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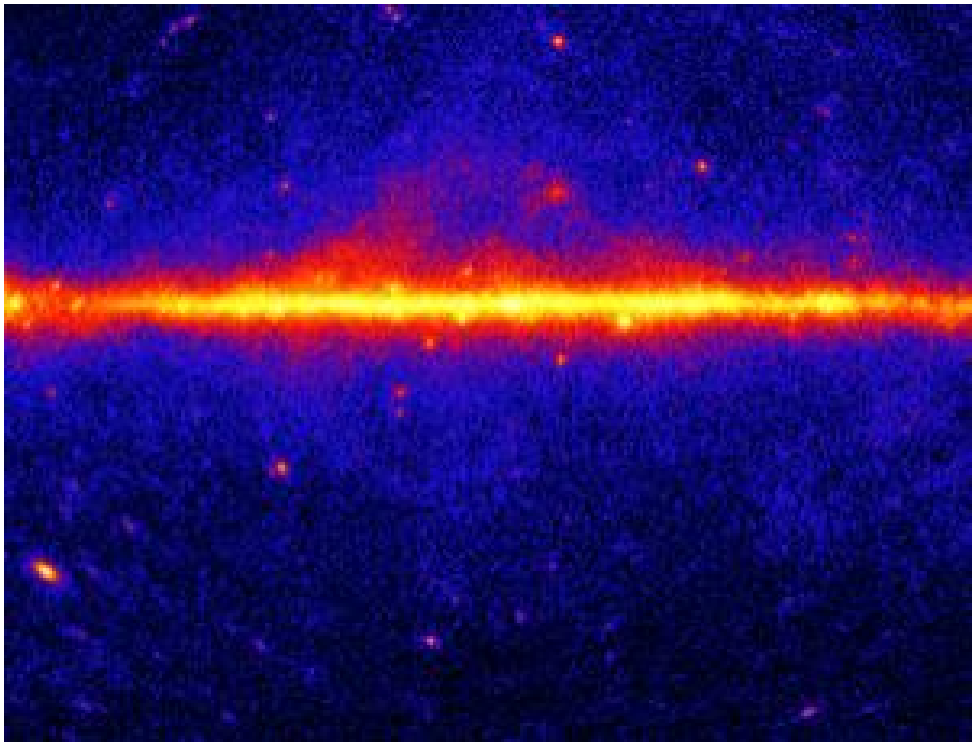
Higgs in space: Orbiting telescope could beat the LHC

- 14 December 2009 by **Anil Ananthaswamy**
- Magazine issue 2738.



Measuring gamma rays at the centre of the galaxy may point to the elusive Higgs boson (Image: NASA)

EVIDENCE for the Higgs boson could be pouring down upon us from deep space. If so, an orbiting space telescope could upstage the Large Hadron Collider in the search for the elusive particle.

NASA's FERMI satellite was launched last year to detect gamma rays. One expected source of gamma rays is the mutual annihilation of dark matter particles in our galaxy. While the nature of dark matter - which makes up 90 per cent of the matter in the universe - is unknown, physicists think it is made of weakly interacting massive particles, or WIMPs.

WIMPs appear in many theories. Tim Tait of the University of California, Irvine, and colleagues analysed WIMPs that show up in so-called Randall-Sundrum models of space-time. These models propose a fourth dimension to space that is curled up so small as to be undetectable. Gravity leaks into this extra dimension, explaining why it is orders of magnitude weaker than the other fundamental forces of nature.

The dark matter particles in such models can annihilate and produce a slew of secondary particles. Two WIMPs, each with a mass of between 50 and 200 gigaelectronvolts, can annihilate into two massless gamma-ray photons, the energy of each equalling the mass of one WIMP. Alternatively, the WIMPs can produce one photon and one massive particle.

According to the researchers, one such massive particle could be the Higgs boson - the particle thought to endow all elementary particles with mass. "If there is a strong connection between the physics of dark matter and the physics of mass generation, those dark matter particles probably like to interact with the Higgs boson," says Tait (arxiv.org/abs/0912.0004).

There might be a connection between the physics of dark matter and that of mass generation

If this was the case, a study of the sky - say in the direction of the galactic centre, where dark matter particles are supposed to be concentrated - should show gamma rays peaking at certain energies. The standard expectation of dark matter is that you'll see one single peak, says Tait. "We are predicting that there may be an entire forest."

If FERMI sees these telltale signatures anytime soon, then in theory it will have sighted the Higgs before the LHC, which is still a few years from any such discovery. "FERMI has very good prospects of discovering the Higgs if this model is true," says Tait.

The gamma-ray peaks could also be detected by ground-based gamma-ray telescopes such as VERITAS in southern Arizona or HESS in Namibia.

Dan Hooper of Fermilab in Batavia, Illinois, says the model used by Tait's team is exotic but not implausible. "FERMI is the kind of experiment you would want to use to look for this kind of signature," says Hooper. "If they got lucky, and this kind of dark matter candidate exists, then they could measure the masses of both the dark matter and the Higgs."

The FERMI telescope has already collected some gamma-ray measurements from the centre of the Milky Way but so far it has only been used to put limits on how much dark matter is out there, according to Elliott Bloom of the FERMI collaboration at the SLAC National Accelerator Laboratory in Menlo Park, California. "We are only starting to untangle what's going on."

http://www.newscientist.com/article/mg20427384.100-higgs-in-space-orbiting-telescope-could-beat-the-lhc.html

Cave 'breathing' regulates growth of stalactites

- 13 December 2009

Magazine issue 2738.

Breath to produce stalactites (Image: Stephen Alvarez/NGS)

STALACTITES are formed by the drip, drip of water, right? Not entirely. The way caves "breathe" is the true controller, a finding which pours doubt on ancient climate records derived from these structures.

Philip Froelich of Florida State University in Tallahassee and colleagues recorded air circulation in the Hollow Ridge cave near Marianna by measuring airborne radon, a naturally occurring radioactive gas. They found that levels were lowest in the winter, when cold, moist air at higher pressure rushes into the cave and flushes out stale, radon-rich air (*Earth and Planetary Science Letters*, DOI: 10.1016/j.epsl.2009.11.010).

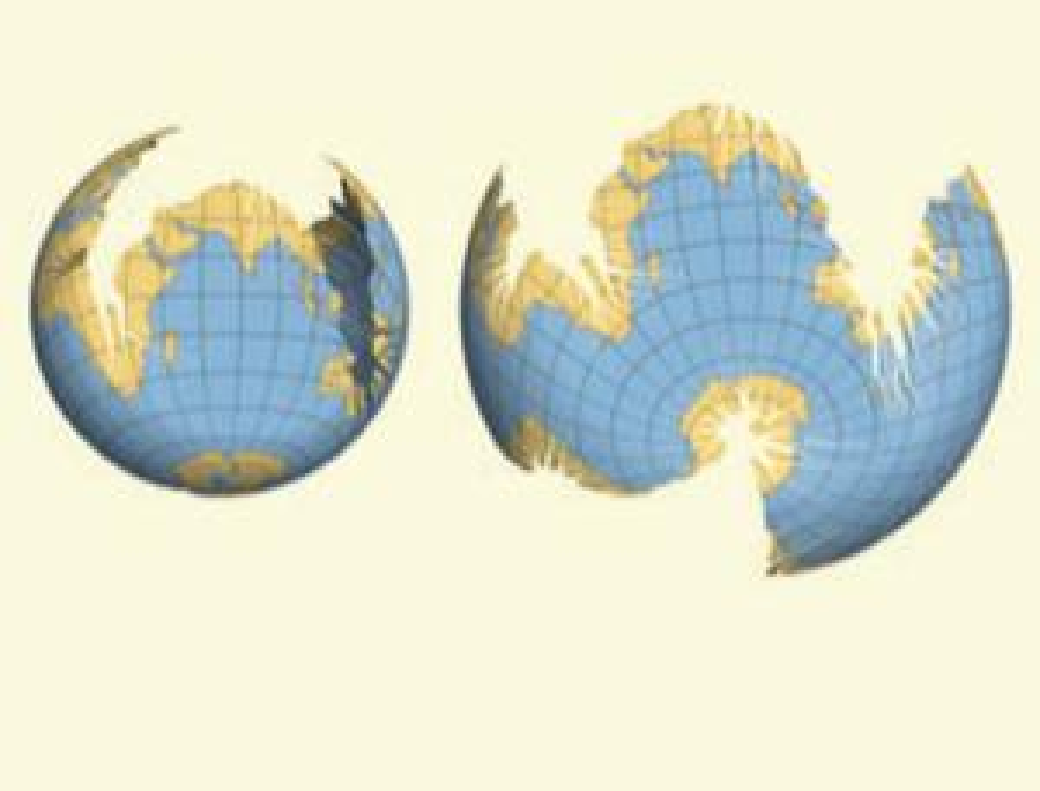
The team suggest that stagnant summer air is hindering the precipitation of calcium carbonate from groundwater. That's because carbon dioxide is given off during the reaction, and if $C0_2$ levels in the surrounding air get too high, precipitation ceases. "If caves don't breathe they don't produce stalagmites," says Froelich.

Some records of ancient rainfall may be skewed, as estimates based on stalactite formation assume year-round mineral deposition.

http://www.newscientist.com/article/mg20427385.200-cave-breathing-regulates-growth-of-stalactites.html

Clever folds in a globe give new perspectives on Earth

- 13:57 10 December 2009 by **Jacob Aron**



Unravelling the world in novel new ways (Image: J van Wijk/The Cartographic Journal/Maney Publishing)

A new technique for unpeeling the Earth's skin and displaying it on a flat surface provides a fresh perspective on geography, making it possible to create maps that string out the continents for easy comparison, or lump together the world's oceans into one huge mass of water surrounded by coastlines.

See a gallery of the new maps

"Myriahedral projection" was developed by Jack van Wijk, a computer scientist at the Eindhoven University of Technology in the Netherlands.

"The basic idea is surprisingly simple," says van Wijk. His algorithms divide the globe's surface into small polygons that are unfolded into a flat map, just as a cube can be unfolded into six squares.

Cartographers have tried this trick before; van Wijk's innovation is to up the number of polygons from just a few to thousands. He has coined the word "myriahedral" to describe it, a combination of "myriad" with "polyhedron", the name for polygonal 3D shapes.

Warping reality

The mathematical impossibility of flattening the surface of a sphere has long troubled mapmakers. "Consider peeling an orange and trying to flatten it out," says van Wijk. "The surface has to distort or crack."

Some solutions distort the size of the continents while roughly preserving their shape – the familiar Mercator projection, for instance, makes Europe and North America disproportionately large compared with Africa. Others, like the Peters projection, keep landmasses at the correct relative sizes, at the expense of warping their shapes.

An ideal map would combine the best properties of both, but that is only possible by inserting gaps into the Earth's surface, resulting in a map with confusing interruptions. Van Wijk's method makes it possible to direct those cuts in a way that minimises such confusion.

Maps of significance

When generating a map he assigns a "weighting" to each edge on the polyhedron to signal its importance, influencing the placement of the cuts or folds. All the maps are equally accurate, but tweaking the weightings gives dramatically different results.

Assigning more significance to landmass gives a map of all the continents in a line, similar to Buckminster Fuller's Dymaxion map. Making oceans more important than land produces one giant sea surrounded by the world's coastlines.

"Now and then you make an unexpected discovery," says van Wijk. A map that separates land from sea as far as possible, leaving the continents marooned away from a sinuous watery mass, was one such serendipitous result of playing with the algorithm's parameters.

Projection means prize

"His approach was fresh and innovative," says Kenneth Field, editor of the British Cartographic Society's *The Cartographic Journal*, which recently gave van Wijk the Henry Johns award, which recognises the best mapmaking research paper each year. "He managed to achieve a projection that reduces angular deformation to an absolute minimum and preserves area - not an easy trick," adds Field, "it was a unanimous decision to give him the prize."

Van Wijk attributes his success to being somewhat of an outsider. Cartographers typically seek single formulae that can be used to transform the entire globe, he says, while computer scientists look for algorithms that work in small steps and can be more adaptable.

Journal reference: *The Cartographic Journal*, DOI: 10.1179/000870408x276594

http://www.newscientist.com/article/dn18264-clever-folds-in-a-globe-give-new-perspectives-on-earth.html

Reading Practice Can Strengthen Brain 'Highways'

by Jon Hamilton

Paul Vernon/AP

Intensive reading programs can produce measurable changes in the structure of a child's brain, according to a study in the journal *Neuron.* The study found that several different programs improved the integrity of fibers that carry information from one part of the brain to another.

"That helped areas of the brain work together," says Marcel Just, director of the Center for Cognitive Brain Imaging at Carnegie Mellon University in Pittsburgh.

Coordination is important because reading involves a lot of different parts of the brain, Just says.

Some parts recognize letters, others apply knowledge about vocabulary and syntax, and still others decide what it all means. To synchronize all these operations, the brain relies on high speed "highways" that carry information back and forth, he says.

If those information highways can't handle the traffic, the brain won't be able to make sense of the text on a page or a screen. Just and his colleague Timothy Keller wondered whether that might be part of the problem for a lot of children struggling to read.

They used a special type of MRI to look at the brains of several dozen children from 8 to 12 years old, including poor readers and those with typical reading skills. The MRI scans allowed the scientists to study the network of fibers that carries information around the brain, which lives in the brain's so-called white matter.

Children with poor reading skills had white matter with "lower structural quality" than typical children, Just says.

Building Up The Brain

So during the next school year, Just and Keller enrolled some of the poor readers in programs that provided a total of 100 hours of intensive remedial instruction. The programs had the kids practice reading words and sentences over and over again.

When they were done, a second set of MRI scans showed that the training changed "not just their reading ability, but the tissues in their brain," Just says. The integrity of their white matter improved, while it was unchanged for children in standard classes.

Equally striking, Just says: "The amount of improvement in the white matter in an individual was correlated with that individual's improvement in his reading ability."

The finding adds to the evidence that learning involves more than just gray matter — the brain tissues that process and store information.

It's becoming clear that white matter is also critical for learning, says Doug Fields, a researcher in the Child Health and Human Development section at the National Institutes of Health. That realization has led to a shift in the way many scientists view the brain, Fields says.

"By analogy, we were looking at a transistor, and now we're looking at the whole network," he says.

Other studies have shown that white matter changes when people learn to juggle or play a musical instrument, Fields says.

And, he says, white matter also seems to be involved in everything from psychiatric illness to mathematical ability to autism.

"Really, the more we look, the more we find," Fields says.

http://www.npr.org/templates/story/story.php?storyId=121253104

Feel the Guilt, Save the Planet

By: Tom Jacobs

You never call.

You never write.

And to top it off, you're not doing anywhere near enough to save the environment.

Unless you're a delegate to the International Climate Change Conference in Copenhagen, you probably haven't gotten a call from your mother with that precise message. But new research suggests the emotion it is meant to elicit may prompt people to trade in that gas guzzler or get serious about recycling.

Never underestimate the effectiveness of guilt.

"I wouldn't want to overstate its power, but it's one tool we should consider if we want to motivate behavior," said social psychologist Mark Ferguson, a junior fellow with the Canadian Institute for Advanced Research. "What we've found in the research we've done so far is that people's patterns of behavior seem to be almost identical to the patterns of guilt they experience."

Ferguson's research, which has just been published in the *Journal of Environmental Psychology*, provides important information for governments, environmental organizations or anyone else grappling with the tricky issue of how to persuade people to adopt a more environmentally friendly lifestyle. He found catalytic feelings of collective guilt can be elicited, but only under certain conditions.

His work builds upon that of his co-author, Nyla Branscombe, Ferguson's doctoral supervisor at the University of Kansas. She published several papers on the notion of collective guilt and how it affects attitudes toward groups of people who have been wronged in the past.

"I wondered, what about things that are happening now or have impacts for the future?" Ferguson said. "Climate change seemed like a wonderful topic to look at through the lens of collective guilt.

"If you look in the media, stories about eco-guilt are always based on what I personally do. But you can equally feel guilt for what your group as a whole does. It's possible that might even be more potent when looking at climate-change behavior. I may think of myself as one little person (whose impact on the environment is negligible). But as a group, not only do we do a lot of harm, but we could also do a lot of good."

To explore this notion, Ferguson surveyed 79 volunteers approached in the student union of a large Midwestern university. Each read a short passage about climate change, which varied from person to person. Half of them were informed that global warming was caused by humans, while the other half were told it was a natural phenomenon.

In each of those groups, half were warned climate change would have major ramifications for humans in 50 years, including widespread flooding, drought and disease. The others were told the effects would be minor and localized. All the participants were asked whether they agreed with the information they had been presented. They then answered three questions about the extent to which they felt guilty about the greenhouse gas emissions produced by Americans.

The highest level of collective guilt was expressed by those who agreed that climate change is human-caused, but expressed the belief its effects will be relatively minor. That finding is somewhat counterintuitive, in that one might expect higher levels of guilt in those who foresee major disaster ahead.

"You might think that," Ferguson said. "But there are a number of theories that suggest if you have a situation you can't change, the emotion it elicits could be dissipated, reduced or directed somewhere else. The health-behavior people know this pretty well. Fear appeals can have a counterproductive effect." (For examples, see these studies on cigarette warnings and an ineffective anti-drug campaign.)

So it would appear that alarmist messages are a bad idea. Visions of an impending cataclysm may catch people's eye, but they seem to engender hopelessness and dull the feelings of collective guilt that can inspire action.

"In watching media coverage of climate change over the last couple of years, it seems like the message of doability has become more prominent," Ferguson noted. "I think (environmental activists) are becoming more conscious of the fact that we need to make people aware of this issue, but we also need to give them something to do."

So Al Gore was savvy in concluding his film *An Inconvenient Truth* with a message of hope. But Ferguson isn't so sure that the former vice president's other key appeal has as much power.

"At the end of Gore's movie, he says future generations will look back on us and the decisions we make. Is that framed in a way that will inspire action? We have another paper under review that tests the idea: If you think about future generations, does it make you want to do something regarding climate change? And is that a function of collective guilt?

"What we find is just thinking about future generations doesn't increase guilt much at all. The key is thinking about future generations as a part of us, a part of our group."

In an experiment, Ferguson asked one group of people to think about the ways in which Americans living 50 years from now will be just like Americans today. Those in another group were asked to think about Americans of the future as different from ourselves.

"When you get them to think about future Americans as similar, people are more willing to do these climate-change behaviors," he found. "The key is getting people to identify with members of future generations. People who think about future folks as similar to themselves are more likely to feel guilt about what their group has done and to want to do things to change it."

Without that sort of priming, is looking ahead 50 or 100 years too abstract a notion for people to become emotionally involved? "Some people would say that," Ferguson replied. "My feeling is you can think about the future in a lot of different ways. If you think about your grandchildren and envision them having a better life, with great new technology, then you might be less willing to change your behavior. Why bother? It's all going to be good. But if you start thinking differently about the future, it could have an impact."

So Ferguson's research suggests collective guilt can inspire action, but only if people feel reasonably hopeful that things can get better. And appeals to consider the well-being of future generations can be effective, but only if they are framed in such a way that people personally identify with the generations to come. But then, every mother knows guilt is effective only under certain circumstances. Why shouldn't that truism also apply to Mother Earth?

http://www.miller-mccune.com/science_environment/feel-the-guilt-save-the-planet-1675?utm_source=Newsletter87&utm_medium=email&utm_content=1215&utm_campaign=newsletters

Cooling the Asphalt Jungle

By: Enrique Gili

The asphalt jungle is due for a makeover as tar beach becomes a sanctuary for native plants, wildflowers and winged pollinators. Like mushrooms after a spring rain, "green roofs" are proliferating on rooftops across the United States and throughout Europe, gaining adherents among sustainable design advocates intent on creating more livable and greener cities.

While rooftop gardens have been a part of city life since the 19th century (if not earlier), their environmental benefits are just beginning to be fully realized. As global temperatures creep upwards, scientists are glancing at the skyline, looking for ways to cool down concrete-bound cities and the planet. One proposal has been to install white roofs, which would reflect solar heat and require less energy to cool urban areas. Another idea is to absorb — or sequester — heat-trapping gases like carbon dioxide by using rooftops as yards.

In a first-of-its-kind study, researchers at Michigan State University have calculated the carbon sequestration benefits extensive green roofs can provide. Findings from horticulturalists Kristen Getter and Brad Rowe in October's Environmental Science & Technology revealed green roofs' potential as carbon sinks.

During photosynthesis, plants remove carbon dioxide from the atmosphere and store CO_2 in the leaves, soil and root system, converting sunshine into carbon-based compounds such as carbohydrates and sugar. According to Environmental Protection Agency statistics, U.S. forests sequestered 637 million metric tons of the carbon dioxide emitted by made-sources such as coal, fuel and natural gas. Urban forests sequestered on average an additional 74 million metric tons. (All told, the U.S. offsets about an eighth of the carbon it produces, and the vast majority of the offset comes from forests.)

Currently the job of large-scale carbon sequestration is performed in the vast storehouse of the Earth's ocean and forest ecosystems that play an integral part in regulation of the temperature of the atmosphere.

While there have been studies on how much heat green roofs might fend off, how well a green roof would store carbon had been uncertain up until Getter and Rowe's study.

Two experiments were run to measure the potential of storing carbon in green roofs. The first involved eight green roofs in Michigan and four in Maryland ranging from 1 to 6 years of age. The second involved planting an extensive green roof of 20 1-square-meter plots at MSU's campus in East Lansing.

All the green roofs were planted with Sedum, a genus of leafy succulent known for its hardiness and often used as ground cover. "We planted what we knew would grow," said Getter.

Over a two-year period, the plants on the East Lansing campus were periodically harvested. Leafy parts stored on average 168 grams of carbon per square meter, the roots and the soil respectively stored 160 and 300 grams on average. Combined, each plot had the capacity to store 375 grams of $C0_2$ per square meter.

The researchers estimated the city of Detroit has 219 acres of roof space available for conversion. If black tar roofs were retrofitted, 55,000 tons of CO_2 could be removed from the air — enough CO_2 to offset the carbon emissions of 10,000 mid-sized SUVs or trucks for an entire year, they calculated."Implementing a green roof strategy would definitely be one way of managing the sequestration of carbon," said Getter. And yet ... in order to offset man-made carbon emissions it would require a Texas-sized green roof to make a significant contribution to carbon sequestration.

"Green roofs certainly don't store the kind of carbon that a forest or productive grassland stores, but a traditional roof is essentially a wasteland — no carbon storage whatsoever," Getter wrote via e-mail.Jim Mumford, a horticulturalist turned entrepreneur, is dubious about the amount of carbon sequestration a green roof provides. Perceiving it as an added but minor benefit, "it's debatable about how much of a carbon sink it really is," he said.

Still, he's in total agreement there has to be more green and less tar on city rooftops. In 2007, he retrofitted his office with a 478-square-meter green roof, the first of its kind in San Diego, if not the state.

As the founder of GreenScaped Building, he's completed construction on nine green roofs in San Diego County and has several more projects under proposal throughout California and the United States.

Instead of talking meters and grams, Mumford is faced with the challenge of turning data into a business plan. He believes retrofitting commercial space with green roofs in Southern California is cost-prohibitive, especially in the current business climate. For the time being, "building has ground to a halt," he said.Once the market revives, the next challenge he faces will be building large-scale green roofs at a price real estate developers and building owners will pay. Green roofs cost typically twice as much to install as conventional roofs.

Nonetheless, he's intrigued. "The more I looked at it the more excited I got," he said. Mumford envisions a day when installing a green roof will be part of a comprehensive plan to create buildings that are both energy efficient and conserve water.He's assembled living walls and demonstrated water-caching systems on the grounds of his business complex, transforming his workplace into an "open laboratory" for water and energy conservation strategies, and seeking cost-effective ways to capture rainwater rather than rely on drinking water to irrigate green roofs.

Burnishing a building with a living skin has several environmental advantages. Most notably, it cuts down on storm water runoff, reducing the energy costs associated with heating and cooling buildings, and extends the material lifespan of roofs exposed to the elements.Inside his office, Mumford has noticed a marked difference. White noise has been reduced. He's saved 23 percent on his electric bills. And rather than redoing his roof every 10 to 20 years, he believes his green roof can last up to 60 years if maintained properly.

A study by the Berkeley Lawrence Lab found that if 15 percent of the buildings in Los Angeles installed reflective or green roofs, daytime temperatures would be reduced by 3 degrees Celsius — saving Los Angeles half to 1 gigawatt of power during peak-use hours. "There is a tremendous movement in other cities," said Mumford as he rattled off the names of cities where interest in green roofs has grown exponentially. That has to be good news for keeping cities cooler and green-thumbed entrepreneurs.

http://www.miller-mccune.com/science_environment/cooling-the-asphalt-jungle-1671?utm_source=Newsletter87&utm_medium=email&utm_content=1215&utm_campaign=newsletters

Battle for climate data approaches tipping point

- 16 December 2009 by **Fred Pearce**

Magazine issue 2739.

Climate measurements don't come easy (Image: British Antarctic Survey/SPL)

IGNORE the unwarranted claims that hacked emails from the University of East Anglia (UEA) in the UK expose human-made climate change as a conspiracy. Away from those headlines, an equally intense battle is taking place over access to the data showing global warming is real.

It reached a peak earlier this year, when the UEA's Climatic Research Unit (CRU) turned down freedom of information (FOI) requests for its temperature records. Last week, the UK's Met Office attempted to quell the growing anger at its lack of openness by "releasing" data from 1700 weather stations around the world. The move was a token gesture. The Met Office has admitted to *New Scientist* that those figures were already publicly available through the World Meteorological Organization.

Much data remains under lock and key. It is tied up in confidentiality agreements with the governments that provided it. The Met Office and the UK government say they are now seeking permission to publish it. What they have not yet publicly revealed is that under a confidentiality agreement between the Met Office and the UK's Natural Environment Research Council, a portion of the UK's own temperature measurements is only made available to "bona fide academic researchers working on agreed NERC-endorsed scientific programmes". Why? So that the data can be sold privately. "We have to offset our costs for the benefit of the taxpayer, so we balance that against freedom of access," says David Britton, a spokesman for the Met Office.

Government agencies are not alone in seeking to defend their hard-earned data against prying eyes. The hacked CRU emails reveal years of correspondence between a handful of climate scientists on how to respond to a growing number of FOI requests (see "Declare or defend?"). Many came from Canadian mathematician Steve McIntyre.

In 2003, after a career trading shares in mining companies, McIntyre started taking an interest in climate change. He began by asking climate historian Michael Mann, now at Penn State University in University Park, for the 1000 years' worth of data behind his famous "hockey stick" graph, which shows that the warming in the 20th century is unprecedented. After eventually obtaining most of Mann's data - much of which originally came from Keith Briffa at the CRU - McIntyre turned his attention to other CRU data sets, notably an archive of global temperatures assembled from 150 years of thermometer records by CRU director, Phil Jones.

Through 2008, as the FOI data demands escalated, so did frustration among the climate scientists. In one email, Ben Santer, a CRU alumnus now at the Lawrence Livermore National Laboratory in California, wrote: "I believe that our community should no longer tolerate the behaviour of Mr McIntyre and his cronies." Others disagreed, including former CRU director Tom Wigley, who urged Santer to be open with his data. "The benefits to the community would be truly immense," he wrote in December 2008. Jones, however, clearly felt under attack. When *New Scientist* contacted him about the data wars in July this year, he said: "McIntyre has no interest in deriving his own global temperature series. He just wants to pick holes in those that do. I'm getting pretty fed up with this. It is just time-wasting."

At stake here is the principle that scientific findings are only valid if they can be replicated - which in turn requires sharing data. And not just with friends. McIntyre told *New Scientist*: "There is an unseemliness about scientists willingly providing data to their friends and resisting the provision of data to people who are perceived as critics."

