed by his support, Perel'man published his idea in the journal *Physics Letters A* in 1971 (vol 37, p 411).
Perel'man realised that he needed clear experimental evidence to back up his theory. Time and again he and his colleagues ran careful experiments in which they froze water or condensed steam, but each time they failed to detect the faintest glimmer of electromagnetic radiation. Nevertheless, Sakharov maintained his interest and at one stage even suggested conducting experiments in his own kitchen, Perel'man recalled.
After much brainstorming, Perel'man finally worked out where he might have been going wrong. The photons were there, he reckoned, but they were being absorbed by water vapour in the air before they could reach the detector. He froze water again, this time in a partial vacuum, and sure enough, the detector spotted infrared radiation at wavelengths between 28 and 40 micrometres. He redesigned the apparatus to study water vapour condensing and, as droplets formed, he recorded another infrared burst, this time between 4 and 8 micrometres. In both cases, he showed that black body radiation alone could not explain the results. Perel'man and his colleagues presented their findings in several Russian-language publications and at conferences in the Soviet Union. Yet the results received little attention elsewhere, even when published in *Physics Letters A* in 1977 (vol 60, p 143).
It wasn't until Perel'man arrived in Israel, 30 years after his original experiments, that he was able to put his ideas on a firmer theoretical footing. And it was then that Vitali Tatartchenko, a Russian crystallographer working at glass manufacturer Saint-Gobain in France, contacted him.
It turned out that Tatartchenko had been studying the same idea independently, also for over 30 years. In the 1970s, while at the Institute of Solid State Physics in Moscow, he had detected infrared radiation emitted by various metals and salts, and even sapphire - a form of aluminium oxide - when they crystallised out from a molten state. These experiments were hugely challenging, since the phase changes took place at high temperatures. "Sapphire was especially difficult because it has a melting point of 2050 °C," Tatartchenko recalls.
What intrigued him was the possibility that this radiation could offer a new way to control the manufacture of certain materials. Imagine a molten metal or semiconductor that can solidify into several different types of molecular structure, each with its own associated latent heat. He reasoned that it might be possible to steer the solidification process towards a specific structure by beaming in light at a specific wavelength related to the transition energy. This would stimulate emission from the melt, he thought, in much the same way as photons inside a laser cavity stimulate an avalanche of light emission, and at the same time trigger the desired phase change.
Tatartchenko wanted to work with Perel'man to develop a theoretical model of the process, more to convince others that the effect was real than to find any sort of practical application. The pair began by collating previous research on electromagnetic radiation in phase transitions, and compared the data with standard results in laboratory handbooks. In 2007, they published their conclusion - that the effect is genuine (*Physics Letters* A, vol 372, p 2480).
Ackland is not so sure. "I'm unconvinced by their experimental evidence," he says. He says that any changes in atomic or molecular motion during phase transition are too gradual "to produce any kind of effect needed to generate electromagnetic radiation at a characteristic frequency".
Bradley Stone, a physical chemist at San José State University in California, is keeping an open mind. He says there is no particular reason why latent heat should not be released directly as infrared radiation. "But I'd like to see independent corroboration by others before I am absolutely convinced," he says.
Roy Sambles at the University of Exeter, UK, says that Perel'man and Tatartchenko's idea is plausible. The electronic energy levels in atoms can be modified by neighbouring atoms, he says, though he suspects any shift in the levels would be tiny. "The problem is to compute what effects this may have," he says.
A recent study by Brewster and graduate student Kuo-Ting Wang goes some way towards doing this. They have come up with a model that seems to explain how electromagnetic radiation can be emitted when water condenses, and they even calculate the spectra that we should see.

According to Brewster, when a molecule of water vapour condenses - by attaching itself to the surface of a water droplet via a hydrogen bond - its sudden loss of mobility, combined with a change in the distribution of electric charge across the molecule, force it to lose a relatively large amount of energy. The best way for it to do that is to kick out a photon. "There is a lot of energy that needs to be liberated and this model provides the possibility of photon release," says Brewster. Using his model, he calculates that condensing water vapour will emit infrared radiation at wavelengths between 4 and 8 micrometres (*International Communications in Heat and Mass Transfer*, vol 37, p 945). "Theory suggests the probability of this is very low, which is why many scientists are sceptical, but we have to keep an open mind."

Tatartchenko says the finding explains why clouds emit infrared radiation at wavelengths between 6.5 and 7 micrometres - a range monitored by weather satellites recording cloud formation. Until Brewster's model linked these wavelengths with water vapour condensing, there had been no detailed physical mechanism to explain why clouds emit so much radiation in this range.

Tatartchenko calculates that up to 5 per cent of the latent heat released when water condenses could be in the form of radiation. And with vast quantities of water vapour in the atmosphere, he believes that this process represents a significant yet previously ignored energy pathway. If confirmed, says Stone, "this mechanism might need to be taken into account in atmospheric and climate models".

This mechanism might need to be taken into account in atmospheric and climate models

This is not, however, a line of reasoning that convinces Joshua Wurman, an atmospheric scientist from the Center for Severe Weather Research in Boulder, Colorado. There is already a perfectly good explanation for the infrared radiation we see in Earth's atmosphere, Wurman says. It is simply black body radiation. Atmospheric water vapour emits this radiation mainly in the infrared range, he says, and that is what satellites are detecting. "Their idea makes no sense," he says.

Tornado warning

Tatartchenko agrees that some of the infrared radiation detected by satellites will be black body radiation, but insists that phase transitions make a significant contribution too, particularly when clouds are forming at extreme altitude or in the polar regions, where the atmosphere is very dry. In these situations the radiation will be able to reach weather satellites easily as there is little water vapour en route to absorb it. "The amount of infrared radiation emitted from cloud droplets is still not adequately explained," he says.

The amount of infrared radiation emitted from clouds is still not adequately explained

If Perel'man and Tatartchenko have stumbled across a genuine effect, is it anything more than just a minor curiosity? Tatartchenko certainly thinks so. He suggests that watching for intense atmospheric infrared emissions could provide early warning of hurricanes and other violent storms. Observations with radar or in visible light can't warn us that a storm is brewing until it is too late, he says: the storm clouds are already there by the time we can detect their water vapour. He thinks infrared observations could reveal a storm before it has fully formed, provided the contribution from black body radiation can be untangled (*Reviews on Advanced Materials Science*, vol 20, p 58). "I think that the intensity of the radiation is proportional to the speed of the cloud formation," he says.

And why should this mechanism be confined to our skies? Tatartchenko suggests it could help explain the colour of the Great Red Spot, the vast storm whirling around in Jupiter's southern hemisphere. He thinks that when ammonia and water vapour condense and solidify in the planet's upper atmosphere, they give off radiation that extends from the infrared into the long-wavelength end of the visible spectrum - in other words, red light.

Tatartchenko has an even more radical proposal. He thinks that a beam of infrared photons at precisely the right wavelength could stimulate emission from moisture in the air and trigger cloud formation. It's not the clouds themselves he is interested in, though: his idea is to harness the energy locked up in moist air. The trick, he says, would be to set up a pair of parallel mirrors with a constant supply of cool, moist air flowing between them. Shining a beam of infrared photons into this space should trigger the formation of water droplets, releasing more infrared radiation in the process.

If the mirrors are carefully aligned, the radiation should bounce back and forth through the moist air, stimulating even more emission. Tatartchenko says this will amplify the incoming beam. In other words, it will create a sort of cloud laser. By extracting a little of the beam - perhaps by making one mirror slightly transparent, as in a regular laser - he suggests that such a device could be used to generate usable energy. Assuming about 8 per cent of the light emitted by the water is kept inside the cavity, Tatartchenko calculates

that a pair of 1-square-metre mirrors would produce 2000 watts - an output 20 times as great as that of a typical silicon solar cell of the same size (*Earth Science Reviews*, vol 101, p 24).
Ackland is sceptical that it could ever work. Using this putative mechanism to drive a laser would require consistent conditions over time, he says. "Clouds and fog are not noted for this property," he points out. And even if there is something to it, says William Rossow at the NASA Goddard Institute for Space Studies, this process is insignificant, since it would have to compete with the very efficient thermal emission process.
Townsend, who studies light emission from semiconducting crystals, also doubts the cloud laser is practical, but he is certain Tatartchenko's emission mechanism is genuine. Consider how many molecules there are in a raindrop, he says. If just one-millionth of the drop's latent heat of condensation goes into infrared radiation by Perel'man and Tatartchenko's mechanism, "there would be millions of photons released", he says.
Clearly Tatartchenko needs more evidence. In the past few months he returned to Russia to talk to the Russian Space Agency in the hope of organising further experiments. If funds materialise, he will make additional measurements of the spectrum of radiation emitted as water vapour condenses. He also wants to test his cloud laser concept by building one "on the slopes of a mountain, at an altitude of around 3000 metres". Brewster too plans experiments, but on a less ambitious scale. "To start with I'd like to do simple cloud chamber experiments and measure the radiation for myself," he says. It's hardly surprising that researchers are sceptical, he says, but no one should dismiss new ideas out of hand. "Theory is always evolving in the face of experimental evidence."
Kate Ravilious is a science writer based in York, UK

http://www.newscientist.com/article/mg20827881.500-cloud-lasers-hunting-quantum-secrets-in-the-skies.html

How to create temperatures below absolute zero

- 01 December 2010 by **David Shiga**
- Magazine issue 2789.

Negative temperatures are even "hotter" (Image: Croisy/Shutterstock

ABSOLUTE zero sounds like an unbreachable limit beyond which it is impossible to explore. In fact there is a weird realm of negative temperatures that not only exists in theory, but has also proved accessible in practice. An improved way of getting there, outlined last week, could reveal new states of matter.

Temperature is defined by how the addition or removal of energy affects the amount of disorder, or entropy, in a system. For systems at familiar, positive temperatures, adding energy increases disorder: heating up an ice crystal makes it melt into a more disordered liquid, for example. Keep removing energy, and you will get closer and closer to zero on the absolute or kelvin scale (-273.15 °C), where the system's energy and entropy are at a minimum.

Negative-temperature systems have the opposite behaviour. Adding energy reduces their disorder. But they are not cold in the conventional sense that heat will flow into them from systems at positive temperatures. In fact, systems with negative absolute temperatures contain more atoms in high-energy states than is possible even at the hottest positive temperatures, so heat should always flow from them to systems above zero kelvin.

Creating negative-temperature systems to see what other "bizarro world" properties they might have is tricky. It is certainly not done by cooling an object down to absolute zero. It is, however, possible to leap straight from positive to negative absolute temperatures.

Objects can't be cooled to absolute zero, but you can leap straight to negative temperatures

This has already been done in experiments in which atomic nuclei were placed in a magnetic field, where they act like tiny bar magnets and line up with the field. The field was then suddenly reversed, leaving the nuclei briefly aligned opposite to the direction in which they would have the lowest energy. While they were in this state they fleetingly behaved in a way consistent with them having negative absolute temperatures, before they too flipped over to line up with the field.

Because the nuclei can only flip between two possible states - parallel to the field or opposite to it - this set-up offered only limited possibilities for investigation. In 2005 Allard Mosk, now at the University of Twente in the Netherlands, devised a scheme for an experiment that would offer more knobs to turn to explore the negative temperature regime.

First, lasers are used to herd the atoms into a tight ball, which is in a highly ordered or low-entropy state. Other lasers are then trained on them to create a matrix of light called an optical lattice, which surrounds the ball of atoms with a series of low-energy "wells".

The first set of lasers is then adjusted so that they try to push the ball of atoms apart. This leaves the atoms in an unstable state, as if they were balanced on a mountain peak, poised to roll downhill.

The optical lattice acts like a series of crevices along the mountainside, however, halting their progress. In this state, removing some of the atoms' potential energy, letting them roll away from each other, would lead to greater disorder - the very definition of a negative temperature system (see graph).
Mosk's ideas have now been refined by Achim Rosch of the University of Cologne, Germany, and colleagues. Their proposed experimental set-up is essentially the same, but Rosch and his team's calculations bolster the case that it is feasible.
Crucially, they also suggest a way to test that the experiment would create negative temperatures. Since the atoms in the negative-temperature state have relatively high energies, they should move faster when released from the lattice than would a cloud of atoms with a positive temperature (*Physical Review Letters*, DOI: 10.1103/PhysRevLett.105.220405).
"The new work shows that achieving negative temperatures in this new way in the laboratory is realistic," says Mosk, who was not involved in the new study. "That is something I would be very excited to see."
Rosch and his colleagues are theorists, not geared up to perform the experiment, but they think a team of experimentalists could test their proposal within a year or so.
Using a combination of lasers and magnetic fields, the atoms in the set-up could be made to attract or repel one another at a range of different strengths. "One can use this to explore and create new states of matter and play with them in regimes we are not used to," says Rosch. This is uncharted territory, he says, and it may hold some surprises.

http://www.newscientist.com/article/mg20827893.500-how-to-create-temperatures-below-absolute-zero.html

Stem cell trial for blindness gets green light

- 16:36 22 November 2010 by **Andy Coghlan**
- For similar stories, visit the **Stem Cells** Topic Guide

Twelve people left almost blind by a hereditary condition that strikes in childhood are to receive the world's first eye therapy derived from human embryonic stem cells (hESCs).
The treatment is for Stargardt's macular dystrophy, which affects 1 in 8000 people in the US. Their sight deteriorates from around age 6 when retinal pigment epithelial cells (RPEs) start to die off rapidly, possibly due to a defective gene. Without RPEs to support and nourish them, adjacent photoreceptor cells which capture light signals, die too and blindness is the result.
People in the trial will be those whose vision has deteriorated to the point where they can see the movement of their own hand, but little else. They will receive injections into their eyes of between 50,000 and 200,000 RPEs.
"The goal is to halt the rate of photoreceptor loss," says Robert Lanza, chief scientist at Advanced Cell Technology (ACT) of Worcester, Massachusetts, the company that has been developing the treatment since first turning hESCs into RPEs in 2004. By implanting new RPEs, which do not contain the defective gene, the team hopes to prevent further deterioration or perhaps even reverse it.

Vision in six months

"We will hopefully show safety, and we may be able to see improvements in vision in as little as six months," says Lanza.
It will be relatively easy for the team to monitor the fate of the new cells because they can be seen in the eye through a microscope. They can also be removed if there are any adverse effects.
This contrasts with the first trial of an hESC-derived treatment for spinal cord injuries, which began in October. There is no way of knowing the fate of the injected cells.
"Stargardt's is an ideal indication," says Lanza. "There's a definitive endpoint, for measuring visual acuity."
Surgeons will inject the cells into the retina in the space usually occupied by RPEs, directly adjacent to the photoreceptor cells.

Macular degeneration next

In the coming weeks, ACT will apply to the FDA to conduct a separate trial in age-related macular degeneration, in which ageing of RPEs eventually causes blindness, a condition affecting 30 million people worldwide.
Other stem cell eye researchers were delighted with the news. "It's fantastic news that they are going into the clinic with a cell therapy for eye disease," says Pete Coffey of University College London, and head of a team developing tiny "patches" of RPEs for treating age-related macular degeneration.
Lanza says the first volunteer could be treated within around 2 months at one of the half-dozen eye hospitals around the US collaborating in the trial. Treatments based on hESCs for a whole range of conditions from diabetes to heart disease are also moving towards trials, as *New Scientist* reported last year.

http://www.newscientist.com/article/dn19755-stem-cell-trial-for-blindness-gets-green-light.html