Judith Curry, an atmospheric scientist at the Georgia Institute of Technology in Atlanta, agrees that ignoring sceptics is inappropriate. "Einstein didn't start his career at Princeton, but at a post office," she says. "Scientists claim they would never get any research done if they had to continuously respond to sceptics. The counter to that argument is to make all of your data, meta-data and code, openly available. Doing this would keep molehills from growing into mountains."

Make all of your data openly available, to keep molehills from growing into mountains

Mann seems to have taken this advice of late. "He has made a concerted effort to place his materials online," says McIntyre. Like other recent battles over official databases - from paedophile registers to school league tables - it seems those demanding the freedom of information are winning the war over climate data.

Declare or defend?

A telling email episode in April 2007 shows how interactions between scientists and their critics spun out of control because the scientists mistook their critics for wreckers with no rights to data, while the critics took an aversion to scrutiny as a sign of fraud.

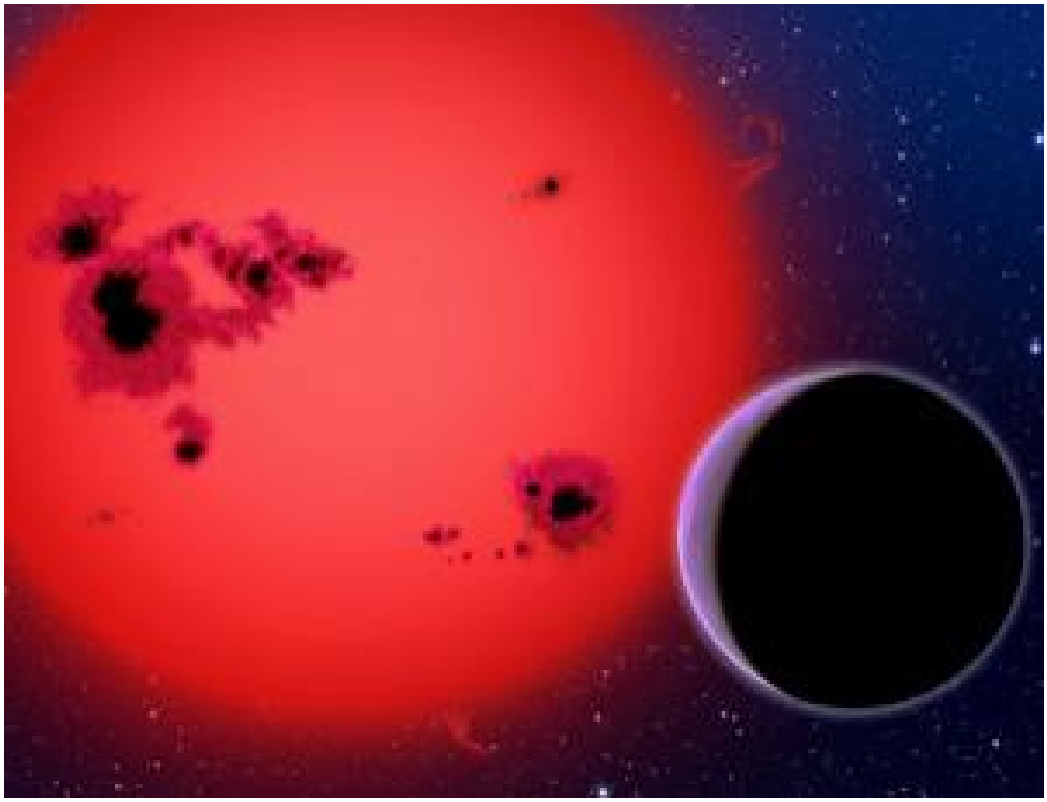
In the exchanges, Michael Mann of Penn State University in University Park, Phil Jones, the director of the UK's Climatic Research Unit (CRU), and Kevin Trenberth of the National Center for Atmospheric Research in Boulder, Colorado, discuss freedom of information requests from Douglas Keenan, a financial statistician turned independent scientist, for the location of Chinese temperature readings used in a paper co-authored by Jones 17 years before. Mann advised: "This crowd of charlatans... look for one little thing they can say is wrong, and thus generalize that the science is entirely compromised... Best thing is to ignore them completely." Trenberth disagreed: "I don't think you can ignore it. The response should try to somehow label these guys [as] lazy and incompetent."

Keenan won his FOI request and said it showed the data was flawed, because some of the stations had been moved by the Chinese scientists who ran them. He said Jones's reluctance to share the data was evidence of fraud. Tom Wigley, director of the CRU when the original paper was published, emailed Jones saying it would have been easier to admit the data's shortcomings. "Why, why, why did you not simply say this right at the start?"

http://www.newscientist.com/article/mg20427393.600-battle-for-climate-data-approaches-tipping-point.html?full=true&print=true

Alien planet could be ultimate water world

- 16 December 2009 by **Ivan Semeniuk**
- Magazine issue 2739.



This artist's conception shows the newly discovered super-Earth GJ 1214b, which orbits a red dwarf star 40 light years from Earth. It was discovered by the MEarth project - a small fleet of ground-based telescopes no larger than those many amateur astronomers have in their backyards (Image: David A. Aguilar, CfA)

A PLANET orbiting a nearby star is the best candidate yet for an alien world made almost entirely of liquid water. The discovery suggest that "super-Earths" are a much more diverse bunch than we suspected.

Super-Earths weigh up to 10 times as much as our planet. They may be among the most common types of planet in the Milky Way, and some could turn out to be cosy places for life. Around a dozen have been found, but for the most part, astronomers have been unable to pin down their properties because they don't pass in front of, or transit, their host stars as seen from Earth. Transits reveal a planet's size, allowing its density and composition to be inferred.

Earlier this year, the CoRoT spacecraft found the first transiting super-Earth, called CoRoT-7b. Broiled by its host star, the planet may be a rocky body covered in pools of lava on the side that always faces the star.

Now, astronomers have found the second transiting super-Earth around a nearby red dwarf. Called GJ 1214b, it is about 19 times as large as Earth by volume but only 6.6 times as massive. Such an object could be composed primarily of water - likely in liquid form - with a modest amount of rocky material at

its core. Calculations show it must also have an atmosphere (see diagram). Its proximity to the red dwarf, however, makes it slightly too hot to be habitable (*Nature*, DOI: 10.1038/nature08679).

The differences between the two planets suggest that super-Earths form in many different ways, says David Charbonneau of Harvard University, who led the team that discovered GJ 1214b. If it is a water world, "it could be the first clear example of a whole new population of exoplanets", says Sara Seager of the Massachusetts Institute of Technology.

Theoretical models by Seager and student Leslie Rogers show that such a planet could form if it began life much farther from its star. The lower temperatures there would have led to an ice-rock composition similar to Jupiter's moon Ganymede. Later, as the planet shifted into a tighter orbit, it would become a water world with a steamy atmosphere. Other possibilities include a small rocky planet with an implausibly vast atmosphere possibly replenished by volcanic activity.

Charbonneau has applied to use the Hubble Space Telescope to measure the composition of the planet's atmosphere, which could help rule out one or more of the models. "The presence of an atmosphere is our best chance to find out more about this object," he says.

http://www.newscientist.com/article/mg20427394.000-earthmass-alien-planet-could-be-ultimate-water-world.html?DCMP=NLC-nletter&nsref=mg20427394.000

LCD screen can recognise what happens in front of it

- 13:08 15 December 2009 by **Colin Barras**

An everyday LCD screen has been modified to "see" the world in front of it in 3D. That means a viewer can control on-screen objects by waving their arms in the air without touching the screen, let alone a mouse or keyboard.

"This is a level of interaction that nobody's ever been able to do before," says Ramesh Raskar at the Massachusetts Institute of Technology Media Lab, who created the prototype shown in the video above with colleagues Matthew Hirsch and Henry Holtzman, as well as Douglas Lanman at Brown University in Providence, Rhode Island.

The screen – dubbed BiDi, short for bi-directional – allows users to manipulate or interact with objects on the screen in three dimensions. It will also function as a 3D scanner, he adds. "If you spin an object in front of screen, the software will stitch together a 3D image."

Sharper focus

Raskar and Holtzman's team were inspired by the way manufacturers of LCD panels, including Sharp and Planar Systems, are experimenting with adding optical sensors between a panel's pixels so that it can act as a touch-screen interface.

But such displays have poor vision, like a camera with no lens, says Lanman: they can clearly image objects that are in direct contact with the screen, but anything further away is blurred. The researchers set out to modify the concept to let the screen see the world in front of it more sharply.

Placing a tiny lens slightly in front of each sensor would do that, but the layer of lenses would adversely affect the images produced by the display. Instead, Raskar and Holtzman's team used a standard 20-inch screen to show how a basic feature of all LCD screens can perform the job of a lens array.

Pinhole pixels

The brightness of each of an LCD's pixels is controlled by a layer of liquid crystals, which can swivel to physically control how much light passes from the display's backlight. In BiDi the team use that function to control light passing in the other direction onto an array of sensors behind the display.

When the screen is "looking" around it, most of its pixels are shut off by the liquid crystals. But a regular grid of hundreds of pixels spread across the screen use their liquid crystals to create a tiny hole that acts as a pinhole camera lens, focusing an image of the scene in front onto a thin translucent film a few centimetres behind the LCD. Those images are detected by a camera inside BiDi, allowing the device to know what is happening before it.

The LCD screen's pixels must also do their usual job of presenting images to the user, though. They oscillate between their two tasks many times per second, too fast for the viewer to notice that while they are watching the screen, the screen is also watching them. "We take the normal LCD layer and put it to double duty," says Lanman.

Stereo imaging

Exploiting the different viewpoints of pinholes in different places on the screen makes it possible to reconstruct stereoscopic images, by taking a small amount of information from each of the pinhole

images. Several stereoscopic image pairs are produced, each sharply focussed on objects a particular distance from the screen, from which the system can calculate how far away the object is.

"We produce multiple images, each focused on a different plane in front of the screen all the way to, say, 50 centimetres away from the screen," says Lanman. "For instance, your hand will be blurred except in the one image that's at the right depth."

A further processing step singles out the sharply focussed parts of each image in the stack, creating a sharp depth map of objects within the screen's field of view that can be used to track 3D gestures in the same way a standard touch screen captures touch gestures.

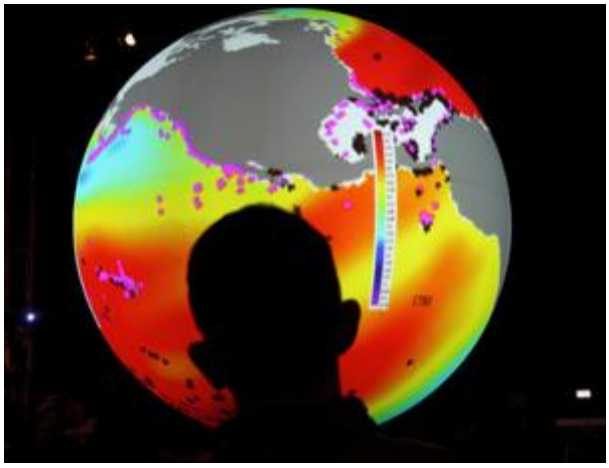
The whole process takes place in real time, and computer software interprets those gestures as an input to control the objects on the screen.

The BiDi screen will be presented at Siggraph Asia later this week.

http://www.newscientist.com/article/dn18286-lcd-screen-can-recognise-what-happens-in-front-of-it.html?DCMP=NLC-nletter&nsref=dn18286

Deniergate: Turning the tables on climate skeptics

- 15:54 14 December 2009 by **Michael Marshall** and **Michael Le Page**



Looks great: what does it mean? (Image: Miguel Villagran/Getty)

"Climategate" has put scientists on trial in the court of public opinion. If you believe climate sceptics, a huge body of evidence involving the work of tens of thousands of scientists over more than a century should be thrown out on the basis of the alleged misconduct of a handful of researchers, even though nothing in the hacked emails has been shown to undermine any of the scientific conclusions.

If we are going to judge the truth of claims on the behaviour of those making them, it seems only fair to look at the behaviour of a few of those questioning the scientific consensus. There are many similar examples we did not include. We leave readers to draw their own conclusions about who to trust.

1. Fun with the sun

In 1991, the journal *Science* published a paper by researchers Eigil Friis-Christensen and Knud Lassen, then at the Danish Meteorological Institute in Copenhagen. It included graphs that appeared to show a remarkably close correlation between solar activity and terrestrial temperatures – suggesting that other factors, such as carbon dioxide levels, have little influence on global temperatures.

The graphs were seized on by climate change sceptics and have been widely reproduced ever since. But according to Peter Laut of the Technical University of Denmark in Lyngby, the close correlations in the original graphs, and in updated versions published in 1995 and 2000, exist only because of what he describes as a "pattern of strange errors".

Laut described his findings in a peer-reviewed paper (*Journal of Atmospheric and Solar-Terrestrial Physics*, vol 65, p 801) and also wrote them up in a less technical form for the geophysicists' newspaper *Eos* (vol 85, p 370 (PDF)). His concerns about the 1991 paper are shared by a number of leading climate scientists.

Outcome: Little action has been taken following publication of Laut's papers. The 1991 paper is still frequently cited by climate deniers.

2. The great swindle

A television programme called *The Great Global Warming Swindle* was commissioned by the British broadcaster Channel 4 and aired in 2007.

The documentary, written and directed by Martin Durkin, prompted a voluminous complaint to the UK's broadcast regulator Ofcom, alleging 137 breaches of broadcasting regulations.

For instance, the programme showed a graph comparing temperature and solar activity since 1550, based on a 1995 paper by Friis-Christensen and Lassen. This was one of the graphs questioned by Peter Laut (see above).

In the original graph, there was a gap in the solar activity line between 1600 and 1700 because there were no sunspots at this time, as confirmed by sunspot records. In the TV programme, this gap had somehow been filled in. Friis-Christensen accused the programme makers of fabricating the data.

The programme was also alleged to have misrepresented the views of several scientists who were interviewed on camera.

Outcome: Ofcom upheld some complaints about scientists being misrepresented, but decided that the breaches of factual accuracy did not fall within its remit.

3. The Oregon petition

The Oregon Institute of Science and Medicine is a research centre in the small town of Cave Junction; it says it conducts research into "protein biochemistry, diagnostic medicine, nutrition, preventive medicine and ageing". In 1998, it issued a petition urging the US government to reject all limits on greenhouse gas emissions. The petition was mailed to thousands of US scientists, who were asked to sign it.

It was accompanied by an article entitled "Environmental effects of increased atmospheric carbon dioxide". One of the authors, Willie Soon, is a well-known climate sceptic. The article closely resembled the style of articles from the peer-reviewed journal *Proceedings of the National Academy of Sciences*, down to the typeface. It had not been published in that or any other journal, as the US National Academy of Sciences made clear in a statement.

Despite intense scientific criticism (see here (PDF) and here, for example) the petition attracted over 30,000 signatures – although the organisers admitted that they did little to verify the respondents' credentials, allowing obviously fake names like "Dr Geri Halliwell" to be included.

Outcome: As of 2008, the petition was being recirculated. The accompanying article has acquired an aura of respectability, having finally been published in a journal, albeit not one specialising in climatology: – the *Journal of American Physicians and Surgeons*.

4. Peer review?

In 2008, the *Forum on Physics and Society* (*FPS*), a newsletter produced by the American Physics Society, published an article entitled "Climate sensitivity reconsidered". The article claimed that "the IPCC's estimates may be excessive and unsafe" and that attempts to cut CO_2 emissions "are pointless, may be ill-conceived and could even be harmful".

The article was written by Christopher Monckton, a British journalist and consultant. Although apparently highly technical, the piece has been strongly criticised by professional climate scientists, including Gavin Schmidt, of NASA's Goddard Institute for Space Studies, New York.

The piece was reported by the US Science and Public Policy Institute as having been "peer-reviewed".

The editors of *FPS* pointed out that, as was standard practice at the journal, they had merely edited the piece without sending it out to specialist climate scientists for peer review. A disclaimer was subsequently added to the piece, clarifying that nothing in *FPS* was peer-reviewed.

Outcome: In late 2009, Monckton embarked on a tour of North America to promote his personal views on climate change.

5. No logo

The Global Warming Policy Foundation is an independent think tank chaired by the former British finance minister Nigel Lawson that claims to "bring reason, integrity and balance to a debate that has become seriously unbalanced, irrationally alarmist and all too often depressingly intolerant". So it is a little disappointing that a graph in the banner on the organisation's homepage is so misleading.

That graph is a jazzed-up graph of average global temperatures since 2001 and shows, essentially, no trend. The implication is that global temperatures are not increasing.

Of course, no conclusions can be drawn from such a short time span, because temperatures vary so much from year to year anyway. You have to look at several decades in order to pick out real trends. The UK Met Office this week published data showing that the first decade of the 2000s has been the warmest on record.

Outcome: On 3 December the British newspaper *The Independent* reported that "an error by a graphic designer" in the graph had been corrected. The larger issue of the misleadingly short time span has not been addressed.

6. David Bellamy

Readers in the UK may remember botany lecturer David Bellamy as a leading conservationist and a presenter of television programmes about the environment and biodiversity. To give some idea of his commitment to environmental issues, in 1983 he was jailed for blockading Australia's Franklin River in protest at a proposed dam.

However, Bellamy has become a prominent global warming sceptic and has made a number of notable claims in the media.

For instance, in 2005 he wrote a letter to *New Scientist* claiming that most of the world's glaciers are growing, which is manifestly not the case. In fact, around the world glaciers are melting three times as fast as they were in the 1980s.

Then last year he claimed that, as a result of increased carbon dioxide in the atmosphere, "300,000 square kilometres of former desert are now covered with trees". He cited *New Scientist* as the source for this claim, so we combed our archive to find the evidence.

Outcome: We couldn't find any article making such a claim. On the contrary, we found an alternative explanation for the greening. Bellamy has never contacted us to acknowledge the error with the glaciers or to point us to the source of the claim for the greening of the desert.

7. Astroturfing

It's not just a kind of artificial grass: the word astroturfing also refers to a form of propaganda.

Organisations promoting a particular viewpoint set about creating an artificial "grassroots" movement, which appears to be spontaneous but is in fact carefully planned by the organisation.

Earlier this year, the US House of Representatives select committee on energy independence and global warming received a number of letters opposing the American Clean Energy and Security Act, which would set limits on the country's greenhouse gas emissions. The letters were purportedly from members of the public.

However, it then emerged that the letters were an example of astroturfing: several of them had been faked.

Outcome: At a hearing of the House select committee, the president of US lobbying firm Bonner and Associates apologised. The fake letters were apparently created by a temporary employee.

8. Cosmic correlations

According to Henrik Svensmark, a physicist at the Danish National Space Center in Copenhagen, cosmic rays have a major affect on the Earth's climate. He says that fewer cosmic rays mean fewer clouds, warming the Earth.

In 1997, Svensmark claimed there was a correlation between cosmic ray intensity and satellite measurements of total cloud cover since the 1980s. This apparent correlation depends on adjustments to the data, however, and it does not hold up (PDF) when more recent cloud measurements from 1996 onwards are included.

Svensmark has also pointed to an apparent correlation between low-altitude cloud cover and cosmic rays. But after 1995, the fit of Svensmark's graph depends on a "correction" of satellite data, and the satellite scientists say this is not justified. "It's dubious manipulation of data in order to suit his hypothesis," says Joanna Haigh, an atmospheric physicist at Imperial College London. Svensmark does not accept this.

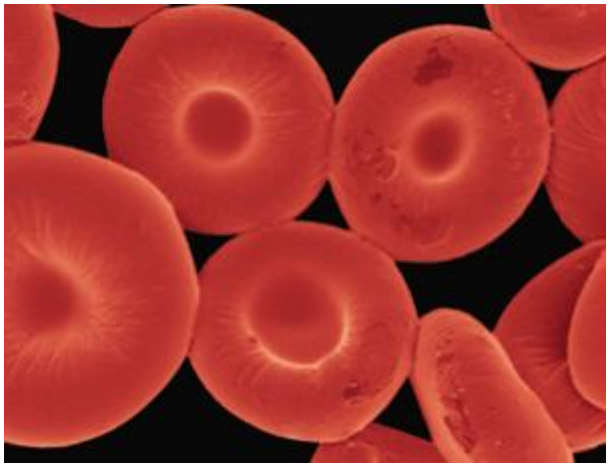
Recent independent studies suggest cosmic rays can affect cloudiness, but not in the way Svensmark claims, and that their effect on climate is insignificant. Direct satellite measurements rule them out as an explanation for the recent warming.

Outcome: Svensmark wrote a book about his ideas, *The Chilling Stars*, co-authored by Nigel Calder, editor of *New Scientist* from 1962 to 1966. Despite the lack of scientific support, his claims remain popular with climate deniers. Svensmark claims the world is cooling. Well, let's see.

http://www.newscientist.com/article/dn18279-deniergate-turning-the-tables-on-climate-sceptics.html?DCMP=NLC-nletter&nsref=dn18279

Fake blood cells so agile they can carry drugs

- 20:00 14 December 2009 by **Jessica Hamzelou**



The replica red blood cells look just like the real deal (Image: Nishit Doshi)

1 more image

You can't get blood from a stone, but it seems you can make imitation red blood cells from polymers.

Just like real blood cells the pretenders can squeeze through spaces much smaller than their own diameter and absorb and release substances to order, including oxygen.

They could be used to disperse drugs, or the contrast agents used in medical imaging, throughout the body with fewer side effects than direct injection.

The fake cells could also be given to people who have lost blood instead of a blood transfusion.

Biodegradable tyre

Real red blood cells owe their astonishing agility to their "biconcave" or tyre-like shape. To create synthetic particles with the same agility, Samir Mitragotri of the University of California and his team got their inspiration from the way real red blood cells acquire their final shape in the body.

They start out as spherical cells which then collapse into mature red blood cells following exposure to various substances. Similarly, Mitragotri's team found that if they added small balls made of a polymer called PLGA to a particular solvent, the spheres would collapse into a biconcave shape.

The researchers coated these 7-micrometre across, tyre-shaped particles, in a layer of protein. When they dissolved away the polymer core, a soft biodegradable protein shell was left behind with the same mechanical properties as red blood cells.

Oxygen carriers

"The soft protein shell makes them squishy and elastic," says Mitragotri. "They can squeeze through capillaries smaller than their own diameter, just like real blood cells."

The fake cells also seem to share red blood cells' ability to transport substances. One of the proteins Mitragotri added to the surface of the imitation blood cells was haemoglobin, the molecule that binds to oxygen in the lungs, later releasing it elsewhere in the body.

In test tube experiments, the researchers found that their haemoglobin-coated particles picked up oxygen when there was a lot around and released it later when the concentration was lower. If the squishy particles do the same thing when injected in animals, they could be given to people instead of a blood transfusion.

To see if the protein shells could also carry drugs, Mitragotri's team exposed them to the anti-clotting drug heparin. Sure enough, the particles soaked up the heparin and then released it later on when they were moved to an area of lower concentration.

Drug delivery

Mitragotri reckons that the particles could provide a way to get drugs into the body at a more constant concentration, or substances such as iron oxide nanoparticles, which increase contrast in magnetic resonance imaging.

When agents are injected directly, the concentration tends to be highest at the site of injection – dropping in concentration the further away they get. This scenario isn't ideal as it can cause an adverse reaction at the injection site, and lead to a shortage of the drug elsewhere.

The team also created mimics of the misshapen, crescent-like blood cells that people with sickle cell disease produce. "We could study them to understand how diseased cells flow in the bloodstream, which is currently quite difficult to do," says Mitragotri.

Elastic shape

It's not the first attempt at artificial red blood cells, but these are the only ones so far to have the shape and elasticity of real cells, says Mitragotri.

Joseph DeSimone, who developed fake blood cells last year, calls the new research "exciting". "All in all, this is great progress in tackling an important problem," he says.

Next the team want to look at exactly how the particles behave in an animal, particularly whether they circulate in the same way as their natural counterparts.

Journal reference: *Proceedings of the National Academy of Sciences*, DOI: 10.1073_pnas.0907127106

http://www.newscientist.com/article/dn18278-fake-blood-cells-so-agile-they-can-carry-drugs.html?DCMP=NLC-nletter&nsref=dn18278

Small fingers give women a sensitive touch

- 22:00 15 December 2009 by **Andy Coghlan**

Smaller is better (Image: Lauri Rotko/Getty)

Women have a more sensitive touch than men, but not because of their gender. It's just that their fingers tend to be smaller.

"We now understand that this sex difference is not actually a 'sex effect', but rather an effect of finger size," says Daniel Goldreich of McMaster University in Ontario, Canada.

His team measured the surface areas of index fingers in 100 students and then asked them to feel surfaces marked with progressively finer grooves.

Dense receptors

When the grooves get too narrow for someone's sense of touch, the surface feels smooth. On average, men could detect grooves down to 1.59 millimetres wide, whereas women detected grooves at 1.41 millimetres.

But what mattered was finger size, not gender. Spatial discrimination fell by 0.25 millimetres for every square-centimetre increase in finger area.

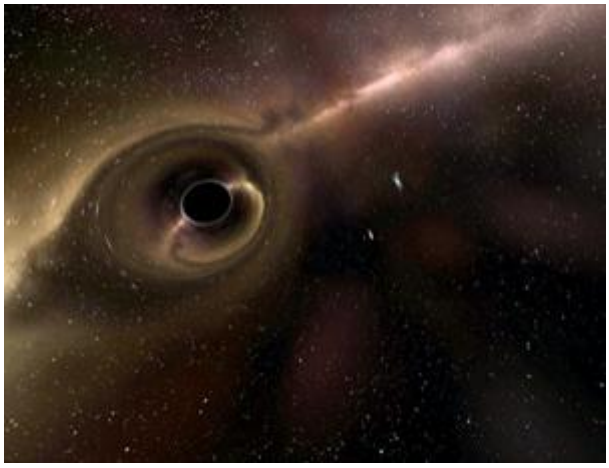
The team found that sweat pores become more densely packed as finger size decreases. They suspect that the skin's touch receptors, or Merkel cells, are also more tightly packed, which might explain why small fingers are more sensitive.

Journal reference: *The Journal of Neuroscience*, DOI: 10.1523/jneurosci.3684-09.2009

http://www.newscientist.com/article/dn18292-small-fingers-give-women-a-sensitive-touch.html?DCMP=NLC-nletter&nsref=dn18292

Baby black holes implicated in universe's mightiest rays

- 13:22 15 December 2009 by **David Shiga**



Baby black holes occur when two types of dead star merge (Image: Denver Museum of Nature & Science)

Baby black holes are puny compared with their humongous cousins at the centres of galaxies, but their birth may spew out the universe's mightiest particles.

Subatomic particles are routinely detected smashing into Earth's atmosphere at incredibly high energies, but the origin of these ultra-high-energy cosmic rays (UHECRs) remains a mystery. Some have argued that energy released by the collapse of a massive single star to form a black hole might produce the UHECRs, but the rate of such events is too low.

Todd Thompson at Ohio State University in Columbus and his colleagues argue that UHECRs may instead originate in the merger of two types of dead star, which gives birth to a black hole. They base this conclusion on the discovery of a system destined for such a merger by a team led by Carles Badenes of Princeton University. Badenes's team examined archival observations and found a white dwarf and neutron star orbiting one another extremely closely. They are spiralling toward each other, and should merge to form a black hole within 500 million years.

Thompson and colleagues point out that Badenes's team probed only a tiny fraction of the galaxy before finding this system, suggesting such doomed pairs are abundant. These collision events should be about 100 times more common than collapses of individual stars, the team calculates (arxiv.org/0912.0009).

"These objects are certainly very interesting," says Miguel Mostafá of Colorado State University, Fort Collins, who is not a member of either team, but he cautions that the rate of mergers is still highly uncertain.