Virginia Tech, Carilion teams with physician to create digital version of ER pediatric response chart
06 December 2010 Virginia Tech
A well-known paper-based medical chart used by pediatric emergency personnel across America is undergoing a 21st century boost in an collaborative effort between Virginia Tech's College of Engineering, Roanoke-based Carilion Clinic Children's Hospital and the physician who created the original method some 25 years ago.
The Broselow Pediatric Emergency Tape – otherwise known as the Broselow Tape -- has been a staple of ERs and child trauma units for nearly three decades. Created by Hickory, N.C.-based physician James Broselow, the Broselow Tape is a long, durable tape measure used on a child during a medical emergency. Using a color coded-format, it provides specific medical instructions – amounts of medicines to dispense or level of shock voltage to emit from a defibrillator, for instance – to medical caregivers based on the height and then subsequent weight of the child.
This information now will be displayed on a large LCD monitor within emergency rooms, for all personnel to see.
"We are converting the existing Broselow Tape into an electronic format to improve resuscitation team communications and patient safety," said Dr. Andre A. Muelenaer Jr., an associate professor of pediatrics at the Virginia Tech Carilion School of Medicine (http://www.vtc.vt.edu/), adjunct professor at Virginia Tech-Wake Forrest University School of Biomedical Engineering and Science (http://www.sbes.vt.edu/), and director of the Pediatric Medical Device Institute, located in Roanoke, Va.
Additional displayed information will include medicines administered to the patient, including the time of administration and the next scheduled allotment. In the instance of burns, an automated calculation of the affected surface area will be displayed, along with automated calculation of fluid resuscitation.
A click of a mouse/remote control can move responders from one screen to another. The software running the newly-dubbed eBroselow software program runs on LabVIEW, owned by National Instruments. Known as TEAM Broselow, the method is being tested at various hospitals, including facilities in Roanoke, Va., Austin, Texas, and Winston-Salem, N.C., and will be fine tuned as additional input comes in from doctors, nurses and other medical personnel, said Muelenaer.
Many of the new features already include input from medical personnel around the country, Muelenaer said. One example: The ability to track by barcode-scan the exact types and amounts of medicine administered to the patient. "The idea is to give multiple people access to the same info, on a big screen," said Al Wicks (http://www.me.vt.edu/people/faculty/wicks.html), an associate professor of mechanical engineering (http://www.me.vt.edu/) at Virginia Tech, who serves on the Pediatric Medical Device Institute's leadership team with Muelenaer.
Much of the work to digitize the Broselow Tape for display on LCD televisions was completed by Carlos Guevara, a Virginia Tech master's graduate student in mechanical engineering from El Salvador who recently became an American citizen. Emergency medical personnel still will rely on the physical laminated tape to determine the child's care-need level, before utilizing the digital display version.
"Doing this was a rather simple task," said Guevara. "The challenges arose in an attempt to take advantage of current technology in order to develop a much more enhanced device, such as using the available drug concentration information to calculate volume to administer once a drug has been scanned."
The idea for a digital version of the Broselow Tape came two-fold, hundreds of miles apart. In Hickory, Broselow was working with a collaborator on a Web-based adaptation as far back as three years ago. Meanwhile, more than a year ago, Stacy Steans, a pediatric physician at Roanoke's Carilion Clinic Children's Hospital, had his own epiphany about converting the paper-based data to a wireless format displayed on a monitor. Eventually, Steans and Muelenaer at Carilion, the Virginia Tech College of Engineering and Broselow himself all came together to work on the process.
"We got together, we showed them what we had developed and they showed us what they had developed," said Broselow, who developed the tape after moving from a private practice set-up to emergency room, and seeing the need for large medical teams to have set standards for child emergency care response. "The initial

content on the large screen was a combination of what their thinking was and the content information we had."
Funding for the project came from the Childress Institute for Pediatric Trauma. Rural hospitals, such as those located throughout Southwest Virginia, could benefit most from the software device, more so than urban hospitals with high-capita populations of children. "There are not as many children, so there are not as many cases," he said.
The tape itself is designed for children twelve years old or younger, and having a maximum weight of roughly 80 pounds. Separately, Broselow and his company (http://www.zolstice.com/products.html) are continuing work on several digital formats for emergency rooms of all types and additional user formats such as iPhone applications and several publications, plus additional emergency response needs such as wounds sustained from chemical weapons.
http://www.eng.vt.edu/

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91583&CultureCode=en

Evaluating community pharmacy management of minor ailments

06 December 2010 Pharmacy Practice Research Trust

As part of its objective to provide evidence of effective patient outcomes and the economic value of pharmacist interventions, the Pharmacy Practice Research Trust (PPRT) has awarded a major grant to the Centre of Academic Primary Care, University of Aberdeen for a two year research programme to investigate community pharmacy management of minor ailments.

The research programme, to be led by Dr Margaret Watson, Senior Research Fellow at the Centre of Academic Primary Care, aims to derive evidence that will inform recommendations regarding the future delivery of minor ailments services in community pharmacies in the UK. It will be undertaken across Scotland and England by a multidisciplinary research team from the Universities of Aberdeen and East Anglia plus NHS Grampian and will focus on:

- a systematic review of published and non-published data
- identifying ailments that appear to have the highest impact on the workload of high cost services, ie GPs and A&E
- evaluating different models of delivery of care which compares both costs and patient outcomes
- research into the triggers to seeking care for minor ailments from pharmacies
- evaluating pharmacists' consultation and diagnostic skills in these areas and their impact on patient outcomes

Dr Watson said: "A major review of community pharmacy NHS minor ailment schemes was published in 2002 but since then there has been no systematic collation of the evidence of effectiveness or cost-effectiveness of these schemes. We hope that our research will generate a range of outcomes which can be used to inform future policy, practice and futureresearch initiatives. For example, we are aiming to identify which ailments that can be treated in community pharmacies are still being presented for treatment in the higher cost settings of A+E and general practice plus a multi-disciplinary consensus on which ailments are suitable for treatment in the community pharmacy setting."

Beth Allen, PPRT Director said: "The treatment of minor ailments in community pharmacy is a topic we identified as needing further research in order to develop a robust evidence base which can be used to inform future service, policy development and delivery. We hope that this research programme will provide sufficient evidence for the wider provision of pharmacy interventions in this area, as well as stimulating opportunities to secure funding for future research."

Ends

http://www.pprt.org.uk

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91580&CultureCode=en

Infected prosthetic knees cause problems

06 December 2010 Lund University

Last year 12 700 knee replacement operations were carried out in Sweden. Most such operations go well, but some patients are affected by bacterial infection in the joint and have to be re-operated. This is a complicated procedure that does not always produce successful results, as shown in a thesis by Anna Stefánsdóttir from Lund University in Sweden.

The number of people that undergo an operation to have a prosthetic knee joint is increasing. One reason is that the population is getting older, another is that people are also getting heavier, which is a factor in the development of osteoarthritis. The number of knee replacement operations has increased by 9 per cent a year in recent years.

“So if 1–2 per cent of the operations lead to bacterial infection, then the need for revision – re-operation – will also increase”, says Anna Stefánsdóttir.

This often involves two operations. First, the old prosthesis is removed and temporarily replaced with bone cement, while the patient is treated with antibiotics to eradicate the infection. This takes 6–8 weeks and during this time the patient can usually remain at home. Then a further operation follows to insert a new prosthesis.

In some cases it is not possible to put in a new prosthesis. These patients can be treated with an arthrodesis, or removal of the prosthesis (which leaves the leg without a real knee joint, often confining the patient to a wheelchair). In exceptional cases the infection leads to amputation.

Anna Stefánsdóttir has reviewed almost 480 cases of revision knee replacement between 1986 and 2000.

“Over time more patients have received a new knee prosthesis and fewer are treated with an arthrodesis, but still there are many people who do not get rid of the infection. Other studies show that those who have to have a second operation because of an infection are less satisfied than those who have to have their knee joint changed because the prosthesis has come loose or become worn”, she says.

Therefore it is important that the healthcare service does its utmost to avoid infection in the wound. This means having good ventilation in the operating theatre, ensuring the doors are tightly closed, and ensuring that preventive antibiotics are given at exactly the right time before the operation.

“It is also important to be observant of wound complications. If an infection is discovered in time, it is possible to open the wound and clean out the bacteria before they have had chance to spread. Newly operated patients should have a ‘VIP lane’ so that they can go straight to the hospital orthopaedics department and not have to go via primary care”, says Anna Stefánsdóttir.

In Ms Stefánsdóttir’s view, re-operations due to infection should be centralised to specialist units, because they require such close cooperation between orthopaedists and infectious disease specialists. Nowadays, there are orthopaedics clinics that only carry out one such operation a year, which makes it more difficult to establish the right routines.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91571&CultureCode=en

Reducing maternal and newborn deaths globally

06 December 2010 Liverpool School of Tropical Medicine
On Tuesday 7 December 2010, maternal health professionals from Africa and Asia will be attending a workshop in Liverpool to discuss the effects of 'Making It Happen', a programme with a life-saving training package for health care providers at its heart. Participants will share successes and lessons learned from this maternal and newborn health intervention, to better determine how the programme can be scaled-up.
Supported by the UK's Department for International Development (DFID), UNICEF and other bodies and in partnership with the Royal College of Obstetricians & Gynaecologists (RCOG), the Making It Happen programme is evaluating the effect of this intervention on reducing maternal and newborn mortality and morbidity in five countries - Kenya, Sierra Leone, Zimbabwe, Bangladesh and India. Representatives from those countries, alongside DFID and RCOG will be visiting Liverpool School of Tropical Medicine (LSTM) to develop future strategies for reducing maternal and newborn deaths within those countries.
The availability and quality of Essential (Emergency) Obstetric and Newborn Care (EOC & NC) both demonstrably increased by delivering this country-adapted competency-based training package to healthcare providers of different cadres. Working together with many volunteer staff retired from or still working in the NHS, the Making it Happen programme is delivering a sustainable intervention by ensuring there are Master Trainers or Facilitators in each country as well as Supportive Supervisors who help implement changes within the workplace.
Since piloting the training package in 2007, almost 3000 health care providers have been trained through the LSTM team, leading to improved knowledge and skills that result in a better quality of clinical practice: notably improved care of women with eclampsia; better monitoring of labour; improved resuscitation of the

baby; improved ability to deliver twins and breech presentations; improved management of haemorrhage and upskilling of, for example, midwives who are now able to perform procedures previously restricted to doctors.
Head of LSTM's Maternal and Newborn Health Unit and Principal Investigator Dr Nynke van den Broek said: "A renewed focus on supporting health care porviders of all levels to give truly Skilled Birth Attendance and manage obstetric emergencies correvtly is saving lives of both mothers and babies in each of the countries involved in the Making it Happen programme and ensures that this crucial health care is available to all women 24 hours a day."
Professor James Walker, Senior Vice-President of RCOG said: "The RCOG is proud to be part of this programme where so many of its Fellows and Members volunteer so readily. The training provided helps the local healthcare providers to increase both the capacity and sustainability of high level care where it is so desperately needed. The success of the programme is due to the combination of dedication of all the country partners, the willingness of the volunteers and the keenness of the participants."
http://www.lstmliverpool.ac.uk/about-lstm/news-and-media/press-releases/reducing-maternal-and-newborn

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91577&CultureCode=en

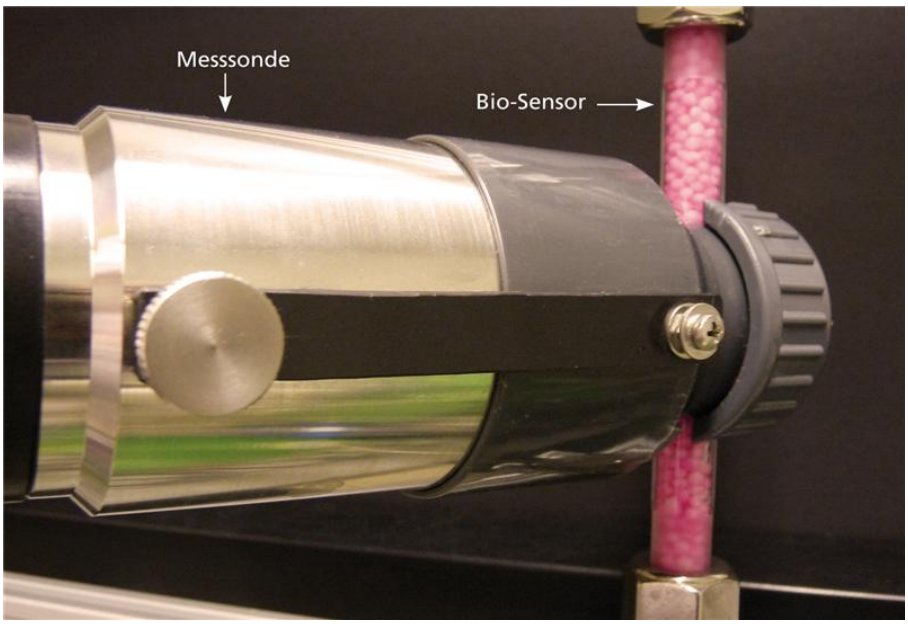
Sweden's first doctoral thesis in Accounting Law presented

06 December 2010 University of Gothenburg
- Extensive study of the International Financial Reporting Standards (IFRS)
Researcher Kjell Johansson at the University of Gothenburg, recently presented Sweden's first doctoral thesis in Accounting Law. The thesis deals with the principle 'substance over form' and fair presentation of economic reality in accounting, and his findings may benefit professionals, standard setters and academia alike. The investigation results in a descriptive model – the so-called circular flow model – and in a descriptive theory on economic reality.
The literature on Accounting Law is relatively limited, a fact that Kjell Johansson wants to change with his research. Johansson feels that the field is becoming increasingly important as our world is becoming more and more internationalised. The concept of substance over form is fundamental within international accounting and has Anglo-Saxon roots. Johansson says that, in a Swedish context, the concept constitutes a new approach to accounting.
'International accounting has clearly influenced Swedish practices in recent decades, and this has for example led to more rules. The external information that businesses are obliged to provide has therefore become regulated to a larger extent, which has changed the field of accounting,' says Johansson.
The study systematically explores accounting standards regarding inventories, property plant and equipment, investment property, intangible assets, construction contracts, finance and operating leases and a few other issues to assess whether these can express substance over form and reflect the economic reality of the company and/or the market. The investigation also identifies cases where the overriding rule concerning fair presentation might be applied. In order to illustrate and explain, Johansson utilises typical cases. Johansson believes that his thesis also can be read to understand how the principle-based norms are constructed and to gain arguments to design an accounting policy in connection with application.
The study results in a descriptive model to give a fair presentation of economic reality, the so-called circular flow model, and a descriptive theory on economic reality.

'The circular flow model describes the life cycle of an asset and a liability in a company and also eight components that form the starting-point of a descriptive theory on economic reality in Accounting Law: the life cycle theory. In addition, I present a normative theory: the dimension theory. The purpose of this theory is to supply tools both to improve existing accounting standards representing economic reality and to develop new ones,' says Johansson and continues:
'The life cycle theory and the dimension theory can be thought of as starting-points for further development of a theory within the field of Accounting Law. The thesis also presents a method to improve existing accounting rules or to develop new ones as well as a method that can be used to analyse accounting norms and that can be applied in legal argumentation.'
The thesis has been successfully defended.
http://gupea.ub.gu.se/handle/2077/23822

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91574&CultureCode=en

The taster in your water line



06 December 2010 Fraunhofer-Gesellschaft
Although drinking water is monitored more strictly than almost anything, our water supply network is still not immune to accidents, wear and tear or targeted attacks. A one-minute warning system for toxins and other substances in water hazardous to health could set off alarms in future if there is a danger.
It is supposed to be cool, colorless, tasteless and odorless. It may not have any pathogens or impair your health. This is the reason why drinking water is put to a whole series of screenings at regular intervals. Now, the AquaBioTox project will be added to create a system for constant real-time drinking water monitoring. At present, the tests required by the German Drinking Water Ordinance are limited to random samples that often only provide findings after hours and are always attuned to specific substances. In contrast, the heart of the AquaBioTox system is a bio-sensor that reacts to a wide range of potentially hazardous substances after just a couple of minutes. It works on the taster principle. That is, some drinking water is diverted from the main line through the sensor in a branching descending line and it contains two different strains of bacteria and mammalian cells. On the one hand, these microscopically small bacteria have a large surface that guarantees quick material turnover and reacts to toxic substances within minutes. On the other hand, the mammalian cells clinch the results because of their close relationship to the human organism and they also extend the range of reactions. This is how Dr. Iris Trick from the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB in Stuttgart, Germany sees it: “We tested various classes of substances that might occur in water – even though they shouldn’t – and to date our sensor has reacted to each of these substances.” She developed the bio-sensor in joint efforts with her colleague Dr. Anke Burger-Kentischer.
The micro-organisms in the sensor were modified so that they produce a protein that has a red fluorescence. The fluorescence changes if it comes into contact with toxic substances. A highly sensitive camera system that the Karlsruhe, Germany-based Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB came up with has an analysis unit that registers even the most minute changes in fluorescence and then analyzes them automatically. Dr. Thomas Bernard, the group manager at the IOSB, tells us why: ”The monitoring unit has a machine-learning process for learning from historical data which fluctuations in the physical, chemical and biological parameters are normal. It sets off an alarm if an unusual pattern shows up in the signals.” The bio-sensor reacts to the smallest quantities of hazardous substances and Dr. Trick provides the explanation: “Our sensor can document even very slight concentrations.” Let’s not

forget that classical poisons such as cyanide or ricin as well as plant protectives or toxic metabolic products from bacteria can be fatal even in concentrations of nanograms per liter.
They have to guarantee optimum life conditions for the microorganisms to operate the bio-sensor on a permanent basis. This is the reason why the researchers at the IOSB have come up with a system that automatically monitors and regulates important parameters such as temperature and inflow of nutrients.
Another component of the Aqua-BioTox system is a daphnia toximeter of their Kiel, Germany-based project partner bbe Moldaenke, who noticed that water fleas react particularly sensitively to nerve poisons. They are testing this monitoring system in a closed performance route on the grounds of Berlin‘s water company, that is incidentally another partner in this project. The idea behind it is making the system as small and cost-effective as possible so that a network of sensor units communicating with one another could be installed that is distributed over sensitive points in the drinking water network.
http://www.fraunhofer.de/en/press/research-news/2010/12/water-bio-sensor.jsp