Journal reference: Badenes et al, arxiv.org/0910.2709, Thompson et al, arxiv.org/0912.0009

http://www.newscientist.com/article/dn18287-baby-black-holes-implicated-in-universes-mightiest-rays.html?DCMP=NLC-nletter&nsref=dn18287

Flexible solar cell implant could restore vision

- 12:31 14 December 2009 by **Colin Barras**

Macular degeneration occurs in the central section of the retina (Image: Argentum/SPL)

The first flexible retinal implant could restore some vision to people with certain forms of visual impairment.

Conditions such as age-related macular degeneration occur when some of the photoreceptors in the eye stop functioning properly. But as other parts of the eye still work, it should be possible to restore vision using an implant that mimics the photoreceptor layer, says Rostam Dinyari at Stanford University in California.

To achieve this, an implant needs to convert a light signal into an electrical pulse – in other words, perform like a solar cell.

But most solar cells are rigid, which makes them far from ideal for use inside the eye. "If you have a lens, the focal plane is always curved and the best picture forms on a spherical surface," Dinyari says. This is why the retina is curved.

Rigid implants

Using rigid chips, a large number of small implants must be fitted in order to approximate the curve of the retina. A flexible implant would simplify matters.

"You would need a lot of surgery to implant a large enough number [of rigid implants] to cover the retina," says Dinyari. A flexible implant "would use just one surgical procedure".

While several companies are developing rigid implants, Dinyari and colleagues have designed a flexible silicon implant. They did so by carving deep grooves into the silicon between adjacent solar cell pixels that are each just 115 micrometres across.

The implant would be inserted over the most damaged part of the retina. A glasses-mounted camera would capture video, convert it to near-infrared signals and project it directly onto the implant.

Projecting images

When hit by the light, the solar cells inject current patterns corresponding to the projected images into neural tissue, which ultimately arrive at the visual cortex via the optic nerve. Near-infrared signals are used as they do not interfere with the surrounding intact photoreceptor cells, which send signals to the brain as normal.

Initial trials using retinas extracted from pigs showed that the implant could be inserted without damaging the fragile solar cell array. The team hope to implant the device into a live pig soon, before testing it in humans.

Jason Dowling at the Australian eHealth Research Centre in Herston, Queensland, thinks the approach is interesting. "To the best of my knowledge I think this is the first implant which is shaped to the curved surface and this [approach] makes a lot of sense," he says.

Dinyari presented his work at the 2009 IEDM conference in Baltimore, Maryland, last week.

http://www.newscientist.com/article/dn18275-flexible-solar-cell-implant-could-restore-vision.html?DCMP=NLC-nletter&nsref=dn18275

Bill Bryson: Everything that happens is amazing

- 16 December 2009 by **Roger Highfield**
- Magazine issue 2739. **Subscribe** and get 4 free issues.
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Getting excited about science (Image: Rex Features)

*The award-winning writer Bill Bryson tells **Roger Highfield** why his fascination with our place in the universe led him to revisit his least favourite subject at school*

Your parents were journalists. Is that why you went into the profession?

I grew up in Iowa; both my parents wrote for *The Des Moines Register*, which is probably the best provincial paper in the US. It won a lot of Pulitzer prizes. Newspapers were the family business; that is what you did in my house. It never occurred to me to do anything else. When I went into journalism in the UK, I didn't work as a writer but as a subeditor on the production side. It was good training to become a writer.

Your travel writings are famous for focusing on eccentric detail, yet in *A Short History of Nearly Everything* you look down the other end of the telescope at grander ideas. Why did you decide to make that transition?

I never intended to be a travel writer. My first successful book was *The Lost Continent*, which described a trip back to America when I travelled around the country in my mother's old Chevrolet and noticed how it had changed. It did fairly well, so I came under pressure to keep doing the same thing. I imagine that's why Peter Mayle followed *A Year in Provence* with *Toujours Provence* and *Encore Provence*. After I'd written a few travel books, I thought: I can't keep mining this vein of humour; I cannot write another joke about disappointing landladies and bad meals. So I decided to write a book about trying to understand science, specifically about understanding our place in the universe.

It's a big change. Were you worried, given that you would be writing about scientists instead of landladies?

I was very nervous about moving into writing about science as it was so far out of my comfort zone. Plus, I had this reputation for taking the mickey out of things and being irreverent, so I didn't know how scientists would perceive me - whether they would think I was just out to make fun of them. I would have been very reluctant to be interviewed by me if I had been in their position. But when they saw that I was

genuinely curious to understand what they were doing, the amount of help they gave me was tremendous. It was quite moving in a lot of ways because for many of them, particularly in a specialised field, it had been a long time since anybody had taken a real interest in what they were doing or how they ended up doing it. You could see them light up when they talked about their research.

How did you get the idea for the book?

I was looking out of an aeroplane window on a flight across the Pacific Ocean and it struck me forcefully - this is the only planet I am ever going to live on and I didn't know a thing about it.

Do you think this is because curiosity in science is stamped out in school?

Science classes are almost always taught, in my experience, as if they are trying to produce the next generation of scientists. Of course, that is a vital function. But there is no recognition that a very large proportion of people are not going to become scientists.

What always disappointed me about science lessons was how the teacher would, almost as soon as they got through the door, turn around and start writing equations on the blackboard. This meant I was quickly out of my depth; I don't have a brain that is comfortable dealing with mathematics and algebra.

In fact, there is nothing in science that isn't worth being excited about. Unfortunately, the place you are least likely to find excitement, in my view, is in schools, when that is the precise place you should be handing it out to people.

There is nothing in science that isn't worth being excited about

Tell me about the book you have just edited, *Seeing Further.*

This book is written by special people for a special audience. It has a huge number of writers - such as Margaret Atwood, who writes about the madness of mad scientists, and Steve Jones, whose contribution is on evolution and biodiversity - all people of great distinction. Describing me as an editor gives me far too much credit; I offered a few thoughts about how it should be. I am a distant uncle to the book. I don't have to be falsely modest. A lot of people worked very hard to make something that's going to be really terrific.

Whose contribution have you enjoyed the most?

Of course, I would not answer a question like that, with the exception of the contribution of Martin Rees, president of the Royal Society. They are all terrific.

Does science, being highly mathematical, deserve special care and treatment in books?

On the one hand, you don't want to make science literature too populist. It needs to be a quality presentation. But it should be enjoyed by a wider audience than just Royal Society fellows and members of the science community. How you get the balance right takes a bit of thought.

Given your experience, what is the one thing writers need to do to connect with a general audience?

The greatest danger is that you forget what amazed and excited you about your field. I was talking to a particle scientist after I had read about how electrons can go from one orbit to another without travelling across the space in between. I said, "Isn't that amazing?", and he replied, "Anything that happens in the quantum world is amazing." In fact, everything that happens anywhere is amazing if you stop and consider it.

Does writing about science make you cheerful because scientists are good at solving problems, or gloomy because there are problems you might not have known about?

Both. I was completely bowled over again and again by the genius of human beings and the things that scientists have figured out. Newton and Einstein were truly amazing human beings. But what really got me was the realisation that science is an aggregation of much smaller efforts and breakthrough moments. It is a conglomeration of little bits of knowledge that add up to something that is often magnificent. But then there are all the bad things we as a species continue to do, such as making animals go extinct. Why can we not grasp that there is just one planet that is habitable and we cannot afford to screw it up? We are so inept.

Tell me about your next book.

It's called *At Home: An informal history of private life*. I promised my wife I'd write a book where I didn't have to leave home. We live in a rectory that was built in 1851 and in the book I explore how the rooms have been lived in throughout history. The bathroom illustrates the history of hygiene; the living room, the history of comfort; and the bedroom, sex, death and sleeping. Whatever happens in the world eventually comes to your house.

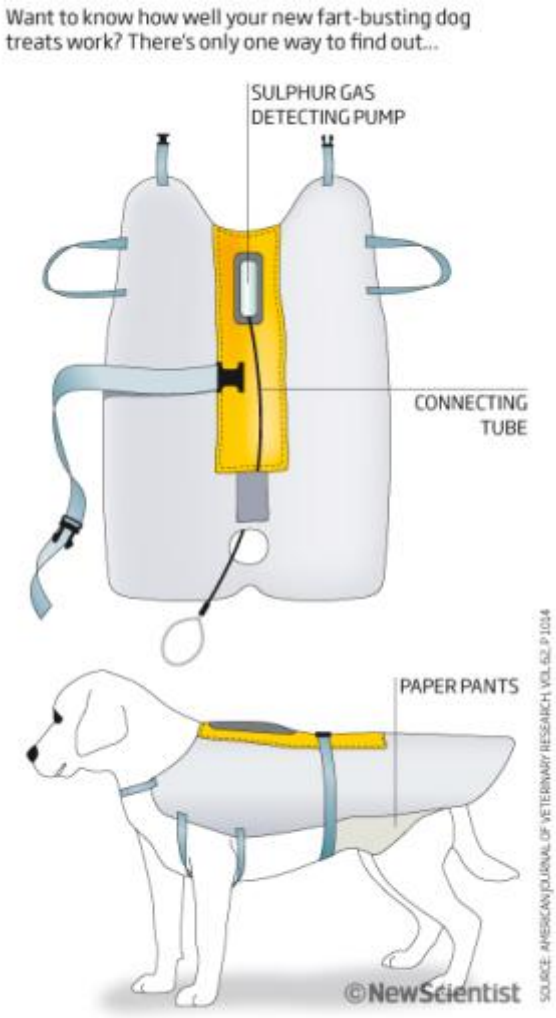
Profile

Bill Bryson was born in Des Moines, Iowa, in 1951, and has written best-selling books on travel, science and the English language. In his latest venture, *Seeing Further: The story of science and the Royal Society*, he has assembled a collection of essays by leading scientists. It will be published in January 2010 by Fourth Estate to mark the 350th anniversary of The Royal Society

http://www.newscientist.com/article/mg20427391.300-bill-bryson-everything-that-happens-is-amazing.html?DCMP=NLC-nletter&nsref=mg20427391.300

Pong-ology: Sniffing out a cure for iffy whiffs

- 16 December 2009 by **Clare Wilson**



Magazine issue 2739.

Enlarge image

MEL ROSENBERG is one of those people you might regret making small talk with at a party. "When people find out what I do for a living they tend to step away," he tells me. And no wonder: Rosenberg is a big cheese in the world of bad breath.

You can see his problem - who would want to breathe into the face of the world's top halitosis researcher? Fortunately Rosenberg is well out of sniffing range. He is based in Israel, at Tel Aviv University, and I am interviewing him by phone, trying to find out why some parts of the human body are so smelly, and what can be done about it.

Let's face it: people can pong. Even if you haven't got bad breath, your armpits probably smell from time to time, and so do your feet. And though you may not own up to it, everybody farts. Check out the

average bathroom and you'll see the amount of time, effort and money that goes into eliminating bodily odours.

But our methods can be crude. Aside from washing regularly, often all we do is daub ourselves with fragrances. "Masking", or covering up bad smells with nice ones, works OK, but these days there are more sophisticated strategies to tackle odours at source, thanks to people like Rosenberg and his fellow microbiologists.

"There are probably a few dozen compounds responsible for bad smells," says Rosenberg. "The smells are very different but they have a common origin." That source is bacteria.

The human body is teeming with microbes. By some estimates, we have 100 trillion living on us and in us. As far as they are concerned we are one gigantic buffet. Their diet ranges from the compounds in saliva and sweat to the snowstorm of dead skin cells we shed daily; from the food particles lodged in our mouths to the conveyor-belt banquet that is our digestive system.

All this bacterial feasting has the potential to create bad smells. Bacteria break down large molecules such as proteins, fats and carbohydrates into smaller ones to release energy. Where oxygen is available, the final breakdown products can be odourless carbon dioxide and water. But where oxygen is in short supply, such as in the gut or any nooks and crannies, bacteria belch out a range of organic molecules, some of which stink to high heaven.

Especially malodorous are the breakdown products of proteins. These include the nitrogen-containing molecules called amines, which tend to smell of ammonia, rotting meat and corpses: "very stinky", says Rosenberg. Proteins also contain sulphur, which can generate hydrogen sulphide, the rotten egg gas.

Smelly saliva

Rosenberg really knows his onions. He helped set up the International Society for Breath Odor Research in 1995 and is an editor-in-chief of the *Journal of Breath Research*. Despite being an establishment pillar, he takes pride in challenging what he calls the "60-year-old dogma" about the cause of bad breath.

Bacteria can be divided into two families, known for historical reasons as Gram-positive and Gram-negative. In bad breath research, the mainstream view is that Gram-negatives are the bad guys. If these bacteria are incubated in a dish of saliva they produce a "horrendous odour", Rosenberg says. A saliva soup of Gram-positive bacteria, on the other hand, smells much nicer, so they are seen as the good guys.

Rosenberg's group, however, has turned up evidence that Gram-positives may not be so squeaky clean after all. In 2002 a PhD student called Nir Sterer showed that smelly mouths tend to have high levels of the enzyme beta-galactosidase, which is made mainly by Gram-positive bacteria (*Journal of Dental Research*, vol 81, p 182).

This was puzzling because beta-galactosidase breaks down sugars, and it is proteins that make the worst smells. Rosenberg's team has an answer. Most of the proteins in saliva are glycoproteins - protein molecules with a sugar coating. His idea is that the more Gram-positive bacteria there are in your mouth breaking down the sugars, the more the underlying proteins are exposed to Gram-negatives.

The group is now developing a test kit for beta-galactosidase, called Okay To Kiss. If you want to check yourself for dragon breath, you spit on the device - preferably out of sight of the intended object of you attentions. "If it turns blue, you're not OK to kiss," Rosenberg says.

Rosenberg reckons it will go on sale in 18 months, which would cement his position as the world's number one halitosis entrepreneur. He is already responsible for a flavour used in toothpaste, and a patent tongue scraper ("minimises gagging"), to name just a few of his inventions.

He also turns out to be the brains behind Dentyl pH, a lurid two-tone mouthwash on sale in Europe, Australia and the US (where it is marketed as Blistex). Rosenberg discovered that bacteria, with their fatty coats, are best removed by an oily solution combined with a watery one. He came up with the idea of a two-phase solution that had to be shaken before use. The rest is mouthwash history.

I quiz Rosenberg further. Can't you tell if you have halitosis by huffing into your hand? Not really, he says. That's probably why an estimated 1 in 5 of us are regular sufferers. "People wander around with bad breath, even dentists. You go to a bad breath conference and some of the people there have bad breath."

A smell perhaps even more feared than bad breath is BO. While the sweat glands on most of our body secrete a watery liquid, the armpits are one of the few places that also have glands with a more milky secretion, containing lipids and proteins.

Whether or not these compounds have any function is disputed. To the bacteria on our skin, though, their role is clear: food. Microbes such as *Staphylococcus epidermidis* feast on them, releasing volatile compounds whose odours lab testers variously describe as "rancid", "cheesy" and "oniony".

Plug your sweat glands

Since the turn of the 20th century the key weapon in the fight against BO has been aluminium. Antiperspirants contain various aluminium salts that, when applied to a human armpit, form compounds that physically plug sweat glands.

Most of the research into new ways to tackle BO is done by secretive private companies, says Karl Laden, a biochemist based in Haifa, Israel, who consults for the cosmetic industry and when it comes to BO has, quite literally, written the book (*Antiperspirants and Deodorants*, published by CRC Press). The research tends to focus on combining aluminium salts with starches that release fragrances, or on better compounds for inhibiting bacteria. However, one new product from Procter & Gamble contains a doughnut-shaped molecule called beta-cyclodextrin, which is designed to trap malodorous molecules inside the ring.

Sweat is also the problem in the foot department. The soles of the feet have watery rather than milky sweat, but they make an awful lot of it. Even watery sweat contains chemicals that bacteria can feed on, mainly urea and glucose. Then there are all those dead skin cells floating around that bacteria find so appetising.

The key reason feet can get so smelly is that they are marinaded in their own perspiration. Moisture builds up inside socks and shoes, neutralising the skin's normally acidic condition and allowing bacteria to proliferate. "You give them a lovely environment to grow in if you keep them in a damp, more neutral pH," says Michelle Cullen, a podiatrist at the University of Salford, UK.

Cullen has seen some cheesy feet in her time. When bacteria get really out of control, they start eating into the soles of the feet causing a condition known as pitted keratolysis. "That really is malodorous," she winces.

That requires antibiotic treatment, but most of us can stick to Cullen's top tips for fresh-smelling feet: change shoes regularly, wear mixed cotton and polyester socks to wick sweat away, and use aluminium-based antiperspirants. "If you address the sweating then you prevent the problem," she says.

Still, even feet with pitted keratolysis are no match for the smelliest part of the human body: the bowel. "It's a fact that bacteria make things in the gut that don't smell very nice," says Glenn Gibson, a food microbiologist at the University of Reading, UK.

Gibson reveals on the phone that his lab regularly creates models of the human colon, the lower part of the intestine where all the interesting bacterial action is. Food goes in at the top, bacteria bubble away in the middle and faeces come out at the end. This I have to see. So I invite myself over.

It is sunny on the day of my visit and the Reading campus seems too nice a setting for a poo-making machine. I locate Gibson's lab in the Department of Food and Nutritional Sciences. Before he set up shop, he tells me, the air was filled with the aromas of cheese or freshly baked bread. "Now it smells of excrement," says Gibson. "The whole department complains about it."

Disappointingly, the lab smells only slightly musty on the day of my visit, as they have just one model up and running. You need several to get a good stench, says Gibson. Some days they have about 20 going at once.

With that thought I am led to the model. As poo machines go, it is a magnificent creation. A vessel on the top shelf holds a mixture of semi-digested nutrients which trickles down through three chambers representing the three segments of the large bowel - the ascending colon, transverse colon and descending colon. The fifth vessel, which sits on the floor, is a jar of brown muck. "That's the loo," says Gibson.

The model is for testing the effect of different ingredients on the output of the colon. Gibson's group feeds them to the model and analyses the output - including the gases. He is one of the world's leading fart scientists, and can talk at length on the subject.

"The population can be divided into two groups," he says, "smelly or inflammable." It all depends on which type of bacteria predominate in the bowel. People with sulphate-reducing bacteria are the smellies. They produce hydrogen sulphide - more so if their diet is high in sulphurous foods such as eggs, white bread and red wine. In the inflammable camp are people with a preponderance of methane-making bacteria. Methane is odourless but it allows people to, as Gibson puts it, "light their own flatus".

People can be divided into two groups: inflammable or smelly. It depends on the bacteria in our bowel

There is a serious side to this research. Too much hydrogen sulphide may be linked to ulcerative colitis, a rare but nasty bowel disorder. Gibson's group is trying to develop ways to damp down sulphate-reducing bacteria, looking at various probiotics - the gut's "good" bacteria - and prebiotics, types of fibre that encourage good bacteria to grow. One approach is to try to switch patients over from making hydrogen sulphide to methane. As well as helping their colitis it might give them a great party trick.

Gibson's team is also investigating whether probiotics and prebiotics can boost the good bacteria in the gut to prevent invasion by the ones that cause food poisoning. He is working with Clasado, the manufacturer of a new prebiotic called B-GOS, or bifidobacteria galacto-oligosaccharide. In September, Gibson's group showed that people who took one sachet a day starting a week before they went on holiday were less prone to travellers' diarrhoea. They got the trots at a rate of 23 per cent, compared with 38 per cent for those taking a placebo (*European Journal of Clinical Nutrition*, DOI: 10.1038/ejcn.2009.120).

As Gibson says, "there are not many people willing to spend their lives poking around in shit", but it is fortunate that some are - and that they are also prepared to delve into armpits, mouths, feet and other smelly places. Despite the humanitarian benefits of their work, though, these scientists still face difficulties at parties. "My wife always says tell them you do something different," Gibson says. "It's a funny area to be in."

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Beastly smells

I am looking at some slides from a meeting held by the American Society for Microbiology in May, when I come across an arresting picture: a labrador wearing what appears to be a life jacket. Then I see the attached "sulphur gas detecting pump" and I realise that what I'm looking at is a fart catcher. For dogs.

I track down the researcher who gave the lecture, George Fahey of the University of Illinois at Urbana-Champaign. For 34 years he has investigated the effects of different pet food ingredients on what comes out the other end. "The consumer purchases pet food on the basis of two issues," he says. The first is whether or not their dog likes it. "Number two is what it does to their faeces. Not only the odour but also the firmness of the stool. The stool has to be picked up. People are very cognisant of that."

To my disappointment, I learn that Fahey has never used the fart catcher himself. The picture came from a paper published by a group at the Waltham Centre for Pet Nutrition in Melton Mowbray, UK, which is owned by food company Mars (*American Journal of Veterinary Research*, vol 62, p 1014).

Nutritionist Richard Butterwick recalls the project fondly. "There was a funnel kept in place around the dog's anus, with a pipe that pumped any gas to a monitor," he says. "It was called the flatulence coat."

The coat was devised to test a new line of dog snacks with a cocktail of fart-busting ingredients: charcoal to adsorb gas; zinc to bind sulphurous compounds; and yucca extract, which has potent but mysterious odour-fighting powers. The treats worked a treat, and Pedigree Flatulence Control dog snacks were born.

Sadly the treats have since been discontinued, but they won't be the last product designed to tackle dog odours, predicts microbiologist Mel Rosenberg of the University of Tel Aviv, Israel. "Dogs smell," he says. "They produce smells from all over their bodies. They have bad breath, their coats smell, their flatulence smells, their defecation smells. Microbiology has huge potential here."

Clare Wilson is a features editor at New Scientist

http://www.newscientist.com/article/mg20427392.200-pongology-sniffing-out-a-cure-for-iffy-whiffs.html?DCMP=NLC-nletter&nsref=mg20427392.200

Let's face it, science is boring

- 16 December 2009 by **Stephen Battersby**
- Magazine issue 2739.

ASTONISHING discoveries in space, revelations about human nature, frightening news on the environment, medical advances that will banish life-threatening diseases: an inexhaustible stream of wonders runs through the pages of *New Scientist*. All tell the same tale. Science is exciting. Science is cutting-edge. Science is fun.

It is now time to come clean. This glittering depiction of the quest for knowledge is... well, perhaps not an outright lie, but certainly a highly edited version of the truth. Science is not a whirlwind dance of excitement, illuminated by the brilliant strobe light of insight. It is a long, plodding journey through a dim maze of dead ends. It is painstaking data collection followed by repetitious calculation. It is revision, confusion, frustration, bureaucracy and bad coffee. In a word, science can be boring.

My own brief and undistinguished research career included its share of mind-numbing tasks, notably the months of data processing which revealed that a large and expensive orbiting gamma-ray telescope had fixed its eye on the exploding heart of a distant galaxy and seen... nothing. I tip my hat, though, to *New Scientist*'s San Francisco bureau chief, who spent nearly three years watching mice sniff each other in a room dimly lit by a red bulb. "It achieved little," he confesses, "apart from making my clothes smell of mouse urine." And the office prize for research ennui has to go to the editor of NewScientist.com. "I once spent four weeks essentially turning one screw backwards and forwards," he says. "It was about that time that I decided I didn't want to be a working scientist."

Yet when it comes to the sober and sobering business of scientific drudgery, the denizens of *New Scientist* Towers qualify, at best, as mere dabblers. Here we wish to pay tribute to the truly heroic figures: those who have pushed back the boundaries of boredom and against all odds broken through to the sunlit uplands of scientific revelation - or not.

People like the celestial mechanic Urbain Le Verrier. By the mid-19th century, astronomers were aware that the outermost planet then known, Uranus, was travelling in an orbit that couldn't quite be explained by the influence of the sun and the other planets. The gravity of a new, unseen body was thought to be to blame. But where was it?

Through a feat of mathematical monomania that occupied the best part of a year, Le Verrier worked backwards from the orbital irregularities of Uranus to establish where the hidden planet ought to be found. His prediction, within 1 degree of the true position, allowed the German astronomer Johann Galle

to spot the body we now know as Neptune from his observatory in Berlin. The discovery led to instant acclaim for Le Verrier, adding a disappointing lustre to an otherwise satisfyingly dull achievement.

Astronomers in general have a strong claim to be champions of the most popular discipline of scientific tedium: the long stare. Amateur supernova hunters, for example, still eyeball galaxies through their telescopes night after night, comparing what they see with the features recorded on standard charts in the hope that a bright new point of light will suddenly have appeared. While a few among this band are lucky enough to see several supernovae, others may pursue a lifetime of observation without ever witnessing the explosion of a single star.

Astronomers are the champions of one popular discipline of science tedium: the long stare

At least there is a certain romance in the idea of a lonely stargazer scanning the cosmos for evidence of convulsions in distant galaxies. Sitting at a desk staring at photographs lacks even this vestige of glamour, yet until the advent of digital cameras most professional astronomers used their telescopes to expose photographic plates, and pored over the results to catalogue stars and galaxies. Understandably, they preferred whenever possible to get other people to do the poring for them - often women, who were deemed unsuited to more intellectually challenging tasks.

Henrietta Leavitt was one such human "computer", who scanned photographic plates at Harvard College Observatory in Massachusetts for two decades from 1895 to catalogue the brightness of stars. Brilliant and stoically dutiful, Leavitt performed this uncongenial task first as a volunteer and later for a salary of 25 cents an hour.

Leavitt built up a catalogue of 1777 stars that varied in brightness within the Magellanic Clouds - two dwarf galaxies near to our own Milky Way. In this great mass of data she noticed something. Among a class of variable stars known as Cepheids, she found that the period of pulsation is closely related to the star's absolute brightness. This provided a way to measure cosmic distances: find a Cepheid somewhere in the sky, time its pulsations, and you know how much light it puts out; compare that with how bright it looks, and that tells you how far away it is. It was thanks to Leavitt's distance calibration that Edwin Hubble was able to show that our galaxy is only one among billions, and to discover that the universe is expanding.

Brain drain

That's a pretty huge outcome. Such reward is by no means guaranteed. For every researcher who has ridden to triumph on the back of scientific perseverance, many have been carried away into obscurity. Especially worthy of honour in this regard is George Ungar, who claimed that memory could be transferred between animals by sucking out some of one creature's brain and sticking it into another. In one experiment published in *Nature* in 1968, he and his group went to the lengths of using electric shocks to train 4000 rats to fear the dark. They then dissected the animals, pulped their brains and used various methods to leach out some of the chemicals from the resulting goo. Mice injected with these rat extracts, Ungar reported, chose to spend less time in the dark than normal, non-ratted mice.

The legion of rats was not enough for Ungar. He went on to train 17,000 goldfish to distinguish between colours, then painstakingly dissected each one and puréed their brains in the name of science. Yet in the end it came to nothing. When other groups failed to reproduce Ungar's results, the idea of memory transfer became discredited.

He trained 17,000 goldfish to distinguish colours, dissected them and puréed their brains for science

All that pointless butchery must have been draining for poor Ungar, but even his efforts were trifling compared with science's most famous Herculean labours. To confirm the existence of their suspected new element, radium, Marie and Pierre Curie took tonnes of residue from uranium ore and processed it by

hand. Fitting the pattern of women getting the really grim jobs in science, Marie did most of the hard graft. She describes how she worked in "a wooden shed with a bituminous floor and a glass roof which did not keep the rain out... It was exhausting work to move the containers about, to transfer the liquids, and to stir for hours at a time, with an iron bar, the boiling material in the cast-iron basin." Over a span of four years, she turned a tonne of ore into 100 milligrams of radium chloride.

But here's the surprise. The Curies actually enjoyed their work. "We were very happy," Marie wrote. "We lived in a preoccupation as complete as that of a dream."

They are not the only ones. One of the great staring feats of modern times - a Nobel-garlanded staring feat, no less - belongs to John Sulston of the University of Cambridge. During one 18-month stretch he spent every available hour gazing down a microscope at growing nematode worms, eventually tracking the fate of every single cell from egg to adult. Squinting at grey blobs for a year and a half may sound dull to you and me - but it wasn't to Sulston. "It was fun. I love looking down a microscope," he says.

Boredom, it seems, is very much in the eye of the beholder. Scientists at the top of their game rarely become jaded, possibly because it is only the most tenacious individuals who ever succeed in research. Those with shorter attention spans - and you may pass your own judgement on the *New Scientist* staff mentioned earlier - are soon weeded out.

It's not all natural obsessiveness, though; there's an element of nurture too. Sulston points out that the most repetitious stuff happens only after years of working around a problem, trying to find a way in. By the time you are "strictly turning the handle", as he puts it, you may be the most skilled person at your chosen technique. Sulston ranked among the best in the world at keeping a close eye on slimy, grey microscopic worms, so using this skill became a pleasure.

We have every reason to be grateful for scientists' exceptional stamina. But if by now you have had enough of the tedious details, you can turn the page or click on the next story. Normal service will then resume as more glittering baubles of science are brought forth for your amusement.

Patience pending

To excel in the field of boredom, surely one of the most promising strategies is to embark on an experiment that will take a very, very long time. A few months clearly won't cut it. Even a project lasting years does not require the kind of resolve we are after. Decades, and you might be getting somewhere. The true mark of dedication, however, is if you expect your experiment to outlive you.

Take the example of John Lawes and Joseph Gilbert. In 1843 at Rothamsted research station in Hertfordshire, UK, they set out to test the effect of different fertilisers and growing schemes on crop yields. Their personal collaboration lasted a mere 57 years, but comprehensive results from these particular fields of scientific research would take a little longer. Some of Lawes and Gilbert's original experiments are still running more than a century and a half later.

There seems to be something about soil that attracts the contemplative mind. Together with his son Horace, Charles Darwin investigated the powers of the earthworm by setting a stone into the ground and monitoring its downward progress, at a speed of 2.2 millimetres per year, as the busy worms excavated soil from beneath it. Their worm stone continues its slow descent into the netherworld at Down House, on the outskirts of London, to this day.

While it would be pointless to actually sit and watch the effects of worm action, another infamously slow experiment does actually present a chance for you to see something happen - if you are very lucky, that is. At the University of Queensland in Brisbane, Australia, pitch is dripping out of a glass funnel. The flow was started in 1930, and since that date eight drops have formed and... dropped off. This illustrates that

although pitch behaves as a brittle solid - it smashes if you hit it with a hammer - it is actually runny. Just not very runny: the Brisbane sample is about 10 billion times as viscous as water.

No one has yet witnessed a drop fall, so if you can tune in to mms://drop.physics.uq.edu.au/PitchDropLive you could be the first. Don't be confused by the voice-over, which dates from almost a whole drop-age ago. With luck you might only have a few years to wait.

These past glories, magnificent as they are, need not limit your ambition. Assuming that some form of civilisation endures, why not devise experiments that will yield results only after many millennia? Today's researchers can see evolution in action only by using rapid breeders such as bacteria, as in the experiment that followed 40,000 generations of *E. coli* over 20 years. We can look forward to watching the evolution of mice. Or humans - an experiment that would take around 1 million years for the same number of generations. Or how about giant tortoises?

The pitch-drop set-up might be reproduced with an even more viscous fluid - or perhaps even glass. Contrary to the widespread notion that medieval windows have slowly flowed to become thicker at the bottom than the top, there is no evidence that any form of silica glass is fluid at room temperature. In the interests of scientific thoroughness, though, we should make sure. A carefully controlled 10,000-year experiment should do the trick. Some descendant will have the pleasure of writing up the results: "Nothing happened."

Just hot air

Carbon dioxide is infamous today as the tiresome, unwanted by-product of just about everything we do. But working out its ill effects on our climate has itself been a lesson in tedium. It begins in the long northern winter of 1894, when the Swedish physicist Svante Arrhenius decided to distract himself from marital problems with some interminable quill-scratching. His aim was to find out whether reduced levels of CO_2 in the atmosphere might have caused past ice ages. CO_2 was already known to trap infrared radiation. To arrive at the size of the effect on Earth, though, took Arrhenius more than a year of laboriously calculating the feedback effect of clouds and chopping up the globe's surface into zones of vegetation and landscape that reflected sunlight differently.He eventually found that a lack of CO_2 could indeed have caused temperature drops equal to those seen during glaciations - and also, incidentally, that doubling levels of the gas would raise temperatures by more than 5 °C, which is close to modern estimates. Yet Arrhenius himself seemed singularly unimpressed with the result of his labours. "It is unbelievable that so trifling a matter has cost me a full year," he said.

He should have counted himself lucky: the same gas was to occupy the American atmospheric scientist Charles Keeling for more than 40 years. Rather than taking Arrhenius's mathematical route, Keeling chose that other well-trodden path to the land of scientific nod: that of persistent, precise observation. Starting in 1958, he monitored the concentration of CO_2 in the air to find out whether the overall global level was changing, be that change ever so slow. It was rather like setting out to watch the grass grow, without knowing whether grass actually does grow. With true dedication, Keeling made his measurements in isolated places such as the peak of Mauna Loa in Hawaii to eliminate any interesting local fluctuations that might be caused by forests or factories.Funding agencies tend not to smile on such slow-burn projects, and even after Keeling found the first evidence that CO_2 levels were rising, he faced years of wrangling with various committees to keep the money coming in. His medal for monotony hangs from a tangle of red tape.

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http://www.newscientist.com/article/mg20427392.300-lets-face-it-science-is-boring.html?DCMP=NLC-nletter&nsref=mg20427392.300

The shape of gifts to come

- 16 December 2009 by **David Hambling**
- Magazine issue 2739. **Subscribe** and get 4 free issues.
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Oops, I Dropped it again

Even the clumsiest klutz needn't worry about dropping an expensive new phone, camera or laptop if it is protected by a "smash-proof" case. Made using a combination of granular materials, ceramics and polymers, such cases will be engineered to channel shock waves away from sensitive components, and then trap or cancel them out. A consortium of American universities, funded by the

US Department of Defense, hopes to produce prototypes by 2014. The military are interested because it would make munitions safer to handle.

The vodkamatic

Freshly distilled and drip-fed to your own hip flask, a steady supply of vodka could be produced by a bioreactor-on-a-chip that runs a continuous fermentation and distillation process. All the necessary components, mostly based on microfluidics, are under development and could be turned into consumer products - local liquor laws permitting.

Everlasting power

Imagine putting a battery in your latest gadget knowing that you'll never have to replace it. Several industrial and university teams are competing to develop a new generation of small, long-lasting batteries powered by radioactive decay. Among the most promising are betavoltaics, which use a simple semiconducting device to generate current by capturing electrons from a radioactive material. One approach is to use a liquid semiconductor, which helps the battery last longer. Betavoltaics promise energy densities well beyond ordinary batteries, but there's one inevitable problem: how to dispose of them.

Lord of the ringers

This phone will let you listen to digital radio, watch TV, check the weather, find buried treasure - and, yes, even call your friends. To manage all this it will use software that reprograms the radio circuitry so it can pick up any number of different signal types, including Wi-Fi, 3G phone networks and digital TV. Throw in chip-based, reconfigurable sensors - under development at the Pentagon's Defense Advanced Research Projects Agency (DARPA) - and the phone could also measure pressure, temperature and even magnetic fields.

Space invader

Fill the space around you with glowing images that hang in the air and you will be able to step inside a computer game. A powerful laser projector generates streams of ultra-short, precisely focused pulses that ionise the air, creating point-flashes of light that can be used to construct virtual 3D objects. While the US army wants to use the technology to put snipers off their aim, engineers at Burton, a company based in Kawasaki City, Japan, are aiming to have a demo system ready for the high street by 2011.

Follow that footwear

Your car has one and soon your shoes could too: a personal navigator that guides you to wherever you want to go, indoors or out, with perfect precision - to the right entrance of the maternity ward, the pizza shelf at the supermarket or even to a particular filing cabinet in a sprawling office. Conventional satnav can't offer this accuracy and is only reliable outdoors, hence DARPA's plan for inertial navigation systems based on chips small enough to fit in the heel of a shoe.

Six legs good

Need a runaround that goes well cross-country? In 2000 Finnish company Plustech developed a six-legged logging machine that took the roughest terrain in its stride. It was abandoned, but DARPA has kept the dream alive with its own walking machines: Big Dog, that can lug an adult about 20 kilometres, and now Big Dog on steroids, with range and carrying capacity boosted by 30 per cent.

Fluttering by

Yearning for the sights of summer all the year round?

A flock of colourful artificial butterflies that take off and follow you round the room should be just the thing. Closely modelled on their biological counterparts, and relying on the same aerodynamic principles, they are being developed from nano air vehicles (NAVs) commissioned by DARPA in 2007 to give troops a flying eye. Prototype NAVs are already airborne in the lab, and field tests are planned for 2010.

Make like a gecko

If life is driving you up the wall, super-grip shoes will let you go one better and walk across the ceiling too. Nicola Pugno at the Polytechnic University of Turin in Italy has already made gloves that can support around 10 kilograms each. The grippy surface is covered in millions of ultrathin nanotubes that mimic the way the fine hairs that coat a gecko's feet behave.

The secret lies in the accumulation of van der Waals forces between the nanotubes and the surface they are adhering to.

Shoes could be, well, the next step.

Crash-proof choppers

Lightweight batteries have brought us remote-controlled helicopters small enough to fly indoors. Unfortunately, they are so hard to fly that most of us struggle to keep them airborne, let alone swoop them round the furniture. So DARPA's plan for an autopilot-on-a-chip is good news. Aimed at military uncrewed aerial vehicles, it will contain sensors and inertial guidance. Built into tiny choppers, it will help keep them stable so we can concentrate on having fun: dodging chairs and pets, or just dogfighting over the dinner table.

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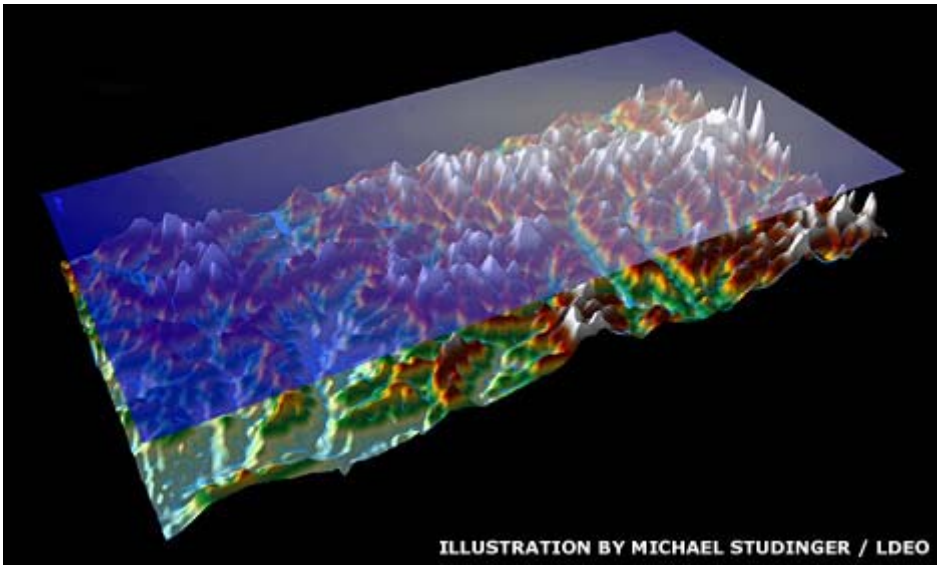
http://www.newscientist.com/article/mg20427391.700-the-shape-of-gifts-to-come.html?full=true&print=true

Data to expose 'ghost mountains'

By Jonathan Amos
Science correspondent, BBC News, San Francisco

Scientists who mapped one of the most enigmatic mountain ranges on Earth have given a first glimpse of their data.



An international team spent two months in 2008/9 surveying the Gamburtsevs in Antarctica - a series of peaks totally buried under the ice cap.

The group has told a major conference in the US that the hidden mountains are more jagged than previously thought.

They are also more linear in shape than the sparse data collected in the past had suggested.

This latter finding hints at a possible origin for the mountains whose existence has perplexed scientists for 50 years.

"If you have a linear structure it makes them more like the Alps or the Appalachians," explained Dr Michael Studinger from the Lamont-Doherty Earth Observatory (LDEO) of Columbia University, New York.

"These are mountain ranges that formed by the collision of tectonic plates." But he stressed that the analysis of the survey data was in its infancy and the team would publish their final assessments in forthcoming papers in the formal scientific literature.

Dr Studinger is one of the leading scientists on the AGAP (Antarctica's Gamburtsev Province) project. He has been speaking here at the American Geophysical Union's (AGU) Fall Meeting, the world's largest annual gathering of Earth scientists.

The mountains were discovered by a Soviet team during the International Geophysical Year in 1957-8. Their detection was a complete surprise because the rock bed in the middle of the Antarctic continent was assumed to be relatively flat.

It led many to speculate that the Gamburtsevs might be old "hot spot" volcanoes that had punched their way through the Earth's crust, much like the Hawaiian islands have done in the middle of the Pacific.

The range has since become the subject of intense scientific fascination because it was almost certainly a nucleation point some 30 million years ago for the huge ice sheets now covering Antarctica. Studying them has been immensely difficult, however. Conditions are brutal; temperatures can go down to more than -80C.

It was only with the concerted effort organised around International Polar Year in 2007-8 that a full-scale aerogeophysical survey became possible. Two instrumented Twin-Otter aircraft were flown out of remote field camps and collected a range of data.

They crisscrossed the hidden peaks, flying a total of 120,000km. They gathered gravity, magnetic and ice thickness information, took radar images of the rock bed and the layers within the ice; and made a map of the ice-sheet's surface with a laser. "We have now reached a point in the data processing that allows us to start scientific work with the data," Dr Studinger told BBC News.

The shallowest ice covering the mountains is hundreds of metres thick. The deepest ice detected is about 4,800m thick. The mountains themselves are standing about 2,500m above sea level. It is now clear the range has a defined linear trend, in contrast to the previously mapped circular feature, and that this trend strikes predominantly to the north-east.

The data also reveals a very rugged landscape with high peaks and deeply incised valleys which have been worked in the past by both river and ice processes. "Before we had this data we couldn't see the valleys and therefore we had no way of being able to quantify the role of glacial and fluvial processes which is key to understanding cryosphere and climate evolution," said Dr Fausto Ferraccioli from the British Antarctic Survey.

Studying what happened in these valleys could give clues as to how fast the Gamburtsevs became encased in ice.

The survey also detected pockets of liquid water at the base of the ice and the team will now try to work out if and how these ponds might be interconnected.

"We're seeing evidence of water in the very centre of the ice sheet," said Dr Robin Bell, also from LDEO.

"We're really excited about being able to use this dataset to see how valleys that were carved by rivers and then overprinted by glaciers are now driving waters underneath the ice sheet." In addition, Dr Ferraccioli said it was possible a location could be found where ices might be drilled to retrieve information on the ancient climate of Antarctica. "There could be ice that is older than 1.2 million years - somewhere between 1.2 and 1.5 million years," he told BBC News. "We will have to do an analysis of the ice layers. But I think it's going to be quite a challenge because the topography is very rough and the layers are quite buckled."

Chinese scientists reported in June the results of survey data they had acquired at the Gamburtsevs. This was, however, just a 30km by 30km square. In the AGAP project, over 20% (one-fifth) of the East Antarctic Ice Sheet was explored.

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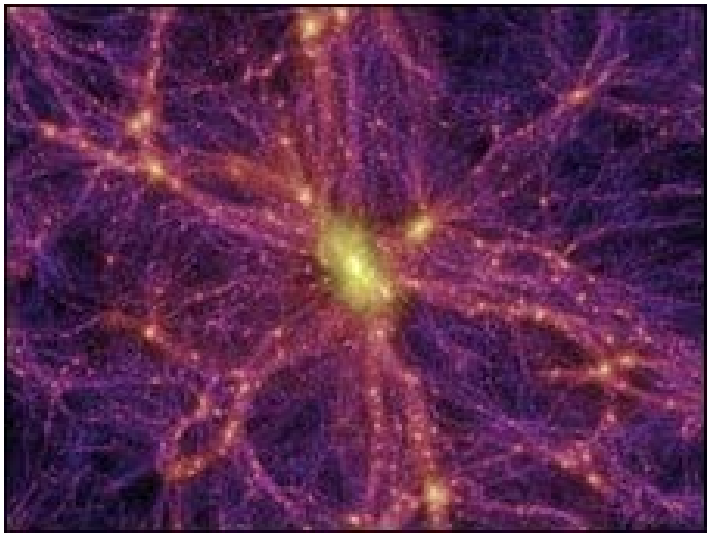
Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8420837.stm

Published: 2009/12/18 17:25:40 GMT

The first glimpse of dark matter?
By Victoria Gill
Science reporter, BBC News

US scientists have reported the detection of signals that could indicate the presence of dark matter.



A team announced on Thursday detecting two events with characteristics "consistent with" what physicists believe make up the elusive matter.

The main announcement came from the Department of Energy's Fermi National Accelerator Laboratory near Chicago.

The scientists were keen to stress that they could not confirm that what they had seen was definitely dark matter.

"While this result is consistent with dark matter, it is also consistent with backgrounds," said Fermilab's director, Pier Oddone.

Several US universities and institutes have contributed to the Cryogenic Dark Matter Search (CDMS), an experiment designed to detect the dark matter particles.

The tests are being carried out in an underground laboratory in a defunct mine in northern Minnesota.

"In 2010, the collaboration is installing an upgraded detector at the Soudan mine with three times the mass and lower backgrounds than the present detectors," said Dr Oddone.

"If these two events are indeed a dark matter signal, then the upgraded detector will be able to tell us definitively that we have found a dark matter particle."

It seems that ordinary matter - gas, stars, planets and galaxies - makes up less than 5% of the Universe. The remainder is unseen.

Astronomers believe that 70% of this is "dark energy" - a hypothetical phenomenon that affects the rate at which the Universe expands.

The remaining 25% is believed to be dark matter.

Theories suggests that dark matter is made up of subatomic particles called Wimps - Weakly Interacting Massive Particles.

These are thought to have a similar mass to the nuclei that give each atom the majority of its mass, but are predicted to "bounce off" rather than interact with any other matter.

This would make the particles themselves impossible to find. So the detectors in the CDMS experiment are designed to pick up the tiny amount of energy that Wimps leave behind as they scatter - the only clue they might leave behind.

Others hold that the dark substance consists of everyday matter, but that this ordinary matter, referred to as Massive Astrophysical Compact Halo Objects (Machos), happens to radiate little or no light.

The CDMS scientists believe they may have seen evidence of Wimps - heat deposits left in silicon and germanium detectors that had been cooled to very near absolute zero (-273C).

"Layers of shielding materials, as well as the half-mile of rock above the experiment, are used to prevent most of the background particles from reaching the detector," a Fermilab statement explained.

Professor Carlos Frenk is a cosmologist from Durham University in the UK, who develops theories about the structure of the Universe.

He described the results as "deliciously inviting".

"Dark matter is what makes the Universe interesting," he told BBC News. "It is responsible for the bulk of the gravitational forces that give the Universe its shape."

Professor Frenk said that the world of cosmology had been "awash with gossip" about the highly anticipated results for the past week.

Commenting on why he felt the scientists had made the announcement before they could confirm their findings to be dark matter, he said that there was a competition among scientists to be the first to make the discovery.

"This is one of the most important problems in science," he told BBC News.

"We only have a glimpse here, but it's so tantalising that you couldn't go to bed without telling the whole world about it."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8420089.stm

Published: 2009/12/18 11:52:13 GMT

Fake blood product for soldiers

Scientists say they have made a synthetic blood-clotting agent that could help wounded troops and patients.

In the lab, the fake platelets cut bleeding in half compared with having no treatment.

They could offer doctors a limitless supply with a longer shelf life than fresh donor platelets, the journal Science Translational Medicine reports.

The Case Western Reserve University team in the US hopes the product could become available in coming years.

The stuff the fake platelets are made from is already used in treatments approved by the US regulators, which the scientists say should help speed things along.

James Bertram and Professor Erin Lavik developed the platelets using biodegradable polymers and designed them to home in and link up with a patient's own platelets at the site of injury.

“ **This could be a complement to current therapies** ”
Lead scientist Professor Erin Lavik

Natural blood platelets are good at helping wounds to clot but can be overwhelmed by large injuries.

Using donor platelets from other people can boost clotting but carries risks of complications, including rejection. They also have a shelf life of only five days.

The researchers' aim is to develop a treatment that medics can keep in their packs to treat wounded soldiers in the field.

Plug a gap

Professor Lavik said: "This could be a complement to current therapies.

"The military has been phenomenal at developing technology to halt bleeding from external or compressible injuries.

"But so many injuries are from blast traumas where the damage is on the inside. And it can be hard to stop bleeds like this in the field."

She said the fake platelets could offer a viable solution and an immediate treatment before transfer to a field hospital.

The synthetic platelets work alongside the body's own platelets to quickly stem the bleeding.

In rats, injections of the therapy prior to injury halved bleeding time. When given 20 seconds after the injury, bleeding time was cut by a quarter.

Supply challenge

To avoid the fake platelets clumping together and creating an artificial clot, each synthetic platelet is built with a surrounding water shield.

This also means that any surplus platelets not needed for the clotting should be flushed out of the body with no ill effects.

Trauma specialist Colonel Tim Hodgetts, from the Royal Centre for Defence Medicine, said the military currently relies on blood stocks shipped from the National Blood Service by the RAF.

"This can be phenomenally challenging, particularly because the fresh platelets have a five-day shelf life.

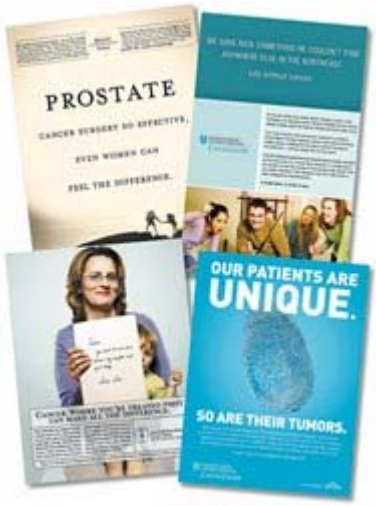
"Within the military we would always consider innovations in medical practice.

"But it would only be attractive if it had proven benefit and safety in humans."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8413336.stm

Published: 2009/12/18 00:40:18 GMT

Cancer Center Ads Appeal to Emotions at a Fragile Time
By NATASHA SINGER



A print advertisement for prostate cancer surgery at Mount Sinai Medical Center in Manhattan is typical of the way many elite research and teaching hospitals sell hope to the public.

“Our newest prostate specialist, Dr. David Samadi, has pioneered a minimally invasive approach that allows him to retain the highest cancer cure rates with the lowest risk of side effects,” says the ad.

Highest cure rates. Lowest risk. What evidence does the medical center have to back up such superlatives?

The ad’s claims are based on the successful results of Dr. Samadi’s operations and testimonials from his patients, said Jane Zimmerman, Mount Sinai’s chief marketing officer.

In medical science, such anecdotal data would not be considered statistically valid. But ads for nonprofit medical centers are not held to scientific standards of evidence.

“There seems to be a disconnect between the business end of the cancer treatment industrial complex and the physicians on the front lines treating patients,” said Dr. John D. Birkmeyer, a cancer outcomes researcher who is a professor of surgery at the University of Michigan Health System.

Some medical centers take a similar approach to marketing their services in specialties like cardiovascular disease and cosmetic surgery. But cancer treatment advertising is particularly fraught with emotion, critics say, because it can play on fears about this disease.

If a drug maker ran an ad for a cancer medicine, Food and Drug Administration regulations would require the company to be able to support any superiority claims with substantial evidence from rigorous clinical studies.

But federal agencies cannot limit the ad claims made by nonprofit medical centers about their ability to cure people of diseases like cancer, according to the government’s main ad regulator, the Federal Trade Commission.

Cancer experts interviewed for this article say there are no comprehensive statistics showing that any one elite medical center has better overall cancer success rates than its competitors.

Yet the advertising campaigns of prestigious cancer centers often use superlatives, promote the latest technologies, promise unique care or recount miraculous patient recoveries. Based on such ads, a consumer might reasonably assume that the medical profession has made more progress in the decades-long war on cancer than the more sobering facts would show.

The problem with many ads is the implication that choosing a particular hospital could be the deciding factor in whether a cancer patient lives or dies, said Dr. H. Gilbert Welch, a medical professor at the Dartmouth Institute for Health Policy and Clinical Practice.

People with some more complicated cancers or rarer diseases like leukemia do tend to fare better at comprehensive cancer centers. But Dr. Welch and others worry that such ads could persuade people with localized cases of more common diseases like prostate cancer to travel long distances from their families at great expense to obtain treatment that may be as successful, or unsuccessful, as the treatment available much closer to home.

And, Dr. Welch said, the ads may exaggerate the benefits of cancer treatment, implying that a cure is certain.

But marketing executives defend their approach, saying cancer treatment ads tend to play more heavily on emotion than on medical statistics because the ads are not intended to inform people who already have the disease. They are meant to make an impression on future patients, who may decide on treatments years after they have seen an ad, or to sway influential people who might advise a future patient.

“This isn’t retail advertising,” said Ellis Verdi, president of the DeVito/Verdi Agency in Manhattan.

The agency produced the Mount Sinai ad, which ran in The New York Times, and has created cancer ads for other hospital clients. “This is reputation advertising,” Mr. Verdi said. “There is a very big difference.”

Ms. Zimmerman of Mount Sinai said the medical center’s marketing campaign, including about 30 treatment ads for cancer and other diseases, highlighted the institution’s expertise in treating complicated cases. All the information in the ads was accurate, she said.

In the case of the ad with the superlative prostate cancer claims, it was later revised to say that Dr. Samadi’s approach gives “high rates of success coupled with lowered risks of side effects.” Ms. Zimmerman said Dr. Samadi was not available to be interviewed.

Marketing Technology

“We gave Nick something he couldn’t find anywhere else in the Northeast. Life without cancer.”

That was the text of a print ad last year by the Massachusetts General Hospital Cancer Center in Boston, promoting its $50 million center for proton beam therapy, a kind of high-energy radiation to treat brain tumors and other cancers.

The hospital was the only medical center in the region with a proton therapy center, the ad said, enabling doctors there to successfully treat the brain tumor of a young man named Nick.

The ad’s concept was that Nick had a greater chance of survival because the precise proton beam could destroy malignant brain tissue while leaving surrounding healthy brain tissue intact, said Jodie Justofin, the marketing director at Mass General’s cancer center.

If the maker of a radiology machine had run an ad promoting its technology as superior to other ways of treating brain cancer — or promising "life without cancer" — F.D.A. rules would have required the company to be able to support the claim.

But Mass General has no such federal restrictions. And no rigorous studies have shown that proton beam therapy has higher brain-cancer cure rates than other treatment methods, said Dr. Birkmeyer of Michigan. "The ad might be accurate that they are the only hospital in the Northeast with this particular widget," he said. "But it could be misleading that the availability of this particular widget gave this patient better odds of survival."

Dr. Thomas F. DeLaney, the medical director of the Francis H. Burr Proton Therapy Center at Mass General, said he had no involvement in the ad and did not have any information about Nick.

But the advantage of the proton beam, Dr. DeLaney said, is that it delivers about 60 percent less radiation to normal tissue surrounding a tumor, allowing treatment of certain cancers — particularly pediatric brain tumors — that may otherwise be untreatable.

And officials at the hospital say there have not yet been rigorous comparative studies of proton beam therapy because the tumors it treats are extremely rare and, with children, there would be ethical concerns.

The Testimonial

It seems like a miracle.

"Cancer, You said I'd never bear children," reads the handwritten letter, held out by a pretty, healthy-looking woman, as a toddler peeks from behind the paper. "My daughter says you're wrong."

That recent print ad from Memorial Sloan-Kettering Cancer Center in Manhattan tells the story of Michelle Rogala, a patient with cervical cancer.