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91568&CultureCode=en

UNIVERSITY OF GOTHENBURG

Social stress leads to atherosclerosis

06 December 2010 University of Gothenburg
Studies on genetically engineered mice show that social stress activates the immune system and accelerates the development of atherosclerosis. Commonly used drugs to reduce blood pressure, however, may stop this process. This is the conclusion of a thesis presented at the University of Gothenburg, Sweden.
Several large studies have clearly shown that there is a correlation between psychosocial stress and the risk of developing cardiovascular disease. However, little is known about why this is the case.
"The aim of my thesis was to study the underlying mechanisms by which stress leads to atherosclerosis and subsequent cardiovascular disease", explains Evelina Bernberg, researcher at the Department of Molecular and Clinical Medicine, at the Sahlgrenska Academy.
The study has been conducted using mice that have been genetically modified to spontaneously develop atherosclerosis. Using mice as experimental animals allows the scientists to study cause and effect relationships in a controlled situation.
"We found that situations that disrupt the social environment in which the mice normally live increased atherosclerosis, while more physical forms of stress did not", explains Evelina Bernberg.
The scientists discovered that social stress increased blood levels of different markers of inflammation - which previously have been shown to accelerate the development of atherosclerosis.
"When the sympathetic nervous system is activated, adrenalin is released and this increases the heart rate. We also found some evidence that the sympathetic nervous system is responsible for the release of these inflammatory markers", Evelina Bernberg relates.
This release could be reduced by commonly used blood pressure medication, beta-blockers. The same beta-blockers also reduced atherosclerosis and the release of inflammatory markers in unstressed mice, showing that the sympathetic nervous system plays an important role in the development of atherosclerosis.
"Our studies suggest that social stress that activates the immune system is also the type of stress that can lead to the development of atherosclerosis, but we need to confirm whether our studies on gene-modified mice also reflect the situation in humans. It is possible that commonly used beta-blockers to a certain extent may prevent stress from leading to atherosclerosis", says Evelina Bernberg.
ATHEROSCLEROSIS
Atherosclerosis is initiated when cholesterol enters the blood vessel wall and atherosclerotic plaques are formed. Atherosclerosis is the major underlying cause of cardiovascular disease, such as angina, myocardial infarction and stroke. Diseases related to atherosclerosis cause 40-50% of deaths in Sweden.
The thesis has been successfully defended.
http://hdl.handle.net/2077/22934

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91562&CultureCode=en

'Women smokers shocked into giving up habit'

06 December 2010 British Psychological Society (BPS)

Seeing the effect smoking will have on their faces shocks women into giving up the habit, research from Staffordshire University has revealed.

A paper on the research, entitled 'Women Smokers' Experiences of an Age-appearance Anti-smoking Intervention: A Qualitative Study' has been published today, Monday, December 6, in the British Journal of Health Psychology, published by BPS Journals in partnership with Wiley-Blackwell.

Using state-of-the-art morphing technology, researchers have been able to produce images of how smokers will age if they continue to smoke and if they stop.

The technique has been so successful that over two thirds of participants in the project said they will quit smoking as a direct consequence of seeing how their appearance will change.

The research has been funded by Stoke-on-Trent NHS Primary Care Trust (PCT).. It has involved 47 women aged between 18 and 34 years of age.

Professor Sarah Grogan, Project Lead and Professor of Health Psychology, said: "Using state-of-the-art age progression software we have been able to take a picture of women's faces and show them how they will age if they smoked and if they stopped.

"We found that women were very concerned about the impact of ageing on their faces in general and in particular the additional impact of smoking on their skin.

"Many experienced a physical shock reaction, including reports of nausea, to seeing how they would age if they continued to smoke.

"And they reported being highly motivated to quit smoking as a result of the intervention and many said that they would take active steps to quit having seen how they would look if they continued to smoke."

As well as Professor Grogan, the other members of the research team at Staffordshire University are Keira Flett, Research Assistant, and Professor David Clark-Carter.

They plan to retest the research participants, six months after they took part in the intervention, to determine whether they continued to smoke. But from the success of initial feedback, it is hoped the technology can be used more widely.

Professor Grogan said: "This is the first research investigating age-progression morphing software in this country, and we're hoping that eventually the findings can be implemented in stop smoking services across the UK."

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91559&CultureCode=en

Hard to tell whether CSR has a positive effect on profitability or not

06 December 2010 University of Gothenburg

– New thesis presents CSR ranking tool to be used by rating agencies

The meaning of CSR is very broad, and there is still no consensus on how it should be defined, according to research at the University of Gothenburg, Sweden.

Corporate Social Responsibility (CSR) is now a familiar concept and everyday fare for most companies and organisations, not least investment analysts. But the meaning of CSR is very broad, and there is still no consensus on how it should be defined, which is problematic when measuring CSR and the effects of CSR activities. This is particularly evident when it comes to CSR's impact on financial performance, as examined by researcher Cristiana Manescu from the University of Gothenburg's School of Business, Economics and Law in her thesis "Economic Implications of Corporate Social Responsibility and Responsible Investments".

The main aim of Manescu's research was to look at how companies' engagement with CSR impacts on financial performance, and to identify the mechanisms through which it does so. This research is part of the Sustainable Investment Research Platform, financed by MISTRA, the Swedish Foundation for Strategic Environmental Research. Manescu has analyzed sustainable investments from two perspectives: that of companies and that of financial markets. The results reveal that CSR activities do not generally have a negative effect on profitability, but that in the few cases where they have a positive effect, this effect is rather small. On the other hand, the study finds that financial markets react relatively strongly and negatively to negative news about companies' CSR efforts, but do not react to positive CSR performance news.

Manescu emphasizes the fact that, as CSR is a concept that spans many dimensions, in many cases being not even well defined, it is difficult to assess a company's CSR achievements fairly and comprehensively by a single representative number. This is partly because her research shows that different dimensions of CSR have different effects on profitability. To be able to construct a meaningful CSR performance index, Manescu's thesis puts forward the usefulness of a mathematical tool for evaluating a company's overall CSR achievements relative to other players in the same industry, for use by ranking agencies, for example.

"When I began my research five years ago, sustainable investment was a relatively new concept in the financial world," she says. "The field has grown hugely since then and now plays an important role in rankings and various indices. This highlights the importance of discussing how we can best measure CSR and rank companies accordingly, so that we can then make valid assessments of their financial risk and performance."

Manescu has also looked at financial markets' reaction to CSR activities and the CSR return premium – the amount CSR adds to a company's stock return. Her study identifies and explores two main explanations for their reaction, which require further study, she believes.

"On the one hand, companies engaging with CSR might be viewed as high-risk players because they're either committing substantial resources to unnecessary CSR activities or because CSR is used as a distraction from unflattering corporate behaviour, and are, therefore, earning higher returns. On the other hand, good performance can be viewed as a surprise that can be attributed to the company's CSR engagement, previously not taken into account, a kind of mispricing. Mispricing is found as the more prevalent explanation, because the CSR premium has decreased in recent years, perhaps also because most companies are now communicating their CSR activities better."

Manescu says that the results of her thesis will be useful mainly for large investors such as public pension funds and by market analysts such as rating agencies, but they may also be useful for investors more generally when it comes to understanding financial products and their risk for which CSR might be an important factor. The thesis has been successfully defended.

http://www.hgu.gu.se/Files/nationalekonomi/Sem/101112%20Manescu%20avh.pdf

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91553&CultureCode=en

Training the computer scientists of the future

06 December 2010 Manchester, The University of
Computer scientists of the future will benefit from top of the range doctoral teaching at a new facility at The University of Manchester.