Ms. Rogala's hospital in New Jersey could offer her only a hysterectomy, an operation that would have left her unable to have children. Instead, she went to Memorial Sloan-Kettering, where she entered a clinical trial that was studying less invasive surgery. Ms. Rogala now has a little girl named Maddie.

If a customer had given a testimonial about, say, her amazing weight-loss at a for-profit clinic, the F.T.C. would have required the ad to clearly describe the results a more typical consumer might expect. But these federal rules do not apply to patient-testimonial ads for non-profit cancer centers, a spokeswoman for the commission said.

In a recent telephone interview, Ms. Rogala, a 37-year-old meeting planner in Monroe Township, N.J., said that hers had indeed been a special case.

She had early-stage cervical cancer, she said, making her eligible for a novel operation that has now become a standard treatment at the center. After her operation, doctors told her she would need fertility treatments to conceive. But she said she turned out to be one of the few patients in the study who did not need radiation — which can cause fertility problems. She later became pregnant without medical intervention.

Ms. Rogala said she wanted her ad to inspire women with cervical cancer to investigate fertility-sparing surgery. But if a woman has more advanced cervical cancer, she said, "unfortunately, it may not be an option."

Ellen Miller-Sonet, vice president for marketing at Memorial Sloan-Kettering, said consumers seeing the ads realizes that these were individual stories. “They know that no two people are the same,” she said.

But Dr. Bruce A. Chabner, clinical director of the cancer center at Mass General, argues that treatment ads should avoid testimonials because any hospital could find a cancer patient who had a positive experience. The nation’s major cancer centers, he said, should establish collective advertising guidelines.

“Would I like to see these ads be more technical and less testimonial in their presentation?” Dr. Chabner said, referring to ads by cancer centers, including his own institution. “Sure I would.”

Promoting Research

Mass General’s cancer center is “among the first hospitals in the nation to broadly test tumors for specific genetic mutations, helping us to personalize cancer treatment.” So ran an ad, illustrated with a giant fingerprint, this year in magazines like U.S. News & World Report.

The ad promoted Mass General’s genotyping research program, which tests lung and colon cancers for genetic mutations that may respond to novel drugs aimed at specific molecular targets.

The intent of the ad, said Ms. Justofin, the cancer center’s marketing director, “was to set Mass General apart as being on the cutting edge of offering the latest clinical trials.”

But the ad did not explain that some patients might be treated with existing drugs while others would have to enroll in a clinical trial to be eligible for the experimental drugs.

The F.D.A. does regulate clinical trials. And, had the ad been an overt solicitation of volunteers for a trial, F.D.A. rules would have required a special institutional review board to vet it for balance on behalf of the potential research subjects.

Mass General’s review board, for example, has guidelines saying that recruitment ads for research subjects should prominently display the word “research” and should not “ ‘hype’ the study.”

But medical centers typically do not ask their review boards to vet ads that promote the general idea of access to clinical trials.

Dr. Steven Woloshin, an associate professor of medicine at the Dartmouth Medical School, said that because many clinical trials fail, cancer centers should not promote experimental treatments in their advertising campaigns aimed at consumers.

A few years ago, Dr. Woloshin and colleagues published a study that found that many ads “seemed to place the interests of the medical center before the interests of the patients.”

Cancer treatment marketing seems all the more troubling because it could offer false hope to ill patients, said Dr. Lisa M. Schwartz, a co-author and an associate professor of medicine at Dartmouth.

“If you really wanted to give people real information, you would give them statistics,” Dr. Schwartz said. “But that wouldn’t be nearly as compelling.”

http://www.nytimes.com/2009/12/19/health/19cancerads.html?_r=1&th&emc=th

Not All Drugs Are the Same After All
By LESLEY ALDERMAN

LET me start by saying I'm a fan of generic drugs. They save Americans billions of dollars each year and give us access to wonderful drugs at affordable prices. I've recommended generics in this column many times and use them myself when possible.

But there is a gnawing concern among some doctors and researchers that certain prescription generic drugs may not work as well as their brand-name counterparts. The problem is not pervasive, but it's something consumers should be aware of — especially now that more insurers insist that patients take generic medications when they are available.

Let me also prepare the groundwork for what I hope will be full and frank reader comments, by acknowledging that this issue is controversial.

Joe Graedon, who has been writing about pharmaceuticals for three decades and runs a consumer advocacy Web site, the People's Pharmacy (peoplespharmacy.com), was 100 percent behind generics for many years.

"We were the country's leading generic enthusiasts," he told me recently. But over the last eight or nine years, Mr. Graedon began hearing about "misadventures" from people who read his syndicated newspaper column, also called The People's Pharmacy.

The stories were typically from patients who were switched from a brand name drug to a generic one and had side effects or found that their symptoms returned — or even became worse than before they were medicated. Most recently Mr. Graedon has been hearing complaints on his Web site about generic forms of the antidepressant Wellbutrin XL 300 (known as Budeprion XL 300 in one generic form), the heart medicine Toprol XL (metoprolol succinate) and the antiseizure medicine Keppra (levetiracetam).

"Consumers are told generics are identical to brand name drugs, but that is clearly not always the case," Mr. Graedon said.

Some specialists, particularly cardiologists and neurologists, are concerned about generic formulations of drugs in which a slight variation could have a serious effect on a patient's health. The American Academy of Neurology has a position paper that says, in part, "The A.A.N. opposes generic substitution of anticonvulsant drugs for the treatment of epilepsy without the attending physician's approval."

But insurers tend to argue otherwise. On Thursday, ExpressScripts, which handles drug insurance for big employers, put out a news release announcing results of a study it sponsored that found no difference in hospitalizations or emergency-room visits for people on brand-name epilepsy drugs compared with those taking generics.

The Food and Drug Administration, meanwhile, says it stands behind generic medications and its methods for approving them.

"We have not seen any scientific studies that show generics do not hold up as well as brand name drugs," says Gary J. Buehler, director of the agency's office of generic drugs. "We believe the generic drugs we approve work in everyone."

The American Medical Association concurs. A spokeswoman for the group told me in an e-mail message, "the A.M.A. position is that as a whole generic drugs do work as well as name-brand drugs."

Yet, after hundreds of consumers posted messages about problems with the generic drug Budeprion XL 300 on the People's Pharmacy Web site, Mr. Graedon worked with an independent laboratory, ConsumerLab.com, to test the drug, which in other generic versions is typically known as bupropion.

The lab found that Budeprion XL 300 released the active drug at a different rate than the brand name Wellbutrin XL 300. Mr. Graedon and the lab conjecture that the different dissolution rates might be to blame for the reported side effects and lower effectiveness of Budeprion.

But Mr. Buehler at the F.D.A. explained to me that over the course of 24 hours a patient ends up with the same amount of the drug in the bloodstream, so there should be no reason for a variation in effectiveness. "We remain puzzled," he said.

The maker of Budeprion XL 300, Teva Pharmaceutical Industries, recently announced that it would conduct a clinical trial comparing its product against the original, Wellbutrin XL.

A Teva spokeswoman said in an e-mail message that the company was working with the F.D.A. on a study "specifically designed to answer the questions raised following the recent anecdotal commentary on generic budeprion."

"We believe the study and the resulting data will provide further scientific support for the product's bioequivalence to the innovator drug," she said.

To parse that statement — or at least understand "bioequivalence" — it is worth taking a step back to consider what a generic drug is and how it gets approved.

When a name-brand drug's patent expires, other manufacturers are generally free to create their own version of that product. If a drug is popular, a dozen or more companies may rush in to create a copy of it.

According to F.D.A. rules, the new generic version must "have the same active ingredient, strength and dosage form" as the brand name or reference product.

A generic medication must also be bioequivalent to the brand name drug, meaning that it must "be shown to give blood levels that are very similar to" the brand name product, according to a fact sheet on the F.D.A.'s Web site. Generally, the only test that a maker of a generic medication must perform to receive F.D.A. approval is one that establishes the "bioequivalence" of the product. This test is done on healthy volunteers and compares the blood levels of the reference drug to the generic one.

According to Mr. Buehler of the F.D.A., to be considered bioequivalent, the generic drug must reach a blood serum level that is 80 to 125 percent of what the reference product achieves. But Mr. Buehler said that in reality the spread was not nearly that large. He noted that the F.D.A. conducted a large study and found that the average difference in absorption into the body between a generic and brand name drug was only 3.5 percent.

Some specialists, though, worry that the allowable range for bioequivalence is too wide, especially for patients who are taking medication to control problems like arrhythmias or seizures.

If a patient with the heart arrhythmia known as atrial fibrillation who also has risk markers for stroke gets a blood thinner for which the levels are too low, "there is risk for stroke, and if the levels are too high it could result in bleeding," says James A. Reiffel, a cardiologist and professor of clinical medicine at Columbia.

Neurologists who treat epilepsy have similar concerns. Two studies published last year in the journal Neurology found that patients who switched from a brand-name product to a generic one had more seizures or higher hospitalization rates.

"For many drugs, generics are just fine," said Kimford Meador, a professor of neurology at Emory University.

"But when you're taking a seizure medication, the therapeutic window is narrow," Dr. Meador said. "If the absorption of the drug is slightly different between brand and generic or between generics, then the patient could have a seizure, and that seizure could lead to serious injury or perhaps even death."

The problem is not just in changing from a name-brand drug to a generic, Dr. Meador said, but also switching from generic to generic. And the patient may not even know the change is happening.

When patients are on maintenance medication for which a generic is available, they might be given a different version of the generic drug when refilling their prescriptions. A pharmacy might stock one generic for a few months, and then switch to another a few months later, if the store is offered a better deal on it.

A pharmacist is not required to notify the patient of the change, although some choose to do so.

So for a few months you might receive a drug that was on the low side in the bioequivalence test, and then be switched to one on the high side of the test.

Stephanie Ford, 29, who spoke on condition that she not be otherwise identified, had been taking Lamictal to control her bipolar disorder. When a generic version came out two years ago, her insurer switched her to it.

Ms. Ford found that the generic drug, lamotrigine, worked just as well as the name brand and cost her just $10 a month instead of the $45 copayment she had been spending on the brand name. (For a person without insurance, Lamictal can cost about $300 a month, depending on the dosage.)

But when her insurer then urged her to order her medication by mail, she received another generic version of Lamictal and her symptoms returned.

"After about a week," she wrote in an e-mail message, "I noticed a difference in my emotional state (and nothing changed in my life) and by a week and a half, I had digressed to the state I had been before being on medication."

Ms. Ford has found a local pharmacy that carries the original generic. She now buys the medication directly from that store. Because her insurer charges her a $5 penalty for not using mail order, her copayment is now $15.

She says her condition has once again stabilized.

http://www.nytimes.com/2009/12/19/health/19patient.html?ref=health

Holding Doctors Accountable for Medical Errors

By PAULINE W. CHEN, M.D.

Ten years ago, a national panel of health care experts released a landmark report on medical errors in the American health care system. Published by the Institute of Medicine, "To Err is Human: Building a Safer Health System" estimated that as many as 98,000 people died in hospitals each year as a result of preventable mistakes. Being hospitalized, it turned out, was far riskier than riding a jumbo jet.

While the report offered comprehensive strategies to improve safety, its main conclusion was that medical errors were primarily a result of "faulty systems, processes and conditions that lead people to make mistakes or fail to prevent them."

Spurred on by this finding, health care leaders across the country began addressing errors believed to be a result of systemic flaws. They instituted more rigorous hospital accreditation standards and procedures, increased public reporting and transparency and established systemwide safety changes like the mandatory use of checklists, the placement of hand sanitizing gel dispensers throughout hospital wards and the regulation of physician duty hours. For nearly a decade, this paradigm of systems failure defined the national movement to improve patient safety.

But more recently, some health care safety experts have begun questioning the assumption underlying the report's conclusions: that only health care systems, and not individual clinicians, could be held accountable for medical mistakes.

Dr. Robert M. Wachter, a professor of medicine at the University of California, San Francisco, and a national leader in patient safety, recently published two critiques of the safety movement, one in Health Affairs and one in The New England Journal of Medicine. Both urge physicians to begin acknowledging their individual roles in medical errors. "A blame-free culture carries its own safety risks," he writes. "As we enter the second decade of the safety movement, while the science regarding improving systems must continue to mature, the urgency of the task also demands that we stop averting our eyes from the need to balance 'no blame' and accountability."

I spoke to Dr. Wachter recently about his assessment of the patient safety movement, the need for increased accountability and the impact of some of these changes on the patient-doctor relationship.

Q. In one of your critiques, you give the patient safety movement a grade of "B–," a modest improvement over the "C+" you gave five years ago. How would you have graded patient safety 10 years ago when the Institute of Medicine report was published?

A. I would have given it a "D–." Ten years ago, safety happened almost randomly; you happened to have good people or you got lucky. But 10 years is not a long time, and I've been extraordinarily impressed with the progress so far.

That being said, when my kids come home with a "B–," they all get a talking to.

Q. What is a major patient safety area that still needs to be addressed?

A. Ten years ago, we approached patient safety as a series of system flaws; we believed that most errors were committed by good competent people doing something no more complicated than forgetting a cellphone. But in the last few years some of us in the patient safety field have begun to feel uneasy about that approach. When there are reasonably safe standards available, what do you do when people simply don't adhere to them? At some point, it's no longer a "systems problem."

Q. In one of your articles, you use the example of hand hygiene to illustrate your point.

A. Hand hygiene seemed like a good place to start studying how we might find a new balance between "no blame" and accountability. We know that this particular problem can be morbid, sometimes fatal, and that the systems issues, such as the availability of sanitizing gel dispensers in hospitals, have by and large been fixed. But even with those changes in place, few health care systems have had sustainable rates of hand hygiene over 80 percent. We have not achieved the rate we would expect of ourselves, and that our patients would expect.

Most hospitals and health care organizations are starting to step up to the idea of individual accountability, but in very haphazard ways. For instance, I can lose my hospital privileges if I fail to sign a dictated discharge summary or operative note. But if I don't clean my hands for the next 10 years, nothing will happen to me.

One of the fundamental problems of safety is embedded in this example. We operate in an environment where there are regulatory sticks and payment incentives; and in this particular example, it's difficult to submit to an insurer if the doctor hasn't signed off. When there's money at stake, organizations get motivated enough to stop being too fuzzy.

Promoting safety — really doing it right — takes time and money. Ethics and professionalism are important but not enough.

Q. Do you think the safety movement has eroded trust between patients and doctors?

A. It has eroded trust in safety, but I think that was absolutely necessary. The idea from the I.O.M. report that launched this field was that there was a jumbo jet's worth of people dying every day.

The only way we are going to fix this problem is to become much more open and transparent. That transparency will drive us to improve and allows us to educate each other.

I really do believe that most doctors, nurses and administrators are good people, but it takes hard work and a lot of time to improve patient safety. We need to figure out what milieu will allow people to focus on safety and quality in the way that they need to. And I don't see how we can get to that stage if people don't have the appropriate level of concern.

Q. Has this erosion of trust had a detrimental effect on the patient-doctor relationship?

A. The chaos of everyone doing things their own way is incredibly dangerous, and it is that chaos which gets in the way of the relationship. You can make health care better, safer and less expensive while strengthening the core of the patient-doctor relationship. You can standardize certain parts of care based on clear evidence, which will free up doctors to focus on those pieces of the health care puzzle where there is no data — those issues that are uniquely human and that require judgment, expertise and empathy.

The challenge, though, is to standardize care in a way that will improve safety while retaining the parts that make medicine human. The last thing we want to do is to regiment empathy or to create something so regulated that doctors cannot do something nuanced or innovative for patients.

Q. What are the roles of patients and of doctors in the patient safety movement?

A. If I were a patient or a loved one, I would do what everyone recommends — have a loved one by your side, look for signals that a hospital is safe, check that a physician is board certified. But I am also intensely ambivalent about how responsible patients should be for safety and the prevention of error. Medical mistakes are our bad. Why should patients bear the responsibility to receive the right medication or to have the correct leg amputated? When I get on a plane, I don't worry about safety and errors.

As for doctors, patient safety can't happen if physicians aren't smack in the middle of it. We can either facilitate safety or we can stand its way. We will stand in its way if we embrace our historical approach to these problems, if we instinctively engage in finger-pointing, if we aren't willing to listen to others.

We have a huge role in creating the kind of environment where people will feel comfortable questioning anything that seems strange or out-of-place and where doctors are open to different opinions from others.

As doctors, we have to admit first that we don't deliver care that is of the quality and safety our patients deserve. Then we have to get past our professional arrogance. We don't have the answers to all of these issues, and we have to be open to others who may have the answers or who can approach it from different angles.

http://www.nytimes.com/2009/12/17/health/17chen.html?ref=health

Exam-Room Rules: What's in a Name?
By ANNE MARIE VALINOTI, M.D.

A patient of mine is a dental hygienist in her late 50s who works in her son's dental practice. On her first day of work, she told me, her son asked her to call him "Doctor."

And, he asked, "Is it O.K. if I call you 'Barbara'?"

Sure, she told him. They set to work on the first patient, and after she handed her son an instrument he needed, he graciously said, "Thanks, Mom."

This got me thinking of how, in my own career, I have always been addressed as "Dr. Valinoti." Freshly minted M.D.'s, some as young as 25, get a title of respect while seasoned nurses in the hospital are Betty, Kaye or Nancy.

I remembered the absurdity of this situation when, as an intern, I was addressing critical care nurses with decades of experience by their first names while they deferentially called me "Doctor." These were women who had started their careers when I was still playing with Barbie dolls, yet where were their professional titles? Like most things in medical training, I got used to it, and it became second nature.

One thing I am still getting used to, though, is when patients call me by my first name. There seems to be a void in this area of etiquette: How does one address one's physician? It is almost always an older patient who will use my first name, in a friendly, offhand way. And, I have observed, these patients are usually men. It might seem natural if I have had a long-term relationship with these people, caring for them over the years, but often these patients seem to make a decision at the outset to be on a first-name basis with me. I wonder about these people. Are they trying to be chummy? Is it a power thing, making them feel less vulnerable while they sit half naked on the exam table? Do they just call everyone by their first names?

At first I thought that perhaps this was a phenomenon particular to female physicians. For example, a colleague with whom I worked was a distinguished physician in the community, yet, she said with a sigh, "All my patients call me 'Sally.' " Clearly, she did not insist on this with her patients; it had just evolved.

But the male physicians in my practice have described the same situation. I remember being on call for the practice one night and speaking to a patient of another physician in my group. She went on in detail about the tests and treatment she was receiving from Adam, her doctor. After the conversation, I assumed that she was his personal friend.

"No," he told me the next day. "I really just only met her."

Regardless of whether I am “Anne Marie” or “Dr. Valinoti” to a patient, I rarely call a patient by his or her first name. As a rule, patients who are my senior are always “Mr./Ms./Dr.” Patients I meet for the first time are always addressed by their title, even teenagers (it seems silly, I know). Although many patients introduce themselves by their first name, I would never presume to address them as such without their specific permission. And even then, frankly, I find it hard to call a man old enough to be my father “Frank” or “Jim.” It is akin to my habit of still addressing old friends of my parents by their formal titles.

A study published in The British Medical Journal looked at the question of patient preferences regarding how doctors address them. Interestingly, most patients surveyed, particularly those younger than 65, preferred that their physicians call them by their first name.

But doctors do this at their own peril. A physician friend of mine experienced this firsthand when he made the mistake of calling a woman of a certain age by her first name during a visit. “That’s Mrs. White, thank you,” she told him, icily.

“I never forgot that one,” he said, remembering how he sheepishly finished her exam.

It is helpful for me to think about the doctor-patient relationship from time to time, especially in terms of how my patients and I communicate. The importance of effective communication in that setting cannot be overemphasized. Accurate diagnosis and treatment of medical ailments depend on the doctor’s clear understanding of the entire person who sits before her. A good internist will recognize dozens of subtleties during a simple face-to-face interview — subtleties that cannot be detected by the most sophisticated and expensive scans.

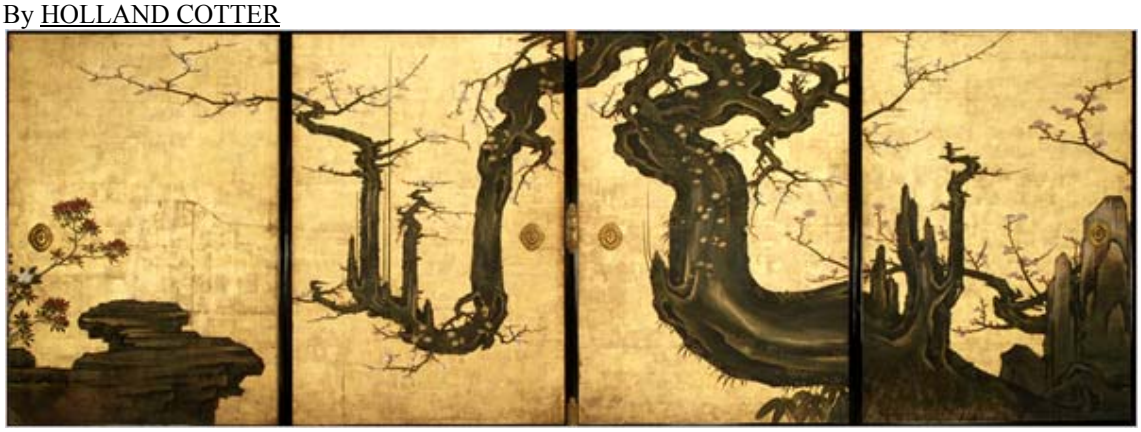
As medical costs climb skyward in our country, there is growing recognition that excellent primary care might be the foundation of a more accessible, affordable health care system. Great primary care doctors are, by necessity, great communicators. And, let’s face it: all communication starts with what we call one another.

Dr. Anne Marie Valinoti is an internist in northern New Jersey.

http://www.nytimes.com/2009/12/15/health/15case.html?ref=health

'5,000 Years of Japanese Art'
Cleaning Out Closets, Reuniting Old Friends

By HOLLAND COTTER



In these cash-crunching days museums are raiding their closets for shows and pulling out some terribly glamorous inventory. This is how the Metropolitan Museum of Art came up with "5,000 Years of Japanese Art: Treasures From the Packard Collection," a survey of exceptional material, some of which has been in and out of storage since its arrival in town nearly 35 years ago.

To anyone who frequents the Japanese wing, some of the objects will be old friends. Two Buddhist wood guardian figures, as pumped up and pugnacious as SmackDown stars, are in the same spot they've occupied since the galleries opened in 1987. So is the 17th-century screen painting "The Old Plum" by Kano Sansetsu, a flagship presence in the museum's globalist roster back in place after a recent trip to Japan.

Certain other items, however, like scroll paintings on silk have been exhibited only sporadically. At least one spectacular six-panel screen is making its public debut with the show. And a textile piece is taking what is likely to be its final bow before a long — possibly a generation long — retirement.

The Packard collection of more than 400 objects landed at the Met, with a bump, in 1975. When the news got out that the museum's director, Thomas A. Hoving, had acquired it, in a half-gift, half-purchase arrangement, for $5.1 million, hysteria ensued.

The purchase was the museum's most expensive up to that time. The country was in a recession, the city on the verge of bankruptcy. Who, some people asked, was familiar enough with Japanese art to know what we were really getting with this stuff?

Harry G. C. Packard knew. He started learning about Japanese art in 1946, as a Navy officer in Tokyo with the United States occupation forces. Although trained as a civil engineer, on his return home he went to graduate school in art history, then headed back to Japan for hands-on study. He was almost 40 and had already begun buying Japanese art in bulk — prints at first, then older things — and selling some of it (the collector Avery Brundage was a client and friend) but keeping choice items for himself.

As with late-19th-century Americans who assembled the great Japanese holdings in the Museum of Fine Arts, Boston, time was on his side. Japan was enmeshed in political and cultural upheaval. Art was on no one's mind, so it was available and cheap.

Mr. Packard learned about it as he bought, and bought as he learned. Long before his death in 1991 he had compiled the largest Japanese collection in America, its contents dating from the Neolithic period to the 20th century.

The Met show, organized by Sinead Kehoe, an assistant curator of Japanese art, starts somewhere between the fifth and first millennium B.C., when Japan was remote from continental influences. An early island culture known as Jomon was producing wafer-thin body ornaments from animal bone, though their masterworks, to our eyes, are earthenware vessels with snakeskinlike textures and flanged lips with the wavy contours of aquatic plants.

The taste for abstracted organic forms is fundamental to the art of Japan, from Jomon pots to haniwa — hollow clay tomb sculptures of doll-like soldiers and tender beasts — from the 5th and 6th century A.D. to the fleshy, fungal shapes of stoneware jars and bowls revered by 16th-century tea ceremony devotees.

Contact with Korea and China brought a different aesthetic ideal, evident in Buddhist art. In a 13th-century Japanese hanging scroll, Kannon, the bodhisattva of mercy, glows slender and white, like a night-blooming flower. In another painting the Buddha himself descends to earth on a path of light to comfort a dying man and carries his soul to heaven like an infant in his arms.

Ming-period China provided the direct prototype for the small-format six-panel screen called “One Hundred Boys” by the 17th-century Japanese artist, Kano Eino. (One of show’s few non-Packard inclusions, it was acquired by the Met this year.) But Chinese models were often radically altered in translation. “The Old Plum,” painted by Kano Eino’s father, invests the Chinese-derived landscape motif of an ancient tree budding into fresh life with a sense of monstrous violence, as if nature were a force to fear rather than simply contemplate.

Japanese art doesn’t tiptoe around big emotions like fury, erotic passion, grief and ecstasy. It revels in depictions of vengeful ghosts, unabashedly sensual women and nature as an emblem of personal heartbreak. A pretty little garden painting of birds and hibiscus flowers by Tsubaki Chinzan turns out to be imbedded with references to the Tang dynasty poem “Song of Everlasting Sorrow,” in which a hibiscus reminds a lover of his dead mistress’s face.

And image after image of the natural world seems to have regret built in. We walk past the 16th-century screens called “Bamboo in the Four Seasons” by Tosa Mitsunobu, and a year speeds by, as slender spring shoots turn into dark summer stalks, and autumn trees are suddenly bending under winter snow.

And surely few visions of the world as a passing mirage can be subtler than the one suggested in a bamboo painting by the poet-artist Gion Nankai done directly on the surface of a white, silk satin robe. The trees are solid upright when the robe is laid flat; but when it was worn, they would have broken into rippling fragments, like reflections in water.

Commissioned by a friend of the artist as a gift for a mistress, the robe was preserved as a family heirloom and brought out now and then as bridal attire. Its re-emergings may be now at an end. So light-sensitive is the silk that the robe, from the early 18th century, is rarely shown, and may not be again once the show comes down.

Not all the Packard material is so fragile, and the Met installation winds down with hardier things. On the religious side there are rough-and-ready votive paintings of fantastical animals. Inscribed with requests for divine blessings, these vicious examples of popular art were left in Shinto shrines, a practice that continues today.

Spiritual and secular can be hard to sort out in a culture which holds so much of the real world in of reverence. So you can read what you will into two 19th-century scrolls fly-specked with bits of verse and sketches of fall flowers.

The scrolls were the equivalent of guest books passed around at parties for artists and poets, with the expectation that everyone would add something, if only a name. And the names are impressive: the painter Sakai Hoitsu signed one scroll, the printmaker Kitagawa Utamaro, the other.

Parties meant meals; meals meant dishes. The Packard collection has many: porcelain cups that bring to mind Fiestaware; platters brushed with Picassoid heads and twisty trees. An Oribe ware food tray, asparagus-green and shaped like a fan, will tickle connoisseurs of ceramics.

And fans of fan painting will adore the single example by Ike Gyokuran, one of the show's few female artists, whose diminutive hand-held landscapes were such a hit that she painted the same ones over and over.

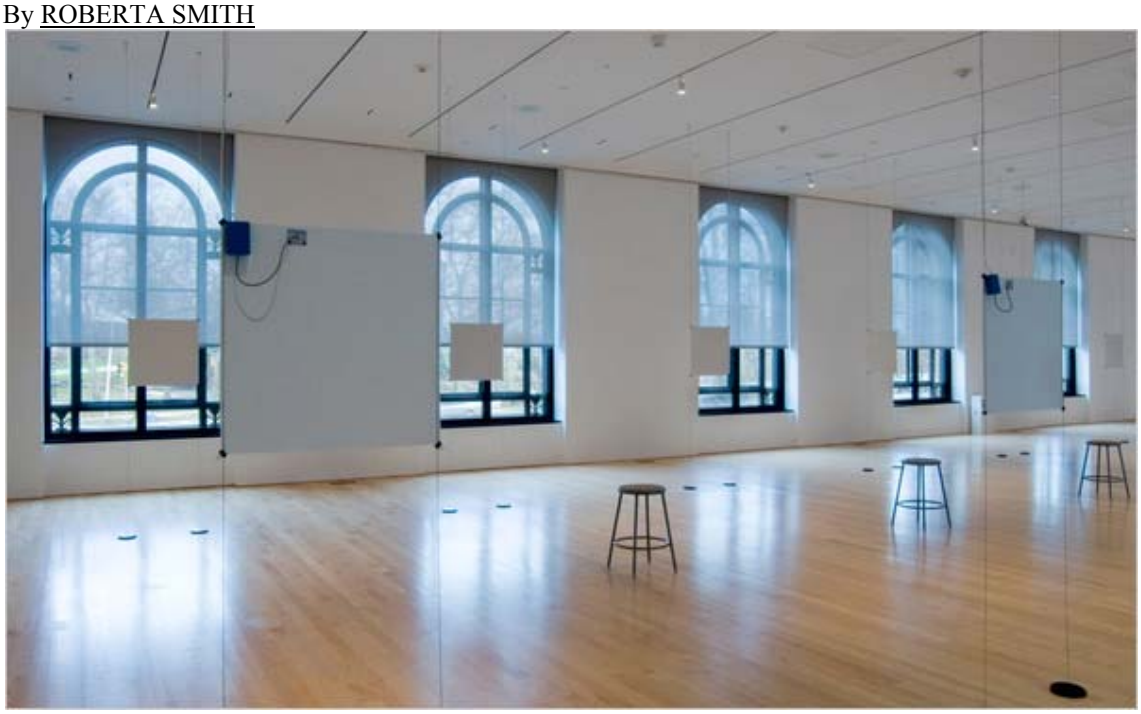
And in a sense, over and over is the story of Japanese art, and of this show. Flowers spill over many surfaces. Birds, mists and bodhisattvas drift across skies. Spring comes, then summer, then autumn, then snow sifts over bamboo. Art appears, it disappears; it appears again if we're lucky.

At the Met, with its wide halls and deep storage, we are.

"5,000 Years of Japanese Art: Treasures From the Packard Collection" remains through June 6 at the Metropolitan Museum of Art, Fifth Avenue at 82nd Street; metmuseum.org.

http://www.nytimes.com/2009/12/18/arts/design/18packard.html?ref=design

Bruce Nauman
Listen: Can You Hear the Space?
By ROBERTA SMITH



PHILADELPHIA — Radical art comes from the young, or so it would seem. Few artists persist in making us rethink what art can be late into long careers. But Bruce Nauman, 68, does.

Even after four and a half decades, Mr. Nauman still turns out videos, sculptures, installation works and sound pieces that tend to be stripped to the bone, no-frills, unfamiliar and even alien in form. They don't "present" as art, yet they lodge in the mind and won't let go, disorienting, irritating, inundating and exhilarating the senses. And with time, the best Naumans make clear their art-ness, laying bare life's basic experiences, distilled and compressed. They do this profoundly yet, it seems, inadvertently, as if Mr. Nauman were simply providing raw material that we absorb and fashion into art in our heads.

These conditions prevail at the Philadelphia Museum of Art, in the exhibition of "Days" and "Giorni," two large, enveloping sound installations created by Mr. Nauman for the 2009 Venice Biennale. They are accidental choral works, reflective of Mr. Nauman's interest in John Cage's ideas about chance, it would seem, but also of the repeating musical structures of Philip Glass. Each consists of recordings of seven people reciting the days of the week and the equipment necessary to make them heard, either in English ("Days") or Italian ("Giorni"). Both create corridors of sound and deliver epiphanies about time, space and humanity.

"Days" and "Giorni" formed the centerpiece of a 33-work mini-survey of Mr. Nauman's art that represented the United States in Venice. The exhibition was sponsored by the Philadelphia Museum and organized by Carlos Basualdo, its curator of contemporary art, and it received the Golden Lion for the best national participation. As well it should have. There wasn't much competition, and the American display had much more real estate than any other. The Nauman works carried over to two good-size spaces outside the Biennale.

One was the Ca' Foscari, an elegant old palazzo, where the assembled works included "Giorni," installed in a salon with a view of the Grand Canal. The other was the University of Venice at Tolentini, where additional Naumans culminated in "Days," displayed in another long, narrow salon, this one with rows of windows on both sides.

Seeing "Days" and "Giorni" in Philadelphia is tantamount to seeing them anew, in a clearer and more striking encounter. They are still separated, but in reverse order. "Days" is in the main museum and generally seen first. "Giorni" is across the Benjamin Franklin Parkway in the museum's Perelman Building, a short shuttle ride away. To complete the reversal, "Giorni" occupies a large, regal gallery with long rows of windows on two sides, as "Days" did in Venice.

But "Days" and "Giorni" feel different mainly because they are largely unattended by the sights and sounds of other Nauman works, even though three early videos and a neon piece are on view nearby in the main museum. Isolation makes them more stark and austere, but also more complex. They saturate the mind and senses more completely and reveal contrasts that were barely discernible in Venice.

Again, each piece consists of 14 recordings of seven people reciting the days of the week. Their voices are broadcast from 14 wafer-thin white speakers, around 23 inches square, arranged in seven facing pairs, one for each person's voice. Each speaker is simply clipped to two wires strung tautly from floor to ceiling. It's like paintings by Robert Ryman hanging on Fred Sandback's string sculptures, and the effect is magical. Phalanxes of levitating white squares emitting worlds of sound aren't something you see and hear every day.

Six stools scattered between the rows of speakers invite you to sit, listen and figure things out. It is quickly apparent that the voices are always slightly out of sync, and sometimes even saying different days, so that the echoing segues into contrapuntal Ping-Pong. But that is only the beginning.

"Days" has a dizzying hum-of-the-universe buzz at first. It's almost musical. Someone in the crowd seems to be singing the days rather than reciting them. As you move among the rows, you make out various female and male voices speaking at slightly different speeds, and sense different ages and personalities. The fastest speaker is a young boy in the middle, perhaps the source of the singing sound. At one end, a male voice has a gravelly Kirk Douglas roughness, as if the piece were a kind of life cycle.

The sound is incessant, but always changing. The days are recited in units separated by pauses — all seven days, a smattering of days, or just one — as if they were measuring time passing at different speeds. Standing between a pair of speakers with the same voice bombarding each ear is like hearing someone who is "of two minds." The voices dwindle to one pair reciting single days, but after this they all join in again, immersing the gallery and everyone in it in sound that seeps into adjoining rooms.

"Days" never stops and doesn't repeat: the recordings are different lengths and operate independently. But "Giorni" is a programmed loop of about 14 minutes, followed by a substantial pause. It is much more porous, as much about silence as about sound. The rich Italian voices are not so individual, perhaps because there is no child's voice, but each gets more air time.

At certain points the voices thin out. Several speakers on one side of the gallery fall silent as their partners keep going, then they reverse, and finally the group dwindles to a single voice, after which comes the pause, and the gallery rings with silence. Sound fills space in a much more precarious, unsettling manner.

Mr. Nauman is a realist working directly from life, isolating one readymade, obvious aspect of it at a time, and retooling it into something both grand and mundane that forms a strange, disorienting world unto itself. The Philadelphia Museum owns Mr. Nauman's earliest, best-known neon piece, which now hangs in a gallery near "Days." It is a lighted spiral that says, "The true artist helps the world by revealing mystic truths." The words are typical deadpan Nauman, but revealing, as in laying bare, is what he does. And there is always something like the spiral that will get you every time.

"Bruce Nauman: Days and Giorni" continues through April 4 at the Philadelphia Museum of Art, Benjamin Franklin Parkway, Philadelphia; (215) 763-8100, philamuseum.org.

http://www.nytimes.com/2009/12/18/arts/design/18nauman.html?ref=design

John Singer Sargent
Before His Famous Portraits, Sargent Looked to the Sea
By KAREN ROSENBERG

WASHINGTON — John Singer Sargent may have crossed oceans, but he was hardly a marine painter. This expatriate American artist (1856-1925) will always be remembered for his portraits, which charmed and flattered Gilded Age arrivistes on both sides of the ocean.

So the theme of "Sargent and the Sea," in its final weeks at the Corcoran Gallery of Art here, intrigues. Did the well-born and even-tempered painter have a rugged nautical side, or nurture fantasies of roiled, Turneresque waters?

The truth, as gleaned from the show, isn't so shocking. Sargent took his keenest interest in the ocean during a formative period, when he was between the ages of 18 and 23 and traveled frequently for reasons both personal and professional.

Still, it's a different Sargent from the artist we know from the commissioned portraits and the bons mots of his friend Henry James. He was secure in his talent, even during these early years, but still seeking out the subjects that would ignite his career. He was also struggling to balance his academic training with the more intuitive, responsive discipline of plein-air painting.

Most of the time he was based in Paris, where he studied with the painter and teacher Carolus-Duran. Like other young artists of means, though, he spent summers in Brittany, Normandy and Capri. In these seaside locales he spent quality time with his family while scouting genre scenes appropriate for Salon exhibitions.

"Sargent and the Sea" includes some 80 works, of which just a handful are full-size paintings. It's anchored by the Corcoran's own "Setting Out to Fish" (1878), Sargent's painting of women and children gathering dinner along the coast of Cancale.

Sarah Cash, a curator of American art at the Corcoran, organized the exhibition with contributions from Richard Ormond (a Sargent scholar and grandnephew who is working on the artist's catalogue raisonné).

As Ms. Cash notes in her introduction to the substantial catalog, "Sargent and the Sea" evolved from a more modest idea for a show based on "Setting Out to Fish." In the course of planning, three early seascapes were discovered. The project also grew to include "Neapolitan Children Bathing" (1879), from the Clark Art Institute, as well as 1870s sketches from the Metropolitan Museum's John Singer Sargent scrapbook.

Although Sargent's family had been in shipping, he was several generations removed from the business. He was 21 when he made his first transatlantic voyage, from Liverpool to New York. This journey inspired the three seascapes discovered in 2003, on view in the first gallery, which show the view from the boat's deck at sunset in relatively placid conditions.

The stormy return trip gave rise to another, more violent seascape, "Atlantic Storm" (1876). Here you can see the boat's stern on the bottom edge of the canvas, its wake plunging over a precipitous ridge of water. The frothy wave crests anticipate the meringuelike whites of Sargent's later portraits.

This gallery of early seascapes makes Sargent out to be a brooding romantic, a Matthew Arnold, which he wasn't. His calm, methodical temperament starts to emerge in the next rooms, devoted to exacting studies of ship rigging, working sailors and beachcombers at Cancale.

Likewise the Corcoran's "Setting Out to Fish" is, for all its apparent spontaneity, a studio painting conceived and packaged for the Salon. Here it's surrounded by the separate preparatory drawings Sargent made for each of the figures grouped on the beach. Of particular interest are his drawings of mothers balancing children on their hips, a pose he studied to approximate the basket-bearing women of the painting.

Also here is a smaller companion piece, titled "Fishing for Oysters at Cancale" and made for a New York exhibition. The wall text explains that Sargent probably never witnessed any oyster-gathering; it was prohibited during the summer months. New York was in the midst of an oyster craze, however, and Sargent knew his audience.

Both paintings were well received, with critics praising Sargent's vigorous brushwork and command of atmospheric effects (particularly in the tidal pools that reflect the cloud-studded sky). They're still impressive for a painter in his early 20s, if a tad obsequious.

Having exhausted Cancale, Sargent spent part of the following summer on Capri, absorbing images of turquoise waters and tanned locals that would resonate back home as authentically Mediterranean. His efforts culminated in "Neapolitan Children Sunbathing," which he submitted to the National Academy of Design's annual exhibition in 1879.

In the painting two toddlers stand near the ocean; two older boys lie on the sand. One of the younger children wears a set of water wings made from animal bladders, a charming bit of realism that now reads as fantasy. The light is golden but glaring; the canvas looks as if it would feel hot to the touch.

To a contemporary viewer, this scene imports exoticism and sensuality in mildly alarming quantities. But the unusual composition, and sensitivity to children of varying age, prefigure Sargent's masterpiece "The Daughters of Edward Darley Boit."

Sargent the perpetual tourist eventually moved inland. In his watercolors after 1879, Moroccan casbahs and Venetian canals displace beaches. The final gallery includes a smattering of Whistler-influenced seascapes, but the sea comes to seem incidental. The Corcoran might have done better to call the show "Sargent Becoming Sargent."

That's fine, because this show is aimed at artists, not mariners. There's even an "inspiration gallery" with a still life of lanterns, nets and other salty accessories nestled against a sail. On a rainy Sunday afternoon the room was filled with people sketching.

"Sargent and the Sea" continues through Jan. 3 at the Corcoran Gallery of Art, 500 17th Street NW, Washington; (202) 639-1700, corcoran.org.

http://www.nytimes.com/2009/12/18/arts/design/18sargent.html?ref=design

In Washington, a Different Kind of Bubble

By NICOLAI OUROUSSOFF

I've never stepped onto the National Mall without feeling a mix of emotions — reverence, a flash of national solidarity, a feeling of loss — but pure delight has never been one of them.

That may soon change. For the last several months the newly appointed director of the Hirshhorn Museum and Sculpture Garden, Richard Koshalek, has been quietly at work on a plan to erect a 145-foot-tall inflatable meeting hall that would swell out of the top of the internal courtyard of the museum, which sits on the Mall midway between the White House and the Capitol.

Designed by the New York firm Diller Scofidio & Renfro, the translucent fabric structure, which would be installed twice a year, for May and October, and be packed away in storage the rest of the time, would transform one of the most somber buildings on the mall into a luminous pop landmark. It could be the most uplifting work of civic architecture built in the capital since I. M. Pei completed his East Building of the National Gallery of Art more than 30 years ago.

But it is what the project is intended to house, and to represent, that has the potential to shake up Washington. For decades government power brokers have dismissed much of contemporary culture as a playground for elites. Mr. Koshalek's vision would challenge that mentality by using performing arts, film series and conferences to foster a wide-ranging public debate on cultural values.

Mr. Koshalek, who is known for his bubbly enthusiasm, has been a champion of architectural causes since his days as the director of the Museum of Contemporary Art, Los Angeles, in the late 1990s, when he helped lead the drive to build the Walt Disney Concert Hall. Later he worked behind the scenes with the city's government agencies and cultural institutions to hire respected architects for their new buildings rather than the kind of politically connected firms that were then the norm.

He arrived at the Hirshhorn last April with a dual agenda: to raise the museum's national profile and to put Washington in closer touch with creative life around it. Within weeks he was promoting his vision to legislators, museum directors and foreign cultural attachés.

Yet the museum he took over offered its own set of challenges. Completed in 1974, the building was one of the last major projects designed by Gordon Bunshaft, a pillar of American postwar Modernism. Its gray, drum-shaped exterior, propped up on four massive concrete legs, has a bunker-like appearance that

seems to keep the city at a distance. The cylindrical courtyard, which is slightly off center in an obvious attempt to offset its formal purity, has the eerie stillness of a set from an Antonioni film.

And since the Hirshhorn is part of the Smithsonian Institution and stands on such sacred ground, any permanent addition would require the approval of the notoriously conservative Fine Arts Commission and the National Capital Planning Commission, a process that could take years.

The beauty of a temporary structure, Mr. Koshalek realized, is that he would only need to consult with the members of his own board. The budget would be around $5 million, a relatively paltry sum by the standards of recent museum expansions, even in today's rough economic climate. And the design's extreme flexibility — it can be blown up at a moment's notice, and the interior can be easily reconfigured — could allow the museum to respond nimbly to cultural issues of the moment. (Worst case, if it turned out that people hated it, it could be packed away forever.)

The architects imagine the installation process as a performance piece in itself, something like watching event organizers blow up the balloons for the Macy's Thanksgiving Day Parade. Two refrigerator-size air pumps would be used to inflate the baby-blue structure, which would fill the entire four-story courtyard and bulge out of the top. A smaller, globulelike form would swell out of the bottom of the building to create a public lounge overlooking the mall.

The aura of lightness — of a building that seems ready to float off into the sky — is counteracted by the structural systems that hold the addition in place. A gigantic tube of water, like an inner tube, encircles the interior of the structure to weigh it down. A series of big steel cables, tethered to the inner tube at one end and to a roof-level truss at the other, would wrap several times around the translucent form as it rises through the core of the building, making it resemble an uneven stack of donuts or an act of ritual bondage.

Most visitors would enter the structure through a short, tube-shaped corridor located at the seam between the lounge and the main courtyard space. In the current version of the design, which is still being refined, the lounge's translucent blue skin becomes progressively more transparent at the base, so that visitors will be able to see out into the mall. The inner tube that would anchor this room's outer edge serves as an informal bench.

The main hall, by contrast, would be slightly more formal. A temporary stage would be built over the courtyard's off-center fountain, with up to 1,000 seats arranged in a semicircle around it. Further up, a few transparent areas in the fabric would allow visitors occasional views of people up in the galleries. (Given the height of the interior, the architects might consider adding one or two levels of balcony space, which would add richness to the design and take advantage of what is now a four-story-tall void.)

Will Mr. Koshalek's vision succeed? It's too soon to say. The project could become something Washington has never had: a real democratic forum for the debate of cultural issues as varied as, say, Hollywood morals and the impact of fundamentalism on the arts. It could also, of course, become a political punching bag.The structure itself, if it is ever built, will be part of a long tradition of architects seeking to tap into the energy and accessibility of popular culture. It includes projects like Archigram's 1969 Instant City, which was partly inspired by the cheap, ethereal structures of postwar Los Angeles, and Peter Cook's 1968 Ideas Circus, an informal think tank enclosed underneath a big dome that could be packed up in trucks and moved from city to city.Like those earlier models, the Hirshhorn project is informal, egalitarian and free of conventional hierarchies. It aims to provide an elastic framework for a more inclusive culture, one that is in a continual process of reinvention.

At a time when Washington is focused on practical issues of survival, from health care to the war in Afghanistan, it would also provide a sanctuary for speculating on the nature of the civilization we are building.

http://www.nytimes.com/2009/12/15/arts/design/15hirshhorn.html?ref=design

Gabriel Orozco
Slicing a Car, Fusing Bicycles and Turning Ideas Into Art

By HOLLAND COTTER

Gabriel Orozco's 1993 solo debut at the Museum of Modern Art was a barely there, very un-MoMA affair of a few photographs, a ball of clay, a hammock and some fresh fruit. His one-man show at Marian Goodman the next year was sparser still, with four plastic Dannon yogurt lids nailed to the walls of the gallery's otherwise empty big front space.

Mr. Orozco got instant mileage out of thinking light. He was tapped by museums in Chicago, Paris, Berlin, Amsterdam and Mexico City, where he grew up. He became an object of admiring critical scrutiny, and a hero to many young artists, especially in his home country. In 2000 the Museum of Contemporary Art in Los Angeles organized a traveling career retrospective, and now at 47 he's getting another one, called "Gabriel Orozco," at MoMA.

He has, in short, received a degree of intense and sustained attention that relatively few artists, young or old, ever get. Why? The question lingers, only half-answered, after seeing his retrospective, a taut, attractive, but oddly conventional looking survey, heavy on painting and sculpture.

At least part of the reason for his continuing appeal can still be traced to the memory of that charmed first MoMA show, and the young, footloose artist who produced it. Born in 1962, the child of a leftist mural painter and teacher, Mr. Orozco studied art in Mexico City and then left for Spain, Brazil and New York, in the process immersing himself in international culture.

He learned what he liked and didn't like. He was turned off by the big, expensive painting that defined a bloated 1980s market. He was attracted to the spare, idea-driven, Dada-inflected art of older figures like John Cage, Joseph Beuys and Piero Manzoni, and Brazilian conceptualists like Cildo Meireles and Lygia Clark.

Dodging commitments to mediums or styles, he took improvisation as his baseline method, and turned personal quirks into assets. Studios made him antsy, so he did without one. Instead he wandered, poked around, made art from what he found, often where he found it. Sometimes he created, added to or tweaked a situation. He photographed the results: a mist of warm breath on a dark wood surface; a pattern of circles traced by wet bicycle wheels; oranges, like little celestial bodies, placed, one per table, on a receding line of tables in a outdoor market.

Some of these photographs were in the 1993 MoMA show, along with the ball of soft clay that Mr. Orozco had rolled through Manhattan streets until it was black with grime. He hung the hammock in

MoMA's sculpture garden; anyone could use it. The fresh fruit? He arranged oranges in neat rows in apartment windows across the street from the museum. You looked up and there they were: bright dots connecting art and life.

It's useful to remember that this pixilated exhibition came just a few years after the stock market had bottomed out, pulling the art market down with it. A revulsion against 1980s materialism had set in, and many young artists were heading in the opposite direction. In addition, identity politics, simmering through the previous decade, had come into its own, and the appearance of Mr. Orozco, a young Mexican artist, at MoMA was a political event.

Even if his art wasn't directly shaped by any of these factors, it was a timely package. And this took a particularly succinct form in his contribution to the 1993 Venice Biennale: a single empty cardboard shoebox left on a gallery floor. This was a perfectly judged gesture: commanding in its modesty, vulnerable in its openness, and obliquely critical. Intended as a sly reference to the cramped exhibition quarters he'd been allotted, the piece might also be read as a comment on the scant room given to Latin American artists in history.

Gestures tend to lose some of their energy when they're repeated. The shoebox is in the MoMA survey, it's the first thing you see in the galleries. The dirty ball is there too. So are the yogurt lids, nailed to partition walls. But they feel archival.

The shock and delight of puzzlement, of seeing nothing turn into something before your eyes, are gone.

No one's to blame; this is the way certain art operates in time. But the consequence in this case is a show dominated by a different, more traditional aspect of Mr. Orozco's activity, namely his steady and increasing production of paintings, drawings, and sculptures, many — too many — of elaborate ingenuity.

The large early sculpture "La DS," made in Paris in 1993, is basically a ready-made à la Duchamp, but seriously altered. He cut a 1960s Citroën DS lengthwise into three slices. He extracted the center slice, which held the engine, and rejoined what was left to create a skinny, doofy-looking, nonrunning vehicle that accommodated one passenger in front, one in back. One of Mr. Orozco's best-known images, it has invited varied interpretations — it's about technology gone batty, about consumerism, about French national amour-propre. What it is is an audacious joke, a 3-D cartoon, not much more.

Mr. Orozco has since designed things of even more complicated cleverness, like a Ping-Pong table with a lily pond in the middle; a sculptural house incorporating pianos; an outsize chessboard in which all the pieces are black, white or brown knights; and four bicycles welded together and going nowhere fast. The MoMA organizers — Ann Temkin, chief curator of sculpture and painting, and Paulina Pobocha, a curatorial assistant — have passed on these cumbersome bagatelles, but have included two of Mr. Orozco's largest works.

One, "Mobile Matrix" (2006), is composed of an intact whale skeleton, its bones decorated with circular designs drawn in graphite. Suspended in midair in the MoMA atrium, it seems to have "Why?" written all over it. Yes, the Mexico City library that commissioned it had a large space to fill, as does MoMA. But Mr. Orozco's demonstrable — and wonderful — Zen-like gift is for doing much with little, not for providing architectural filler.

Filler is also the word for "Samurai Tree Invariants" (2006), a series of more than 600 digital prints representing all the possible permutations of the red-yellow-blue-black-white-gold palette used by Mr. Orozco in sleek abstract paintings. The prints, which cover four walls of a second-floor gallery like wallpaper, are in turn being used as templates for a new line of paintings being turned out, atelier-factory style, with Mr. Orozco involved long-distance, submitting designs by e-mail.

The colors and forms in these series suggest the utopian, total-environment spirit of early modernism. Mondrian comes to mind; so does the Bauhaus, as exemplified in another show now at the museum. But what is Mr. Orozco really up to? Is he mocking these models? Revisiting them, as many artists — refugees from postmodernism — are, with a sense of relief? Either way, seen in the context of his earlier art, the prints and paintings come across as the work of a former maverick turned mainstream player.

This impression is reinforced by the sheer volume of scholarly writing devoted to Mr. Orozco, including catalog essays by the scholars Benjamin H. D. Buchloh and Briony Fer, both of whom enshrine him in wordage. Possibly because he has been careful to distance his art from overt Mexicanness, he has become in some academic circles the canonical contemporary Latin American artist, in much the same way that William Kentridge, a white South African, has become the token African artist.

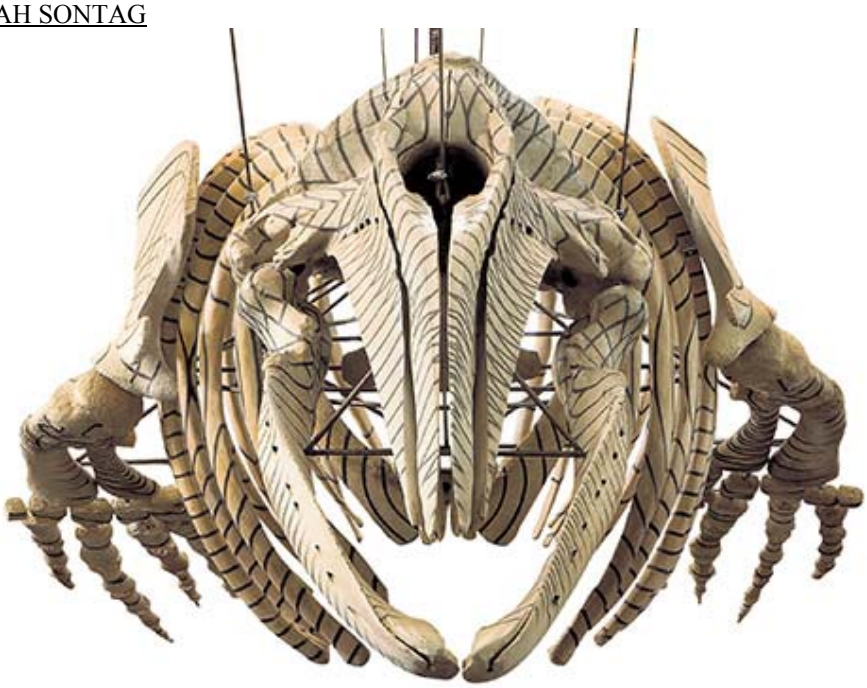
All of this is, of course, peripheral to the art, and Mr. Orozco's intelligent inventiveness is not in question.

The dozens of small sculptures set out on shelves and tables in the last gallery are proof. Some are sketchy or merely busy, but others do what Mr. Orozco has always done best: find the cosmic in the commonplace, sweeten abjection with wisdom and wit. And at some point he may decide which he really wants to be: the artist of poetic epiphanies or of institutional product. In this show he is both.

"Gabriel Orozco" continues through March 1 at the Museum of Modern Art; (212) 708-9400, moma.org.

http://www.nytimes.com/2009/12/14/arts/design/14orozco.html?ref=design

A Whale of a Return to MoMA
By DEBORAH SONTAG



SIXTEEN years ago the Museum of Modern Art granted a little-known Mexican artist his first solo show in the United States. Then 31, peripatetic and studio-less, the artist, Gabriel Orozco, who belonged to a new generation rebelling against the expensive manufactured art objects of the 1980s, endeavored to produce as fresh and serendipitous a museum exhibition as possible.