The University has been awarded a £2.2m grant to establish the Centre for Doctoral Training in Computer Science, the first of its type in the UK,

The centre, funded by the Engineering and Physical Sciences Research Council (EPSRC), will admit at least 75 students over the next five years.

Students admitted to the centre will be given the chance to become 'the complete researcher', and is a significant commitment to expenditure on studentships at a time when funds are in short supply.

Students admitted to the centre will receive training in all aspects of the research process; creativity and innovation, research problem solving in collaboration with industrial users and carrying out research with real world impact. At the same time students will complete significant research in collaboration with world-leading academic staff.

The University won the grant despite strong competition from other leading computer science departments across the UK. The awarding panel felt strongly that the proposal represented an excellent opportunity to make a real impact to doctoral training in the UK.

Professor Steve Furber, director of the new centre, said: "We are delighted to have been chosen by EPSRC for

this flagship Centre for Doctoral Training in Computer Science, and look forward to rising to the challenge of using this opportunity to transform computing PhDs in the UK."

Dr Jonathan Shapiro, manager of the centre, said: "Manchester Computer Science has unsurpassed breadth of research and the highest level of government research funding in the UK, and now houses the EPSRC Centre for Doctoral Training in Computer Science.

“This makes Manchester an excellent to place to carry out a PhD in Computer Science.”

The funding came from the EPSRC’s Information and Communications Technologies programme
http://www.manchester.ac.uk/aboutus/news/display/?id=6478

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91550&CultureCode=en

Europe leads the way to high performance computing

06 December 2010 Eureka

The EUREKA ITEA 2 software Cluster ParMA project has developed advanced technologies to exploit multicore architectures in semiconductor chips and so deliver substantial performance improvements for high-performance computing (HPC). ParMA technology has established new goals in modelling and simulation and enabled the development of innovative computer-intensive applications to accelerate research in many domains. It offers substantial improvements in applications such as virtual prototyping to reduce costs and accelerate design of new products. The results are already being exploited in applications such as: the Bullx HPC platform, one of the world's best supercomputer; the UNITE development tool package which includes a full set of interoperable tools for advanced debugging and analysis; and RECOM simulation software for an automatic 3D simulator.

Efficient computational power is a key differentiator for both research and industry. It is instrumental in modelling, simulation and engineering design. Until relatively recently, it had long been possible to increase the power of processors by boosting the clock frequency. However, ever smaller device sizes combined with ever greater processing needs has meant that physical constraints such as heat dissipation, power consumption and leakages required an alternative approach. Manufacturers tackled this by putting several processors working in parallel onto the same die – the basic silicon chip – and developed what is known as multicore architecture.

As a result, software developers have been forced to parallelise their code, otherwise only one core would be used to run a sequential program, and it would execute more slowly since the clock frequency has been reduced. Moreover, simply parallelising the code is not enough; it is necessary to balance the charge on each core, and to make the program scalable so that it automatically adapts to the number of cores available. Such parallel programming is key to taking full advantage of multicore architectures.

Combining complementary interests

The EUREKA project arose out of presentations on complementary targets in HPC by major French computer manufacturer Bull and the High Performance Computing Centre Stuttgart *(HLRS)* at the University of Stuttgart in Germany during the ITEA project outline days in spring 2006. The two organisations decided on a common project involving other partners from France, Germany, United Kingdom and Spain.
A major problem was that existing parallel programming methods and tools were not able to cope with a high number of tasks or thread. The techniques available were diverse, could not be easily combined and only applied to main parallel programming techniques and on a limited number of platforms. Moreover, HPC applications developers had little experience of parallelisation in terms of how to restructure code and organise the data. And embedded software developers knew very little about multicore architectures.
"The role of each partner was crystal clear from the beginning," explains Jean-Marc Morel of project leader Bull – and ITEA founding company. "Getting or maintaining advanced technology in this domain is key for these actors and crucial to Europe as well for improving its competitiveness and independence. Indeed, a comprehensive, innovative, integrated and validated set of programming methods and tools to harness multi-core architecture is critical for European research as well as European industry – helping computing-intensive application developers to provide advanced modelling and simulation capabilities."
Improved tools and performance
Key results included the development of mature debugging and performance analysis tools and their integration in a single package that is freely available. ParMA also dramatically improved the performances of more than 12 industrial HPC applications. And the project resulted in superior HPC platforms.
Other benefits included

- The HPC research laboratories worked closely together and unified their tools in a single package that has been presented in major HPC conferences – and they are continuing to co-operate in several new projects, guaranteeing continued support and evolution for tools users;
- The applications developers have learned how to restructure and optimise code for multicore use and have obtained new contracts because of superior performance with their applications. These applications have also become much more versatile, running efficiently in different environments rather than demanding variants per environment;
- Platform developers have been able to maintain their market competitiveness; and
- Research laboratories have gained industrial experience which they will put to work in various ways.

Fast exploitation of results
A major outcome has been fast exploitation of results with the impact on the business of the partners already observed. The main one is customer satisfaction with the simulation software editors. An important contract has been signed for instance by RECOM because the optimisation realised with ParMA enables it to use a generic algorithm for an automatic 3D-combustion optimisation in a plant involving several billion possible combinations of parameters. A typical result has been to reduce the fuel consumption on one plant, saving some €125,000 a year and cutting annual CO_2 emissions by 16,000 tonnes.
Other simulation software editor partners – such as GNS for metal forming and crashworthiness and MAGMA for casting process simulation – have also been able to provide their customers with better capabilities in terms of performance ce, more refined simulations and more accurate models, and automatic automation. And the improved competitiveness possible with the Bullx HPC platform has enabled Bull to increase revenue substantially.
http://www.eurekanetwork.org/showsuccessstory?p_r_p_564233524_articleId=640094&p_r_p_564233524_groupId=10137

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91535&CultureCode=en

Eutrophication makes toxic cyanobacteria more toxic

06 December 2010 University of Gothenburg

This satellite image of a Nodularia bloom comes from the Swedish Meteorological and Hydrological Institute (SMHI) and is free for publication provided that the following information is provided: EOS – MODIS 2005-07-11, NASA, processed by SMHI's oceanography unit

Continued eutrophication of the Baltic Sea, combined with an ever thinner ozone layer, is favouring the toxic cyanobacterium Nodularia spumigena, reveals research from the University of Gothenburg, Sweden.
"There are several species of cyanobacteria, or blue-green algae, that can form surface blooms in the Baltic Sea," explains Malin Mohlin from the University of Gothenburg's Department of Marine Ecology.

"Which species ends up dominating a bloom depends partly on how they deal with an increased amount of UV light and a shortage of nutrients. Nodularia spumigena is most toxic when there is little nitrogen in the water but sufficient amounts of phosphorus."

As a result, wastewater treatment processes that concentrate on removing nitrogen can make cyanobacterial blooms more toxic. Wastewater therefore needs to be cleared of both nitrogen and phosphorus.
Mohlin's research shows that Nodularia spumigena can be expected to be most toxic at the beginning of a bloom in July. At that time there is generally more phosphorus than nitrogen in the water, and the cyanobacteria have not yet to float to the surface but are found deeper in the water where they have not yet been exposed to UV light.

Surface blooms of cyanobacteria, which are a type of phytoplankton, have increased in both frequency and magnitude in the Baltic Sea in recent decades, and researchers are divided on the cause. Some put it down to eutrophication – an excess of nutrients in the water – caused by human emissions of nitrogen and phosphorus

over the past 150 years. Others have studied the Baltic Sea's bottom sediment and argue that this is a natural phenomenon that has been ongoing for more than 7,000 years and is due instead to climate variations. Different species of nitrogen-fixing cyanobacteria bloom at different times. Aphanizomenon species tend to bloom from May to June, but from July to August the toxic species Nodularia spumigena normally dominates for as long as the surface water is warm and still.