Rejecting the pristine gallery used by MoMA's Project Series for emerging artists, Mr. Orozco chose instead the museum's nooks and crannies: a space between escalators for a scroll of phone numbers, a corner of the sculpture garden for a hammock between trees. What many remember best about that small show was a whimsical piece not even in the museum itself: "Home Run," an arrangement of fresh oranges in the apartment and office windows across 54th Street.

Mr. Orozco's return to the museum, for a 20-year survey of his work that opens on Sunday, is quite different. It is as concrete as the first show was ephemeral, as planned as it was improvised and as splashy as it was quiet, with a mammoth, elaborately produced art object at its center: "Mobile Matrix," a whale skeleton excavated from the sands of Baja California, fitted onto a metal armature and intricately inscribed with graphite rings and circles by a team of 20 members who exhausted 6,000 mechanical pencil leads.

At 47 Mr. Orozco is no longer the footloose wanderer, toothbrush, notebook and camera in hand, who found poetry in puddles and dignity in debris, dung and dryer lint. Still experimenting with new materials — cactuses, most recently — and varying modes of expression, he is nonetheless far more rooted, some say far more conventional, than the young artist crashing at his girlfriend's New York University dorm room during his first MoMA show.

Now Mr. Orozco is a husband, father and international art star, with homes in Mexico, Paris and New York (an $8.8 million West Village town house next door to the model Gisele Bündchen's). Having been crowned "the leading conceptual and installation artist of his generation" by The New Yorker in 2001, who has more than three dozen works in the collections of MoMA, the Guggenheim and the Whitney, Mr. Orozco is at home too in the heart of the Manhattan art establishment. Although some believe that

success has eroded his idealism, he seems quite comfortable with the monumentalization that a midcareer retrospective at MoMA implies.

"I was never an idealist," he said in an interview at the museum. "I was not against the market. I was trying to understand the market. I was not against the object. I was trying to understand why we make objects. I was not even against painting itself when I stopped doing it. I was against the way that people were painting because I thought it was very boring."

In regard to the retrospective he said: "It's very important to look back, like a scientist who studies his experiments and sees what worked and what didn't. And then, of course, it's important to forget. And I am very good at that, forgetting."

During the installation of his exhibition in the kind of white-walled MoMA gallery that that he once spurned, Mr. Orozco, tousle haired and rumpled, received a visit from the museum's immaculately groomed director, Glenn D. Lowry, whose red silk tie matched his pocket square. "Hola!" Mr. Lowry said, sweeping into the nearly empty gallery, where just a few pieces had been uncrated. "Exciting, exciting."

Mr. Lowry made a beeline for "La DS," a well-polished silver Citroën sliced lengthwise and reassembled without the middle third. It is Mr. Orozco's signature work, a totemic French car remade in a Peugeot garage on the outskirts of Paris in 1993.

"The best, the best," Mr. Lowry said. "This is like one of my favorite works of art. It also looks so clean."

Mr. Lowry and Mr. Orozco inhaled the smell of the leather upholstery and discussed science fiction, the car's juxtaposition with a painting, and symmetry.

After Mr. Lowry left, Mr. Orozco said: "You see Glenn, how we spoke together? I don't feel it's like Mr. Institution coming — well, except for the way he dresses. But you see, we talk about the work. He's thinking about it. That has been my relationship with this museum since 1993."

In "Gabriel Orozco," the pieces displayed range from slight, ready-made items like "Empty Shoebox" (1993) through the singular "Black Kites" (1997), a human skull etched with a checkerboard design, to the monumental whale sculpture. That sculpture was commissioned in 2006 for the new megalibrary in Mexico City built by former President Vicente Fox, and some Mexicans criticized Mr. Orozco for providing "a centerpiece for the national cultural white elephant," as Cuauhtémoc Medina, an art critic, curator and historian, put it in an phone interview from Mexico.

The MoMA retrospective also includes, from the last few years, some geometric abstract paintings, which some admirers of the artist do not like, considering the very idea of Mr. Orozco painting — much less prettily, with tempera and gold leaf — to be a betrayal of his early abandonment of the form.

"It's astounding to realize that when he first made those paintings, they were pretty much universally panned among his loyal devotees," said Ann Temkin, MoMA's chief curator of painting and sculpture, who organized the retrospective. "They were like, 'Is this just a complete cop-out?' I myself am not so cynical as to say he began making paintings because there would be customers."

Still, Mr. Orozco likes to disappoint; it is almost a credo of his. "I want to disappoint the expectations of the one who waits to be amazed," he has said.

Similarly, he does not like to be categorized or pinned down. "I don't like to be so definitive about myself," he said. He works in many mediums, from sculpture and installations to photographs and drawings. And because he emerged when the art world was beginning to globalize, Mr. Orozco is a "deliberate internationalist," Ms. Temkin said.

That makes Mr. Orozco's relationship with Mexico complex. He eschews labels like "Mexican artist," yet "without doubt, Orozco is Mexico's best-known living artist," Carmen Boullosa, a Mexican poet, novelist and playwright, wrote in Bomb Magazine in 2007. And his homeland government certainly claims him.

When the Museum of Modern Art was negotiating with Mexico for the loan of "Mobile Matrix," which required special permits for the temporary export of a protected animal considered a national treasure, nationalist pride factored into the transaction. Mexico's cultural council, in a news release, declared that the Orozco retrospective was especially important because MoMA had not dedicated a solo show to a living Mexican artist since Diego Rivera in 1931-32.

In critical views like Mr. Medina's, this news release shows what he calls a tragic mutual dependence between MoMA and the Mexican government, both of whom, he said, are using Mr. Orozco. "It is problematic," he said, "how Orozco has accepted and promoted the role of being the most important Mexican artist since the muralists."

Born in Xalapa in 1962, Mr. Orozco grew up surrounded by muralists and other politically engaged artists and intellectuals. When he was 6, his father, Mario Orozco Rivera, a painter and outspoken Communist, moved the family to Mexico City so that he could work with the muralist David Siqueiros. The elder Mr. Orozco was often assumed to be a descendant of José Clemente Orozco, but Gabriel Orozco said that his father was not related to that muralist — or to Diego Rivera.

"I prefer not to even talk about that so much," Mr. Orozco said. "In my case I'm not a muralist or anything."

The muralists made monumental public art that dealt frontally with Mexican history and identity. Mr. Orozco, on the other hand, was interested in a more individual, quotidian, "human-scale" exploration of his universe, he said. Unlike some other Mexican artists who came of age in the 1980s, "I never played with Mexicanness at all in my work," he said. For more than a decade he even abandoned painting, the predominant medium of 20th-century Mexican art, which he had studied at the National School of Plastic Arts.

Mr. Orozco found the fine arts academy parochial. He preferred to venture out on his own, exploring mediums like photography that he was not studying formally. After the 1985 earthquake, he wandered the ravaged Mexican capital with a camera, and his wandering continued when he moved to Spain to continue his studies. He roamed Madrid making, and then abandoning, on-site sculptures from scavenged materials. Returning to Mexico, he nurtured a group of other exploratory artists, including Damián Ortega, in a workshop at his home, but he considered Mexico "hostile to my work."

"Many people" — including his father, he said — "thought what I was doing was just arrogant, frivolous, silly."

In 1992 two of his works — "Recaptured Nature," a large balloon made from inner-tube truck tires, and "My Hands Are My Heart," a lump of terra-cotta clay squeezed into the shape of a human heart — were included in a sweeping Latin American art exhibition at a museum in Antwerp, Belgium. This provided Mr. Orozco with international recognition just as he was moving to New York with Maria Gutiérrez, his girlfriend, who was studying at N.Y.U. (She is now his wife and an expert on climate change for the United Nations.)

Not long after he arrived, Mr. Orozco met with Marian Goodman, the prominent gallery owner, at a coffee shop near N.Y.U. She had agreed to the meeting as a favor to an art historian friend. Mr. Orozco brought slides, Ms. Goodman said, of "beautiful, now iconic, photographs of things he put together with objects on the street," including one, especially striking to her, featuring the "arabesques made on wet pavement" by the tracks of his bicycle through a puddle.

"I think it was the best meeting I'd ever had with a young artist," Ms. Goodman said. "He was very bright, very observant and clearly somebody who had something new to say."

In 1993, the year that he created "La DS," when he was also experimenting with sculptural globes of plasticine and inked circles atop toothpaste spit on graph paper, Mr. Orozco's career took off with multiple exhibitions. Among them was one that Ms. Goodman arranged at the Venice Biennale, where he showed "Empty Shoebox," an open cardboard box left on the floor to be kicked about. "It shocked everybody," Ms. Goodman said. "He has a lot of courage in what he does and can be quite radical."

In a similar spirit the MoMA show followed, and then an exhibition at Ms. Goodman's gallery in which Mr. Orozco, in "Yogurt Caps," pinned four transparent Dannon yogurt lids to the walls of a bare room.

At that point, after the crash of the 1980s art-market boom, Ms. Temkin said, there was "a real disgust with art that looked expensive and monumental." This created a particular receptivity for, as Mr. Orozco put it, "a young rebel from abroad" who, reacting against what he called the 1980s' decadence, was experimenting with understatement.

"His effortlessness had such a magic to it," Ms. Temkin said.

In subsequent years Mr. Orozco, moving between the United States and Europe, producing Dumpster-inspired art as well as polished, Dada-esque versions of games like chess, table tennis and billiards, seemed suddenly ubiquitous, Michael Kimmelman said in a 1998 review for The New York Times. Mr. Kimmelman said that he had initially wondered whether Mr. Orozco's work was too slight but came to believe it capable of a profound effect on viewers.

"La DS," Mr. Kimmelman said, made people focus on the space cut out of the car. And, thinking back, "I'd now say that the yogurt caps were calculated to cause a similar effect by making people uncomfortably aware of the gallery's emptiness," he added. "The installation was about the psychological gap between what we expected or hoped to see and what we did see."

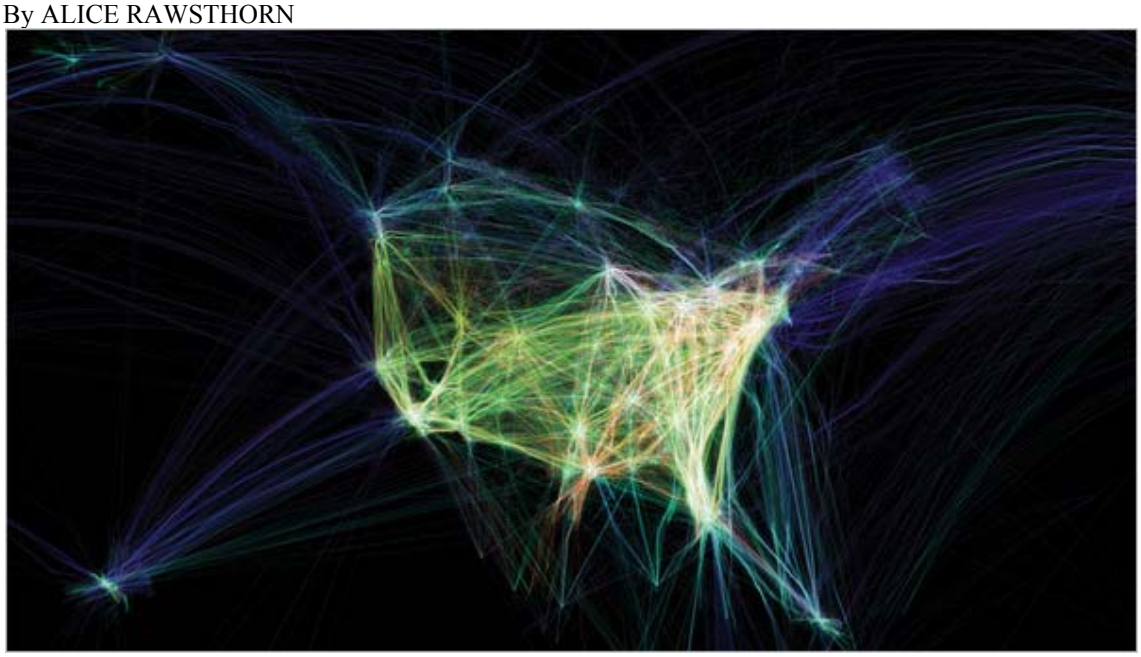
In planning the MoMA retrospective, Mr. Orozco, who has recorded his artistic journey in neat block letters in notebooks over the last 17 years, chose not to reprise "Home Run," the oranges installation. This initially surprised Ms. Temkin, but she came to appreciate that the piece's original "spirit of spontaneity" could not be recaptured if it were presented as "Here's a masterpiece."

Midcareer retrospectives, by summing up an artist, can be premature and, for some, creatively paralyzing. For an artist like Mr. Orozco, who said he "gets bored easily" and continually aspires to reinvent himself, one challenge of success is to remain free of encumbrances.

"I don't like a big enterprise of people working for me," he said. "I don't want to be a master. I want to be a kid. To keep making art, you have to put yourself in the position of a beginner. You have to be excited by a stone on the sidewalk or, like a child, the flight of a bird."

http://www.nytimes.com/2009/12/13/arts/design/13orozco.html?ref=design

London Portrays Past and Future of Digital Art
By ALICE RAWSTHORN



When the security guards first spotted a kid working on the computers in a laboratory at Liverpool John Moores University in the late 1980s, they demanded to know what he was doing there. He explained that one of the teachers had given him permission to hone his programming skills on the machines.

Good call. Daniel Brown, now 32, is one of the world's leading digital designers whose latest work, a luscious replica of tropical greenery, marks the entrance to "Decode: Digital Design Sensations," an exhibition of digital art and design that opened Tuesday at the Victoria & Albert Museum in London. Equally spectacular pieces by other designers are featured in the show, as well as dazzling examples of data visualization, the new medium that translates complex information into gorgeous — and easily understandable — digital images.

A short walk along the V&A's corridors, a smaller exhibition shows how far, and how fast, these technologies have come. "Digital Pioneers" is a selection from the museum's collection of early computer-generated imagery produced from the 1950s onward by the forerunners of the "Decode" designers, including Mr. Brown's father, Paul, who was experimenting with computer art years before his son started sneaking into the local university lab. Compellingly simple and made with rudimentary technology, much of the work in "Digital Pioneers" is astonishingly beautiful and seems both brave and prescient given the extreme sophistication of "Decode."

At a time when more and more of the images we see every day are digital, "Decode" and "Digital Pioneers" offer a welcome opportunity to help us understand how this area of design has developed, and is likely to evolve in future. "For the last 10 or 15 years this has been a very geeky field, but now more and more people are aware of the technology, and of how digital imagery is encroaching upon their lives," said Shane Walter, creative director of the digital art and design festival, onedotzero, and co-curator of "Decode."

This area has been so geeky that the first examples of computer art to be acquired by the V&A — a series of lithographs produced for "Cybernetic Serendipity," a groundbreaking 1969 exhibition at the Institute of Contemporary Art in London — were originally classified as "prints" by the museum's curators. The V&A has now recategorized them and acquired more work to create one of the world's largest archives of digital art and design.

"Digital Pioneers" draws on that collection. The story begins in the 1950s when computers, restricted up to then for military use, were introduced to universities and laboratories. Mathematicians and scientists started to experiment by using them to create graphic effects, as did artists and designers. Typical is the earliest piece in the show, a 1952 photograph by Ben Laposky of electronic waves flickering across a screen.

During the 1960s, Herbert Franke and Frieder Nake developed sparse geometric images by sending instructions from computers to simple printers or plotters, machines with mechanical arms to guide a pen across a screen or paper. Artists, like Charles Csuri, then devised ways of introducing random elements to the process. By the 1970s, Harold Cohen, Roman Verotsko and the elder Mr. Brown had become so adept at working with computers that they were writing their own programs.

Many of the "Digital Pioneers" were women, including Lillian Schwartz, Vera Molnar and, later, Barbara Nessim. They may have been drawn to computer art as a new medium with fewer barriers to entry than established areas of the visual arts or technology, where women were less prominent at the time.

The exhibition ends at the turn of the 1980s with the introduction of paint programs, which simulate the traditional effects of brushes and pencils as they produce paintings and drawings. "Earlier artists, like Harold Cohen, devoted their lives to working directly with the machine without any intermediate software by writing their own computer programs to produce drawings," said Douglas Dodds, the V&A senior curator responsible for the show. "Paint programs enabled the new generation to produce work without having to understand the underlying technology."

Assembling an exhibition solely from its collection has prevented the V&A from presenting a comprehensive history of digital art and design. There are obvious omissions, like the work of Muriel Cooper and Ron MacNeil at the Massachusetts Institute of Technology's Visible Language Workshop in the 1970s. Even so, "Digital Pioneers" is an intriguing prelude to the visual extravaganza of "Decode."

Renowned for its historic collections of the decorative arts, the V&A sometimes stumbles when it encounters the contemporary, but "'Decode" is a happy exception. All of the exhibits were made in the last five years, at a time when digital art and design have become more aesthetically refined and intellectually challenging. "Many of the projects are post-digital, less about fetishizing technology, and more about the ideas they are expressing," said Mr. Walter.

The first section of the exhibition shows how programmers, like Mr. Brown, and his American peers, John Maeda, Casey Reas and Joshua Davis, treat the raw data of computer code just like other craftsmen work with their chosen materials, by transforming it into something that looks lusciously seductive.

"Interactivity" explores the immersive potential of technology. You can "splash" paint across a screen by waving your arms in front of Mehmet Akten's Body Paint installation, or watch the branches of Simon Heidjens's digital trees move whenever the wind blows outside the V&A. These projects offer a foretaste of the next generation of sensor-controlled computers that we will operate with our voices or physical gestures, rather than keyboards and mice.

"Decode" ends with "Network," which examines the interconnections of mobile technologies and the Internet. It also illustrates how digital imagery is helping us to make sense of a frenzied, often confusing world. Take Aaron Koblin's "Flight Patterns," which shows a real-time image of the aircraft flight paths over the United States, something that changes so rapidly that it would have been impossible to depict in any other medium.

http://www.nytimes.com/2009/12/14/arts/design/14iht-design14.html?ref=design

The Pop Art Era

By DEBORAH SOLOMON
Skip to next paragraph

PAINTING BELOW ZERO

Notes on a Life in Art

By James Rosenquist with David Dalton Illustrated. 370 pp. Alfred A. Knopf. $50

POP

The Genius of Andy Warhol

By Tony Scherman and David Daltonm Illustrated. 509 pp. Harper/HarperCollins Publishers. $40

ANDY WARHOL

By Arthur C. Danto Illustrated. 162 pp. Yale University Press. $24

Is it possible for an artist to make a painting that is not informed by his own life? The Pop artists were initially both reviled and celebrated for refusing to make art about their "feelings." When Andy Warhol silk-screened an image of a Campbell's soup can onto a canvas, the impetus for art seemed to have shifted from the murk of the unconscious to the brightly lighted aisles of the supermarket. Pop Art was initially described as ironic, impersonal, emotionally cool — pick your favorite synonym for "refrigerated."

Yet it has been a half-century since Pop Art emerged, and it may be time to retire the clichés that still pervade so much of the writing about the movement's main figures. James Rosenquist is among them. His best-known work, "F-111" (1964-65), is an epic, multi-panel painting in which the sleek fuselage of a fighter bomber nose-dives into disparate images of an angel food cake, a Firestone tire and a mound of canned-style spaghetti. For all its jokey references, the painting is a powerful deconstruction of the American dream, questioning the connection between affluence and war. It ought to be obvious by now

that there is more creative heat in Rosenquist's "F-111" than in countless Abstract Expressionist paintings that were hyped in their time as marvels of raw emotion, if only because they offered improvised-looking drips and splashes in place of the patient description of the real world.

"Painting Below Zero: Notes on a Life in Art" is an amiable and rambling autobiography in which Rosenquist presents himself as a kind of accidental Pop artist, a painter from the flat plains of the Midwest whose work happens to overlap thematically, through no fault of his own, with that of Warhol. He resents being pigeonholed as a Pop artist, with the vaguely dissolute intimations of hands-off picture making and hands-on socializing. "I wanted to make mysterious pictures," he proclaims, implicitly allying himself with French Symbolist poets. He points out that he did not meet up with Warhol and Roy Lichtenstein until 1964, a few years after each of them had arrived independently at a style of painting that returned realism to avant-garde art. Rosenquist actually started life as a sign painter, and his achievement was to import the billboard aesthetic into high art.

Born in 1933 in Grand Forks, N.D., Rosenquist grew up mostly in Minnesota, an only child with little to occupy the unfilled hours besides a pet skunk and a precocious talent for drawing. "I was often alone in hotel rooms while my parents were traveling or at work," he recalls, "and I would spend the entire day creating elaborate battle scenarios." His father was an airplane mechanic who labored at odd jobs to make ends meet and for a while ran a Mobil station off the highway. His mother, an amateur painter in thrall to images of autumn leaves, supported her son's interest in art.There's a wonderful photograph in the book, circa 1954, that attests to Rosenquist's early love of road signs. It was taken outdoors, on an empty street in Minneapolis. The artist, then a tall, lanky man around 21, and his proud mom stand side by side, looking upward. Above them looms a giant billboard for Coca-Cola, one of the first Rosenquist ever painted. It is a genuinely captivating work, a roadside Magritte in which various unrelated objects (an arrow, a shapely glass of soda, a fashionable woman in a hat and gloves) float dreamily against a cloud-laced sky.Rosenquist moved to New York in 1955 to study at the Art Students League. His teachers George Grosz and Robert Beverly Hale were memorable enough, but his account of his education places less emphasis on the drawing classes where he sat and sketched the tibia and other bones than on his out-of-doors adventures. Hired by Artkraft Strauss, the company that designed much of the signage in Times Square, he spent the late '50s elevated on scaffolding above the streets of New York. He painted billboards for Castro convertibles, and others that exhorted young men to "join the Navy." He painted Elizabeth Taylor in a bathing suit, and the horses from the movie "Ben-Hur." He used the Renaissance grid method to scale up sketches to jumbo proportions, a technique he learned from his fellow sign painters, whom he describes, with possible exaggeration, as "at least 20 to 50 years older than me."

Rosenquist's memoir is anecdote-rich but short on introspection. Now married to his second wife, the father of a son and a daughter, he spent a large part of his adulthood unattached. Some of his comments about women convey a wariness bordering on misogyny. "The one thing that bothered me about them," he notes, referring to the many women he met in the '80s, "was their high-pitched voices, voices that went right through me like ice picks. For some reason I found this very unsettling and went in search of a woman with a low, mellow voice." It is a peculiar detail, this morbid sensitivity to the female voice. Coincidentally or not, the painting reproduced on the cover of the book, "I Love You With My Ford" (1961), includes an image of a woman's lips in sensuous close-up, whispering into a male ear. Maybe that's the artist's feminine ideal. Fortunately, he does not appear to have any issues with the decibel level of male voices. Rosenquist is one of those rare creative people with a talent for friendship, a capacity to be consumed by his work and still harbor a deep, unenvious curiosity about the work of other artists. "Rauschenberg always said he never entered his studio with an idea," he notes approvingly.

In writing his memoirs, Rosenquist enlisted the assistance of David Dalton, a founding editor of Rolling Stone magazine who has collaborated on yet another book this fall, "Pop: The Genius of Andy Warhol." The other co-author of this biography is Tony Scherman, a veteran music journalist. The notion of two connoisseurs of rock undertaking what seems to be the umpteenth biography of Warhol might not sound too enticing, but they have in fact written an excellent book, a work of great clarity and concision that makes Warhol (and rock critics) feel fresh again. "Pop" telescopes Warhol's life story into the span of just seven years, 1961 to 1968, when he was at his creative apogee and one could still speak, without

sounding inane, of the existence of an avant-garde in New York. The book closes dramatically, when a hanger-on named Valerie Solanas shows up at Warhol's studio and fires a bullet into his chest, leaving him in critical condition. The shooting is generally assumed to mark some kind of turning point, although no one has ever said persuasively whether it symbolizes the end of Warhol's youth, the end of the drug-addled scene at his Factory, the end of the whole raucous adventure of the '60s or just the end of Warhol's penchant for leaving his front door unlocked.

Arthur C. Danto, the eminent philosopher and art critic, ruminates on the shooting — "the first death," as he calls it — in his new book, "Andy Warhol." Short and analytical, the book is part of the "Icons of America" series, published by Yale University Press, and it situates Warhol in a lineage that also includes George Washington, Fred Astaire and the Hamburger, uppercase intended. "It is worth asking oneself," Danto observes, in reference to an article about the shooting that appeared in The New York Post, "how many other American artists would have made headlines had they been shot. . . . Of no other artist in America would this have been true." The claim seems overblown. As morose if not morally unsavory as it is to contemplate, one suspects that The New York Post, whatever its lapses, would happily report on the attempted assassination of any number of American artists.

But then Danto has long been an uninhibited champion of Warhol, whom he treats as a kind of honorary philosopher. He looks back nostalgically to April 1964, when Warhol had his second show at the Stable Gallery in New York. It consisted in its entirety of stacks of hollow plywood boxes silk-screened to look like grocery cartons. In the front room of the gallery, "Brillo Box" sculptures were piled up almost to the ceiling. The back room was reserved for Kellogg's cornflakes boxes and is said to have resembled the stockroom of an A.&P. It "was a transformative experience for me," Danto writes. "It turned me into a philosopher of art." Danto is an elegant and erudite writer, and his sentences go down smoothly. But the "end of art" thesis for which he remains known — it maintains that Warhol brought the great, galloping narrative of art history to a halt by resolving the old question "What is art?" (answer: art can be anything) — was one of those ideas that sounded interesting for a few years, until similarly fashionable pronouncements about the end of politics and the end of history deservedly met their own end. Pop Art, in the meantime, continues to offer up new meaning to a new generation. What originally was interpreted as an Ab Ex backlash — a process of subtraction and extraction that took the drip out of art, the tactility out of art and even, according to Danto, the artistry out of art — now seems more like a knowing wink at the American future. Why does Pop Art continue to speak to us so forcefully?

It is probably relevant that in July 1959, the so-called kitchen debate was held between Nikita Khrushchev and Richard Nixon. Staged in Moscow, in a faux suburban house constructed expressly for the occasion, the encounter offered Vice President Nixon the chance to demonstrate the everyday comforts and conveniences of American life, from Pepsi-Cola and Betty Crocker cake mixes to Cadillacs and G.E. dishwashers. The debate was seen around the world and redefined America virtually overnight as a consumerist utopia where the goods you stored in your kitchen cabinets were as much a symbol of cherished values as the bald eagle and the flag.The celebration of the kitchen as the locus of the American dream spilled over into Pop Art, especially in its early years, when artists appropriated images of soda pop and soup cans as well as a general just-mopped, mess-free look evocative of the suburbs. Rosenquist's paintings, with their fragmentary views of faces and merchandise filling ever-larger spaces, at times can put you in mind of shopping malls, and it may be meaningful that he grew up in the state (Minnesota) where the first-ever enclosed mall opened, in 1956. The story of America since then is, among other things, the story of how postwar affluence and the belief in luxury for every citizen gave way to a style of spending that kept expanding until a time close to the present, when the money finally ran out and people lost homes, jobs and their confidence in the future. The Pop artists were prophetic because they saw a new kind of America coming, a country where you are what you buy.