The toxin it produces is called nodularin and is a hepatotoxin – a toxin that attacks the liver. Livestock and dogs around the Baltic Sea have died after consuming large quantities of toxic water during blooms.
The thesis has been successfully defended.

http://hdl.handle.net/2077/23413

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91529&CultureCode=en

New microscopic life aboard the RMS Titanic

06 December 2010 Society for General Microbiology

A brand-new bacterial species has been found aboard the RMS Titanic, which is contributing to its deterioration. The discovery reveals a potential new microbial threat to the exterior of ships and underwater metal structures such as oil rigs.
The researchers, who report their findings in the latest issue of the *International Journal of Systematic and Evolutionary Microbiology* published on 8 December, isolated the micro-organisms from a 'rusticle', collected from the RMS Titanic, 3.8 km below the ocean surface.
The novel bacterium has been named *Halomonas titanicae* by the scientists from Dalhousie University, Halifax, Canada and the University of Sevilla, Sevilla, Spain. The team also tested the rusting ability of the bacterium - and found that it was able to adhere to steel surfaces, creating knob-like mounds of corrosion products, which they will be reporting in an upcoming paper.
A similar bacterial corrosive process is thought to be responsible for the formation of the rusticles – which resemble rusty icicles – that adorn the hull of the RMS Titanic. While these appear to be solid structures, rusticles are highly porous and support a complex variety of bacteria, suggesting that *H. titanicae* may work in conjunction with other organisms to speed up the corrosion of the metal.
The RMS Titanic was made up of 50,000 tons of iron and has been progressively deteriorating for the past 98 years.. Lead researchers Dr Bhavleen Kaur and Dr Henrietta Mann, from Dalhousie University explained that the role of microbes in this process is now starting to be understood. "We believe *H. titanicae* plays a part in the recycling of iron structures at certain depths. This could be useful in the disposal of old naval and merchant ships and oil rigs that have been cleaned of toxins and oil-based products and then sunk in the deep ocean."
Dr Kaur and Dr Mann believe that the findings have opened up further areas of research that could have applications for industry. "We don't know yet whether this species arrived aboard the RMS Titanic before or after it sank. We also don't know if these bacteria cause similar damage to offshore oil and gas pipelines," they said. "Finding answers to these questions will not only better our understanding of our oceans, but may also equip us to devise coatings that can prevent similar deterioration to other metal structures."

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91472&CultureCode=en

Heart attack risk increases rapidly after rheumatoid arthritis is diagnosed

06 December 2010 Wiley - Blackwell

The risk of having a heart attack is 60 per cent higher just a year after a patient has been diagnosed with rheumatoid arthritis, according to research published in the December issue of the Journal of Internal Medicine.

Swedish researchers followed 7,469 patients diagnosed with rheumatoid arthritis (RA) between 1995 and 2006, together with 37,024 matched controls without RA to determine the risk of ischaemic heart disease, with particular reference to myocardial infarction (heart attack). The maximum follow-up was 12 years and the median was just over four years.

"Our findings emphasise the importance of monitoring a patient's heart risk from the moment they are diagnosed with rheumatoid arthritis, as the risk rises rapidly in the first few years" says lead author Marie Holmqvist from the Karolinska Institutet.

Key findings of the study included:

· Average age at diagnosis was just under 57 years and 71 per cent of the patients with RA were women. The median time from the appearance of RA symptoms to diagnosis was 6.2 months.

· 67 per cent of the patients had a positive rheumatoid factor (RF), an immunological marker found in a number of acute and chronic conditions. The difference in increased heart attack risk between the RF positive and negative subgroups was not statistically significant – 70 per cent higher in RF positive patients and 60 per cent higher in RF negative patients.

· Having RA increased the risk of any ischaemic heart disease by 50 per cent one to four years after diagnosis, staying at that level in years five to 12. The risk increased during the first year after diagnosis, but did not reach statistical significance for 12 months.

· The risk of an acute heart attack rose by 60 per cent one to four years after diagnosis, remaining at the same level in years five to 12. Again, the level increased in year one, but was not statistically significant for the first 12 months.

"Our study confirms the increased risk of heart disease and heart attacks that patients with RA face" says Marie Holmqvist. "However it also adds three important observations to previous research."

These are:

· The increased heart attack risk was apparent very soon after RA diagnosis, despite the fact that the median duration of symptoms before diagnosis was just over six months.

· Although RA has been caught earlier and treated more aggressively in the last decade, increased heart attack risks were still seen in patients diagnosed in the last five to ten years.

· Both rheumatoid factor positive and rheumatoid factor negative were associated with an increased heart attack risk.

"Our research underlines the importance of clinicians monitoring patients diagnosed with rheumatoid arthritis for an increased risk of heart problems, in particular heart attacks" concludes Marie Holmqvist. "It is also very clear that more research is needed to determine the mechanisms that link these two health conditions."

http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2796

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91454&CultureCode=en

Low-Dose Aspirin Reduces Death Rates From Range Of Cancers By Between 20 And 30 %
06 December 2010 London School of Hygiene & Tropical Medicine (LSHTM)

Benefit unrelated to dose, gender or smoking – but increases with age
The London School of Hygiene & Tropical Medicine (LSHTM) has contributed to a study showing that a low dose of aspirin reduces the occurrence of several common cancers. The study is published in today's Lancet. The work was started and carried out by Professor Peter Rothwell in Oxford, and is based on an overview of several randomised trials of aspirin. These have been primarily concerned with reducing heart attacks, but have also gathered information on deaths from cancer.
The trial contributing most information to the overview has been the Thrombosis Prevention Trial (funded jointly by the Medical Research Council and the British Heart Foundation) which was carried out by Tom Meade when he was with the Medical Research Council. Professor Meade is now Emeritus Professor of Epidemiology in LSHTM's Department of Non-Communicable Disease Epidemiology.
As well as confirming that low dose aspirin reduces large bowel cancer cases reported in another recent study also led by Professor Rothwell and to which Professor Meade contributed, it also reduces total deaths due to cancer because it affects several common individual cancers, such as those of the oesophagus (gullet), lung, stomach, pancreas and possibly the brain. Reductions in deaths are around 20-30%.
Benefit is unrelated to aspirin dose from 75mg upwards, gender or smoking habit but increases with age. Aspirin may need to be taken for at least five years before it confers benefit, probably longer for some cancers, but benefit is generally greater the longer aspirin has been taken.
Hitherto, advice about aspirin has been mainly concerned with reducing heart attacks and strokes in those who have already had them. Caution should be exercised by those who are so far free of these conditions because, unless a person's risk of them is very high, the benefit may be outweighed by the risk of serious bleeding.
Professor Meade says: 'These are very exciting and potentially important findings. They are likely to alter clinical and public health advice about low dose aspirin because the balance between benefit and bleeding has probably been altered towards using it', although Professor Meade adds that this does not mean everyone should automatically take aspirin. Health professionals and others will now have to consider the practical implications.

- **Full bibliographic information**Effect of daily aspirin on long-term risk of death due to cancer: analysis of individual patient data from randomised controlled trials

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Medieval England twice as well off as today's poorest nations

05 December 2010 Warwick, University of

New research led by economists at the University of Warwick reveals that medieval England was not only far more prosperous than previously believed, it also actually boasted an average income that would be more than double the average per capita income of the world's poorest nations today.

In a paper entitled *British Economic Growth 1270-1870* published by the University of Warwick's Centre on Competitive Advantage in the Global Economy (CAGE) the researchers find that living standards in medieval England were far above the "bare bones subsistence" experience of people in many of today's poor countries.

The figure of $400 annually (as expressed in 1990 international dollars) is commonly is used as a measure of "bare bones subsistence" and was previously believed to be the average income in England in the middle ages.

However the University of Warwick led researchers found that English per capita incomes in the late Middle Ages were actually of the order of $1,000 (again as expressed in 1990 dollars). Even on the eve of the Black Death, which first struck in 1348/49, the researchers found per capita incomes in England of more than $800 using the same 1990 dollar measure. Their estimates for other European countries also suggest late medieval living standards well above $400.

This new figure of $1,000 is not only significantly higher than previous estimates for that period in England – it also indicates that on average medieval England was better off than some of the world's poorest nations today including the following (again average annual income as expressed in 1990 dollars).

Zaire $249
Burundi $479
Niger $514
Central African Republic $536
Comoro Islands $549
Togo $606
Guinea Bissau $617
Guinea $628
Sierra Leone $686

Haiti at $686
Chad $706
Zimbabwe $779
Afghanistan $869
University of Warwick economist Professor Stephen Broadberry, who led the research said:

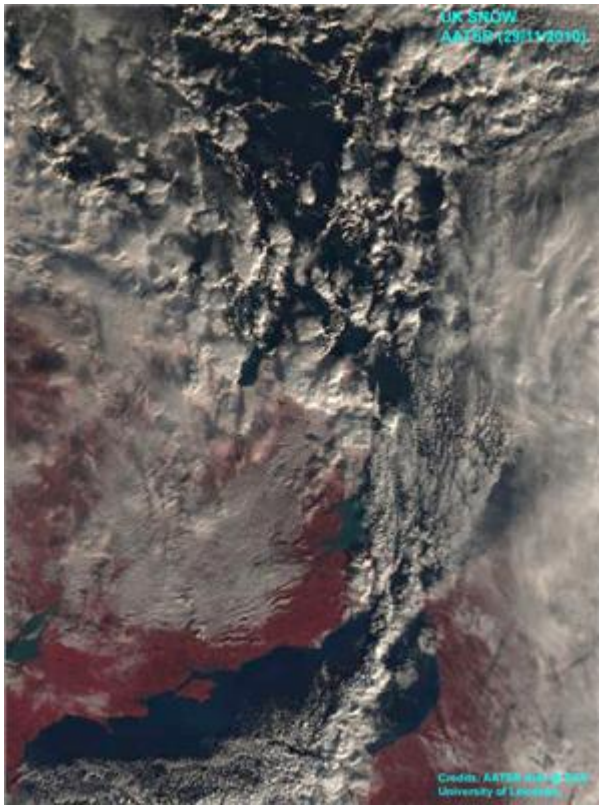
“Our work sheds new light on England’s economic past, revealing that per capita incomes in medieval England were substantially higher than the “bare bones subsistence” levels experienced by people living in poor countries in our modern world. The majority of the British population in medieval times could afford to consume what we call a “respectability basket” of consumer goods that allowed for occasional luxuries. By the late Middle Ages, the English people were in a position to afford a varied diet including meat, dairy produce and ale, as well as the less highly processed grain products that comprised the bulk of the “bare bones subsistence” diet."
He also said:
“Of course this paper focuses only on average per capita incomes. We also need to have a better understanding of the distribution of income in medieval England, as there will have been some people living at bare bones subsistence, and at times this proportion could have been quite substantial. We are now beginning research to construct social tables which will also reveal the distribution of income for some key benchmark years in that period”
"The research provides the first annual estimates of GDP for England between 1270 and 1700 and for Great Britain between 1700 and 1870. Far more data are available for the pre-1870 period than is widely realised. Britain after the Norman conquest was a literate and numerate society that generated substantial written records, many of which have survived. As a result, the research was aided by a wide variety of records – among them manorial records, tithes, farming records, and probate records."
Professor Broadberry further said that:
“Our research shows that the path to the Industrial Revolution began far earlier than commonly has been understood. A widely held view of economic history suggests that the Industrial Revolution of 1800 suddenly took off, in the wake of centuries without sustained economic growth or appreciable improvements in living standards in England from the days of the hunter-gatherer. By contrast, we find that the Industrial Revolution did not come out of the blue. Rather, it was the culmination of a long period of economic development stretching back as far as the late medieval period.”

http://www2.warwick.ac.uk/newsandevents/pressreleases/medieval_england_twice

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91442&CultureCode=en

University of Leicester releases satellite imagery of snow-bound UK

viernes, 03 de diciembre de 2010 Leicester, University of



Earth observation scientists at the University of Leicester have recorded stunning images of the UK's winter landscape by orbiting satellites. European Space Agency satellite instruments have been observing the icy blast in the UK from their vantage points in space.
Leicester scientists have used two instruments, MERIS and AATSR, which have returned stunning images of a snow-bound UK from observations on November 29th and December 1st.
In the MERIS images, the colour scale runs from white snow and clouds to green vegetation. In the AATSR images, the non-snow areas are coloured red to highlight differences to the white snow. The change in snow cover within two days is clearly visible.
The AATSR instrument has been funded in the UK by the Department for Energy and Climate Change, and is a centrepiece of a new exhibition at the Science Museum, entitled 'Atmosphere ... exploring climate science'. The exhibition was formally opened by HRH Prince Charles today, December 3rd, and will be open to the public from tomorrow (December 4th).
Professor John Remedios, Head of Earth Observation Science at the University of Leicester, said "These images demonstrate how much our local climate depends on a combination of the climate mean temperature in a given month and the meteorological variability which can produce very cold and very warm months. For the UK, it is another cold winter. At one time a few years ago our children complained that there was never any snow. Now there is plenty!"
He added "Each year we need to make careful observations in order to increase the accuracy of the weather prediction. The AATSR instrument is both very good at measurements for climate and for weather forecasting"
The AATSR instrument is flown on the European Space Agency (ESA) satellite, Envisat, launched in 2002, alongside ESA's MERIS instrument. The AATSR measures fundamental climate variables such as sea and land surface temperature, aerosols and clouds whilst the MERIS instrument is able to observe vegetation greenness and ocean colour, and their change over the seasons. The Envisat recently underwent a controlled orbit change to extend its lifetime to 2013. The images show that the instruments are working very well.

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91436&CultureCode=en

Breakthrough in dental plaque research

University of Groningen

The Groningen professors Bauke Dijkstra and Lubbert Dijkhuizen have deciphered the structure and functional mechanism of the glucansucrase enzyme that is responsible for dental plaque sticking to teeth. This knowledge will stimulate the identification of substances that inhibit the enzyme. Just add that substance to toothpaste, or even sweets, and caries will be a thing of the past. The results of the research have been published this week in the journal Proceedings of the National Academy of Sciences (PNAS).

The University of Groningen researchers analysed glucansucrase from the lactic acid bacterium *Lactobacillus reuteri*, which is present in the human mouth and digestive tract. The bacteria use the glucansucrase enzyme to convert sugar from food into long, sticky sugar chains. They use this glue to attach themselves to tooth enamel. The main cause of tooth decay, the bacterium *Streptococcus mutans*, also uses this enzyme. Once attached to tooth enamel, these bacteria ferment sugars releasing acids that dissolve the calcium in teeth. This is how caries develops.

Three dimensional structure

Using protein crystallography, the researchers were able to elucidate the three dimensional (3D) structure of the enzyme. The Groningen researchers are the first to succeed in crystallizing glucansucrase. The crystal structure has revealed that the folding mechanism of the protein is unique. The various domains of the enzyme are not formed from a single, linear amino acid chain but from two parts that assemble via a U-shaped structure of the chain; this is the first report on such a folding mechanism in the literature.

Functional mechanism

The unravelling of the 3D structure provided the researchers with detailed insight into the functional mechanism of the enzyme. The enzyme splits sucrose into fructose and glucose and then adds the glucose molecule to a growing sugar chain. Thus far the scientific community assumed that both processes were performed by different parts of the enzyme. However, the model created by the Groningen researchers has revealed that both activities occur in the same active site of the enzyme.

Inhibitors

Dijkhuizen expects that specific inhibitors for the glucansucrase enzyme may help to prevent attachment of the bacteria to the tooth enamel. Information about the structure and functional mechanism of the enzyme is crucial for developing such inhibitors. Thus far, such research has not been successful, states Dijkhuizen:

'The various inhibitors studied not only blocked the glucansucrase, but also the digestive enzyme amylase in our saliva, which is needed to degrade starch.'

Evolution

The crystal structure also provides an explanation for this double inhibition. The data published by the Groningen scientists shows that glucansucrase proteins most likely evolved from amylase enzymes that degrade starch. 'We already knew that the two enzymes were similar', says Dijkhuizen, 'but the crystal structure revealed that the active sites are virtually identical. Future inhibitors thus need to be directed towards very specific targets because both enzymes are evolutionary closely related.'

Toothpaste and sweets

Dijkhuizen points out that in future glucansucrase inhibitors may be added to toothpaste and mouthwash. 'But it may even be possible to add them to sweets', he suggests. 'An inhibitor might prevent that sugars released in the mouth cause damage.' However, Dijkhuizen doesn't expect that toothbrushes have had their day: 'it will always be necessary to clean your teeth.'

http://www.rug.nl/corporate/nieuws/archief/archief2010/persberichten/190_10?lang=en

http://www.alphagalileo.org/ViewItem.aspx?ItemId=91418&CultureCode=en