Deborah Solomon, who writes the "Questions For" column in The Times Magazine, is the author of "Utopia Parkway: The Life and Work of Joseph Cornell" and a forthcoming biography of Norman Rockwell.

http://www.nytimes.com/2009/12/13/books/review/Solomon-t.html?ref=design

John Singer Sargent's Model Children
By MEGAN MARSHALL
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SARGENT'S DAUGHTERS

A Biography of a Painting

By Erica E. Hirshler Illustrated. 262 pp. MFA Publications/Museum of Fine Arts, Boston. $29.95

When I moved to Boston some years ago, I made an early trip to the Museum of Fine Arts and found myself face to face with John Singer Sargent's nearly life-size portrait of four pinafore-clad girls, "The Daughters of Edward Darley Boit." Unlike many other visitors, I didn't take a seat on the bench in front of this haunting picture and study the canvas intently — or, as some have, begin to weep. I didn't even stay very long and, in the many times I've visited the painting since, I've never stopped to gaze at length, afraid I might not be able to quit looking. There has always been something mysterious and disturbing about these four girls, conventionally dressed and well-mannered though they seem: the antithesis of Louisa May Alcott's Little Women, who entered the public consciousness so boisterously in the late 1860s, just over a decade before Sargent painted the enigmatic Boit sisters.

The Boit family was from New England, but Sargent painted the girls in the foyer of a grand Paris apartment, deliberately situating them in a locus of uncertainty — perpetually on a threshold, like their roving expatriate parents, who had leased the suite of rooms three years earlier. Modern viewers may not understand, as people in their day would have, that those crisp white pinafores were intended to protect the girls' everyday finery. Who but the very rich, a very long time ago, would have dressed children in white for play?

It is, however, easy for anyone to read wealth in the parquet floors, the pale blue figured carpet on which the youngest girl sits and the two enormous blue-and-white Japanese vases against one of which the tallest girl leans, turning her face away from the viewer into a darkly shadowed room beyond, as if to remove herself from the bright light of childhood.

Sargent makes you feel simultaneously drawn into and excluded from the sisters' world, a phenomenon that Erica E. Hirshler, a senior curator at the Boston Museum of Fine Arts, explores in intriguing detail in her new book, "Sargent's Daughters." "From this singular picture," she explains, "a novel unfolds." And her "biography" of this painting — written after she documented the Boit sisters' lives and researched every significant detail in the painting, from the "molded composition" baby doll (named Popau after a right-wing French politician) to the floor plan of the apartment to the "colossal" vases "made specifically for the West according to Japanese ideas about what Europeans liked" — is that thoroughly absorbing novel.

The Boit family story could have been written by Henry James, who befriended the artist, socialized with the Boits and touted the virtues of this very painting, done when Sargent was 26 and exhibited in the Paris Salon in 1883, a year before the scandalous debut of "Madame X." The painter "has done nothing more felicitous and interesting," James wrote of the Boit sisters' portrait in a review for Harper's Magazine that made Sargent's reputation in the United States. "Astonishing," he judged the painting, for "the sense it gives us as of assimilated secrets and of instinct and knowledge playing together."

The girls' parents were the enchanting heiress Mary Louisa Cushing, known as Isa, and Edward Darley Boit, a handsome and courtly lawyer who depended on his wife's inheritance to support both his modestly successful career as a watercolor artist and what Hirshler calls the couple's "deliberately peripatetic life." Even when Paris became their "real home" in the late 1870s, the Boits never stayed long.

Of the two, it was Isa who most captivated James — "always social, always irresponsible, always expansive, always amused and amusing" and, more tellingly, "eternally juvenile." Sargent adored her too. Some years later, after he had finished Isa's portrait, he fretted that "it is impossible to paint a woman's face as pretty as it really is!" Isa's brother-in-law, Bob Boit, who minded the family fortune, wrote that "she delighted in everything but the commonplace." And this may have been a problem for her daughters, who didn't take after their mother. Those "white little maidens," as James called them, grew into "her long white progeny," whose "vitality is not sufficiently exuberant."

When the family returned to Boston for the coming-out season of the eldest daughter, Florence, Isa experienced what Bob Boit called "a great disappointment." Thrown into the social whirl with little preparation, Florie appeared to be "without grace or manners or conversation" and, perhaps not surprising under the circumstances, turned "rude and ungrateful to her mother."

"Poor Mrs. Boit," James wrote to a mutual friend, "she has as much business with daughters as she has with elephants." Worse, "her elephants grow bigger and bigger all the while and she doesn't; but only grows older and sadder and further away from her happy laughing irresponsible years." James undoubtedly also knew of the oldest Boit child, Edward Jr., who had withdrawn into what may have been an autistic silence at the age of 2 and lived apart from the family through all those "laughing irresponsible years" in an institution in western Massachusetts. Wisely, Hirshler doesn't speculate on the psychological impact their oldest sibling's fate may have had on the Boit daughters. Yet with the younger generation, the family "narrative of restlessness" veers into F. Scott Fitzgerald territory.

Florie took up golf and fine leather-working and lived with her cousin, a pioneering female M.I.T. graduate and instructor in biology at Simmons College. Jane, whose physical and mental health were always precarious, required constant nursing care in her Paris apartment. After many years in Europe, Mary Louisa and Julia returned to Newport in old age, with Julia producing sketchbooks full of expert watercolors but declining, for propriety's sake, to pursue a professional career as an artist. While Hirshler cautions that choosing a single life need not indicate unhappiness or disappointment, it is nonetheless striking that all four sisters remained unmarried and formed their closest ties with family members. Like Henry James, the nomadic Boits had "no other country" besides their own relatives.

The rich may, as Fitzgerald had it, be "different from you and me," but their children can suffer as painfully as any others from neglect by irresponsible parents and from the trauma of dislocation. That's why we stop and stare, if we let ourselves, at "The Daughters of Edward Darley Boit." We wish to stay with these lonely girls, dreading the move forward into the world of adult misfortune.

Since my first encounter with the painting, the Boit heirs have donated those six-foot-tall blue-and-white vases to the museum, thus preserving the "silent sentinels" that, Hirshler writes, in crossing back and forth across the Atlantic became the girls' "constant symbol of home." The vases, which now flank the painting, weren't empty when they arrived. Rather, "their miscellaneous contents" became "a document of mischief and the passage of time." Stuffed in with the packing materials were "a cigar stub, a paper airplane, a pink ribbon, a tennis ball, sheets of geography lessons, a letter about the repeal of Prohibition, an Arrow shirt collar, an old doughnut, an admission card to a dance at the Eastern Yacht Club in Marblehead, Mass., three badminton shuttlecocks, many coins and a feather."

Megan Marshall is the author of "The Peabody Sisters: Three Women Who Ignited American Romanticism."

http://www.nytimes.com/2009/12/13/books/review/Marshall-t.html?ref=design

'The Red Book of C. G. Jung: Creation of a New Cosmology'
Jung's Inner Universe, Writ Large
By EDWARD ROTHSTEIN

We know the archetype; we cherish the myth. The hero, like the world around him, is in a state of crisis. And in seeking to restore himself and the shattered cosmos, he valiantly passes through a vale of despair, descending into darkness. He risks his life and psyche in perilous encounters with dreams or dragons and finally emerges into the light, spiritually transformed, ushering in a new age.

That restoration may be like Odysseus' epic journey home or like the return of the Israelites to Canaan. It may be like Siegfried braving his way to the side of the sleeping Brünnhilde or like ... well, perhaps like the journey that Carl G. Jung tried to outline in a private chronicle he kept for 16 years that until recently had scarcely been seen by anyone outside the extended family of his descendants. It's an elaborately designed scripture, filled with his fantasies and surreal imaginings, known as "The Red Book."

The title is not a metaphorical allusion to blood's primal coloration nor does it require elaborate symbolic explication. The book really is red, and you can see it until mid-February, lying open in a glass case in an exhibition mounted in its honor at the Rubin Museum of Art in Chelsea: "The Red Book of C. G. Jung: Creation of a New Cosmology."

Jung, who by the time he began work on this tome had already broken with Freud and was developing his mythically suffused conception of the human psyche, made certain that the book's significance would not be overlooked by future acolytes. Bound in crimson leather, it is an enormous folio, more than 600 pages, bearing the formal title "Liber Novus" ("New Book"). Jung gave it all the trappings of antique authority and stentorian consequence, presenting it as a Newer New Testament.

He wrote it out himself, using a runic Latin and German calligraphy. Its opening portion, which begins with quotations from Isaiah and the Gospel according to John, is inked onto parchment, each section beginning with an initial illuminated as if by a medieval scribe with a taste for eyes, castles and scarabs.

The book's accounts of Jung's visions, fantasies and dreams are also punctuated with his paintings (some of which are on display in the exhibition), images executed during the years of World War I and the decade after that now appear as uncanny anticipations of New Age folk art of the late 20th century. They display abstract, symmetrical floral designs Jung came to identify as mandalas, along with almost childlike renderings of flames, trees, dragons and snakes, all in striking, bold colors.

But what is particularly strange about this book is not its pretense or pomposity but its talismanic power. It was stashed away in a cabinet for decades by the family, then jealously withheld from scholarly view

because of its supposedly revealing nature. Since being brought into the open, partly through the efforts of the historian and Jung scholar Sonu Shamdasani (who is also curator of this exhibition), it has become a sensation.

A meticulously reproduced facsimile, published in October by W. W. Norton & Company, with detailed footnotes and commentary by Mr. Shamdasani (who also contributed to the volume's accompanying translation), "The Red Book," costing $195, is in its fifth printing.

This modest show, in which the book is supplemented by displays of the author's notes, sketches and paintings, is now scheduled to travel to the Hammer Museum in Los Angeles from April to June, and then to the Library of Congress in Washington.

The book really is a remarkable object, and not just because it so eccentrically insists on its own significance. It represents Jung's thinking during a period when he was developing his notion of "archetype" and a "collective unconscious," positing a substratum of the human mind that shapes language, image and myth across all cultures. And as he was developing his ideas about psychological therapy as a form of self-knowledge, he seemed to have been engaging in just such a self-analysis: the book provides a bewildering, seemingly uncensored path into Jung's inner life. Mr. Shamdasani writes, "It is nothing less than the central book in his oeuvre."

That is something students of Jung's life and work can ponder as they try to put these gnomic tales into intellectual and biographical context. As Jung himself warned in an unfinished 1959 epilogue to this unfinished book, "To the superficial observer, it will appear like madness." Perhaps even to the nonsuperficial observer.

The narrator is a stand-in for Jung; he splits into multiple parts, engaging in cryptic dialogue with alternative souls. He is often in the company of a being named Philemon, an old man with the horns of a bull, a creature, Jung said, who evolved out of the biblical character Elijah. Philemon is a "pagan" who carries with him "an Egypto-Hellenic atmosphere with a Gnostic coloration."

Nearly every visitation has some such mix of exotico-mythico-primitivo coloration. One painting on display here shows a centipedesque dragon, its jaws opened to swallow a yellow ball.

Jung's explanation: "The dragon wants to eat the sun, and the youth beseeches him not to. But he eats it nevertheless." An inscription goes into more detail, naming figures in the story without explaining them: "Atmavictu," "a youthful supporter," "Telesphorus," "evil spirit in some men."

Confusion about the meaning of it all was apparently shared by Jung, who transcribed these visions and then reflected on them in streams of semiconsciousness, invoking death, sacrifice, love and acceptance, sounding at times like a Greek priestess moaning from the bowels of the earth. He wanders in the desert, he cries aloud, he eats the liver of a sacrificed girl, her head "a mash of blood with hair and whitish pieces of bone."

The temptation, after numbingly turning these pages, is to react finally like the psychiatrist Spielvogel at the end of Philip Roth's "Portnoy's Complaint," and say: "So. Now vee may perhaps to begin. Yes?" Maybe that was Jung's reaction too, which is why he abandoned the project in 1930. He couldn't even complete the epilogue, some 30 years later, breaking off in midsentence.

Now it may be, of course, that Jung was speaking profoundly in tongues, and that more devoted souls may stumble on the key to all these mythologies. Perhaps. Jung himself, after all, was engaged in more compelling systematic work about the primal forces of the psyche during this period (ideas that may have also influenced the late speculations of Freud). Yet right now the lure of the book comes not from within, but from without, not from what it deciphers, but from what it signals about our own mythological predilections.

Mr. Shamdasani argues that "the overall theme of the book is how Jung regains his soul and overcomes the contemporary malaise of spiritual alienation." And as he points out, Jung undertook his strange project after a series of apocalyptic visions in 1913 and 1914 that he later believed were prophesies of an imminent world war. He looked out a window, he said, and "saw blood, rivers of blood." Jung felt it within himself as well, the "menace of psychosis."

And so he began this enterprise of self-examination, a ruthless overturning of the rational Western mind, submerging himself in a pilgrimage through the pagan land of his own psyche. This project was his belated answer to Freud's "Interpretation of Dreams," which had also presented itself as the account of a heroic self-analytical descent into the maelstrom of the unconscious.

We are lured by that archetype still, even if it does not seem to shed the illumination Jung claimed. Go see this book and the exhibition, though, to glimpse an extraordinary relic of a particular way of thinking about the mind and its history. Then, cued by a 13th-century Tibetan mandala here that Jung owned, go upstairs and see the Rubin's astonishing show of these ancient Tibetan designs, each enclosing an encyclopedic universe, encompassing desire, venality, wisdom, ecstasy and passion. Maybe "The Red Book" deserves a diagnosis: Jung had mandala envy.

"The Red Book of C. G. Jung: Creation of a New Cosmology" is on view through Feb. 15 at the Rubin Museum of Art, 150 West 17th Street, Chelsea; (212) 620-5000, rmanyc.org.

http://www.nytimes.com/2009/12/12/arts/design/12jung.html

Patricia Highsmith, Hiding in Plain Sight
By JEANETTE WINTERSON
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THE TALENTED MISS HIGHSMITH

The Secret Life and Serious Art of Patricia Highsmith

By Joan Schenkar

Illustrated. 684 pp. St. Martin's Press. $40.

Patricia Highsmith said of herself, "I am always in love. . . ." Yet at her memorial service in Tegna, Switzerland, in 1995, there were no lovers from the past, and there was no lover to mourn her in the present. The service was filmed, which Highsmith would have liked, because although reclusive, she was interested in posterity. Such display also allowed Highsmith to hide in plain sight (as her hero Edgar Allan Poe put it in "The Purloined Letter") the fact that all her relationships had failed. Highsmith had died in a hospital alone, and the last person to see her was her accountant. Highsmith was obsessed with taxes.

There had been so many lovers, usually women, but men, too, including Arthur Koestler, who had the good sense to give up. Highsmith was attractive to men and to women, until her diet of alcohol and cigarettes (she hated food) raddled her beauty.

Men never fired her imagination, except in her fiction, where her males, especially Tom Ripley, are versions of herself. It was women she wanted, and she found them in bars, on boats, at parties and, best of all, in settled relationships with other people.

Highsmith loved a triangle, and she liked to destroy it, axing the part of the couple she didn't want, but usually sleeping with her first. Hers was a life jammed with encounters, and it is not by chance that her novels obsessively use the unexpected life-changing/life-threatening encounter as the drive into the narrative — think "Strangers on a Train" or any of the Ripley series.

Highsmith's one explicitly homosexual novel, "The Price of Salt," uses the spring of a particular encounter that the writer never forgot. As a young woman in New York City, Highsmith was working in the toy department of Bloomingdale's earning Christmas cash when a wealthy Venus in furs — older,

handsome — came in to order a doll. Simultaneously falling in love and falling ill with a fever, Highsmith went home in a daze and plotted the whole scenario for her novel — and even dared to give it something like a happy ending. What she didn't dare to do was publish it under her own name.

But this was the 1950s, and homosexuality was classified as a disease and a disorder. Highsmith's Freudian therapy had been aimed exclusively at "curing" her, though, bizarrely, she was offered a support group with other women, mostly married, who had homosexual tendencies. Highsmith thought she might seduce a couple, and as her lover at the time observed, "better latent than never."

Patricia Highsmith was as secretive as an oyster. She enjoyed the closeted hidden underground world of the gay scene in '40s and '50s New York and '60s and '70s Paris. She traveled in search of fresh encounters, and to rid herself of too much that could be known by others.

Highsmith left 8,000 pages of diaries and "cahiers," but as Joan Schenkar notes in "The Talented Miss Highsmith," she forged, fabricated and altered where necessary, just like her antihero Ripley. She lied all the time — to her lovers, to her friends, to the tax authorities, to publishers, agents, journalists, and to posterity. Lying about the facts was her way of telling the truth — as she understood it.

She was born in Fort Worth in 1921, in her grandmother's boardinghouse. The family came from Alabama, where Highsmith's great-grandfather had owned an antebellum plantation and 110 "body-slaves." (Highsmith loved that image.)

Highsmith was never comfortable with blacks, and she was outspokenly anti-Semitic — so much so that when she was living in Switzerland in the 1980s, she invented nearly 40 aliases, identities she used in writing to various government bodies and newspapers, deploring the state of Israel and the "influence" of the Jews. Yet Highsmith had Jewish friends, and her first boss was a Jew who did nothing but support her work. She wrote him out of her history, as she did her stint at writing comic strips in New York in the 1940s.

Highsmith had a kind of archive-attachment disorder; she adored lists. She chronicled, mapped, numbered and cross-referenced everything in her life, and even rated her lovers, but she wiped out what didn't suit her and only vaguely acknowledged, when pressed by the more ferrety kind of interviewer, having conjured up a few story lines for Superman and Batman.

In fact her job was much less glamorous than plotting for those superheroes, but the comic strip formula of threat/pursuit/fantasy life/alter ego/secret identity was the formula she used in all her work. The four-color, six-panel comic strip shaped Patricia Highsmith the crime writer like nothing else — however much she cared to cite Dostoyevsky and Henry James.

Her emotional shaping came from her sexuality and from her turbulent relations with her mother and stepfather. "I learned to live with a grievous and murderous hatred very early on. And learned to stifle also my more positive emotions." She also believed that homosexuals, in concealing their preferences, conceal their "humanity and natural warmth of heart as well."

Concealment was her game, and her way of life. Dating three women at a time was not difficult for her. She collected snails, liking their portable hiding place and the impossibility of telling which was male and which was female. She traveled with snails in her luggage and kept hundreds at home. If she was bored at dinner parties, she might get a few snails out of her purse and let them loose on the tablecloth. As she didn't eat much, she was often bored at dinner parties.

How good a writer was she? "Strangers on a Train," "The Price of Salt" and "The Talented Mr. Ripley" are hypnotic and amoral novels, pushing past any genre, unsettling the reader and using the limitations of her prose style — her karate-chop syntax — to create a powerful effect. My own feeling is that when Highsmith consciously tried to be literary it never worked, and when she went for money and fame (the

more she earned the meaner she became), she found a formula and lost her form. The problem wasn't the supposed confines of crime writing, but her increasing refusal — in love or in work — to let a relationship happen. And art is always about relationship — to the material, to the self, and to the world in all its chaos and intrusion, its terror and its glory.

And yet, with Ripley she created a new kind of criminal, not seen before in crime/murder/detective fiction — his nearest relative being something out of de Sade — whose criminal libertines challenge what we mean by good and evil, and also thrive unpunished.

Joan Schenkar has been able to use previously unpublished and undocumented Highsmith material and has been given full access to the Highsmith archive in Bern, Switzerland.The University of Texas at Austin had offered $25,000 for the papers, which Highsmith dismissed as the "price of a used car." Hiding herself in a Swiss vault is very Highsmith. She did, though, at the last possible second, leave her considerable fortune to the artists' colony Yaddo.

Schenkar has a wonderfully bold approach: not worrying about a linear chronology (although this is meticulously supplied in the appendices), but choosing instead to follow the emotional watercourse of Highsmith's life, allowing her subject to find her own level — to be tidal, sullen, to flow without check, so that events in one decade naturally make an imaginative tributary into turbulence before and after.

Schenkar's writing is witty, sharp and light-handed, a considerable achievement given the immense detail of this biography. Highsmith was a detail junkie. Schenkar's nonlinear organizing method was a brilliant idea to save herself — and the reader — from data overload.

This is a biography of clarity and style. A model of its kind.

Jeanette Winterson's latest novel is "The Stone Gods."

http://www.nytimes.com/2009/12/20/books/review/Winterson-t.html?ref=books

Art Among the Ruins
By LISA SCOTTOLINE

DOGTOWN

Death and Enchantment in a New England Ghost Town

By Elyssa East

291 pp. Free Press. $26

"Dogtown: Death and Enchantment in a New England Ghost Town" is a true-crime story, an art appreciation course and an American history lesson stitched together, and it succeeds as all three, albeit with a few seams showing.

It begins with a painting. In the early 1990s, Elyssa East was studying art history at Reed College when she chanced across a work called "Mountains in Stone, Dogtown" (1931), by the American artist Marsden Hartley. She quickly became obsessed with Hartley — "my imaginary friend and mentor" — and eventually determined to visit Dogtown, in Gloucester, Mass., to find the spot where "Mountains in Stone" was made. Considering the painting's central role, it's a shame the book doesn't reproduce it (I, for one, was unfamiliar with Hartley), but East is so earnest in her appreciation that I was willing to go with her into the Dogtown woods. In particular, she was looking for the one rock formation that could point her, "like an oracle," to the site of Hartley's painting. But she found much more.

Dogtown turns out to be a colonial ruin and a 3,000-acre wood dense with eccentric townies, ghost stories and, tragically, the haunting memories of a real-life murder from 1984. The victim, a teacher named Anne Natti, was walking her puppy in the woods when she was attacked from behind, her skull crushed by a rock. Her murderer was Peter Hodgkins, a local dropout and dockworker bullied as a child because of his buck teeth and long legs, who grew up choking kittens, crashing his bike into moving cars and exposing

himself to women before he killed Natti on sheer impulse. Hodgkins confessed, then attempted suicide three times (once in the courthouse bathroom) before his conviction.

East deserves credit for bringing the case to light and for reporting it with deft, moving details, like the fact that Natti carried her puppy's leash in a plastic bag, which was found later near her body, or that during her hikes, Natti would leave a "woodland calling card," like a branch or a bunch of flowers, for a former roommate who had often visited Dogtown with her. The Natti story is easily the most interesting and dramatic element in the book, and East is at her best in its telling.

Indeed, "Dogtown" would have been stronger had its art and history components been subordinate to the crime story. It's unfortunate that East seems to underestimate the emotional impact of the murder, both in her book and in reality. When a resident asks her if she feels comfortable going alone into the Dogtown woods, East writes:

"There she was again: Anne Natti. Why could people not just let her be? One woman dies in some woods 20 years ago — many people around this town did not even know her — but people still talk about it. Why is that? It would have been a fair enough question to ask, but I was at a complete loss for words."

East is an excellent researcher, and "Dogtown," her first book, is full of interesting facts about New England history and native poets like Charles Olson. But research, however interesting, has to serve a narrative, not drag it down, and the book would have benefited from trims to the information about the Massachusetts Department of Environmental Management, Gloucester City Council politics and eminent domain issues relating to the city's water supply, among other things.

Still, plaudits to East for exploring the relationship of the land to artists, as well as to the people who live upon it, in this case for generations. Ultimately, "Dogtown" is an ambitious and worthy book, and the whole ends up being greater than the sum of its parts.

Lisa Scottoline's latest book is "Why My Third Husband Will Be a Dog: The Amazing Adventures of an Ordinary Woman."

http://www.nytimes.com/2009/12/20/books/review/Scottoline-t.html?ref=books

The Wonder Years
By STEPHEN BURT

EASY

Poems

By Marie Ponsot

82 pp. Alfred A. Knopf. $26

Next April, Marie Ponsot will turn 89 years old. The best work in "Easy," her sixth collection, responds — with cheer and tolerance, with terse good humor — to her accumulated years. "Old's our game," says the woman (not the poet) who speaks in the sonnet "We Own the Alternative": "Mere failure to be young is not interesting." What interests Ponsot instead is the set of perspectives that old age creates for her — calm, tolerant and often delighted.

Ponsot published her first book in 1957 but gained national attention in 1998 with "The Bird Catcher," her fourth. That book, like this one, could imply that accumulated experience (motherhood, travel, long acquaintance with friends, long residence in New York City) made possible the confidence her style shows. Lines and sentences zig and zag as they please, go on unpredictably or stop short. Her inventions are quirky nonce forms, almost stunts — the ode whose first four lines all end in "cloud," the lines in "Head Turkey Muses: A Soliloquy" whose boasts mimic gobbles: "I am sentinel to / hens. I do them all. Not you. I do." "Peter Rabbit's Middle Sister" revels in more intricate phonic play: "fast in the thorned clutch / of your hedge-hemmed root-safe bedtime-tale hutch." (It is not the only place where Ponsot echoes Marianne Moore.)

Buttressed by years, Ponsot can give advice worth pondering: "Go to a funeral / as to a wedding: / marry the loss. / Go to a coming / as to a going: / unhurrying." Age yields, sometimes, reasons for new delight: it is like touring Europe without a guide or a list of must-see locales, "stopping & starting, off-season, / off-peak, on time, on our own." Unintimidated by strangers' opinions, Ponsot can sound enthused or merely precious, sincerely awestruck or simply naïve. She can also permit herself frank comments about other people's lives: in a sonnet about a rich old man and his second wife, "he / does look awkward, playing young, playing lord. / She's bored. He's scared. She's scared. He's bored."

Ponsot's best work finds her down-to-earth, either mordant or lighthearted; when she reaches for the sky, she can trip herself up. Too often her poems inform us that language sparkles, that poetry refreshes, that clouds, plants or poems are miraculously wonderful: "words become us / we come alive lightly / saying

Oh / at the wordstream of sentences"; "the delicious tongue we speak with speaks us." Of art in general, she decides, "we live by the replay that gratifies / the thirst it rectifies," as if art could gratify every thirst it presents. On Easter Saturday — the day after crucifixion, before Resurrection — the poet's breath becomes "a strong pulse / of everywhere hooray."

Durable poetry certainly can say hooray — Gerard Manley Hopkins, one of Ponsot's heroes, wrote a beautiful sonnet called "Hurrahing in Harvest" — but it cannot often congratulate itself. In interviews, Ponsot has mentioned her Catholic faith, and she pays homage to the Catholic Hopkins, who endeavored (as she does) to see in each plant, each animal, each sort of weather, a unique instance of Providence: "Loft him Halo him / Prize him high, pen in hand," she tells Hopkins ("him" is God). But Hopkins was also a poet of anger and terror, frustration, mundanity, even despair: "No worst, there is none," he wrote. "Pitched past pitch of grief."

No poet must feel such anguish just to write well; but Ponsot's own writing, like Ponsot's version of Hopkins, can seem so self-consciously affirmative, so determined to look on the bright side, as to miss a great deal of what other people see. "Walking Home From the Museum" sets Ponsot's own fallen language, her own imperfect faith, against a "Paradise panel" of confident angels, "the vivid repose of each breathless face," "their speech sung as if not split from song." The very admission on which that sonnet turns — that our speech is not their song, that our Earth is not Heaven — makes it stand out amid its more sanguine peers.

Ponsot's strongest lines admit both satisfaction and futility, pleasure and pain, without allowing either to conquer the other. "What Speaks Out" admires a Bronze Age lute, "harplike, huge," even though it was found in an ancient tomb beside "the dust of the three skulls / of three young women / whose heads it crushed." "Orphaned Old" begins with a memorable understatement: "I feel less lucky since my parents died."

For all its insistence on exuberance, there is something brittle, like china, about Ponsot's style. Other poets who use, as she does, short lines, a conversational pace and frequent enjambments can feel rushed or wild. Ponsot instead tends to tread slowly, as if careful not to damage the copious beauties she finds on the streets of Manhattan, in its museums, in clouds, in air. In the last and longest poem here, "Dancing Day II," gratitude and apprehension, strength and fragility mingle in a direct portrayal of old age. The poem's coming event is at once the end of a life and the sociable delight of another night out:

> We're running out of time, so
> we're hurrying home to
> practice to
> gether for the general dance.
> We're past get-ready, almost at get-set.

Such attitudes — tender, alert, self-ironized and finally unillusioned — propel all of Marie Ponsot's best poems.

Stephen Burt, an associate professor of English at Harvard, is the author of "Close Calls With Nonsense: Reading New Poetry."

http://www.nytimes.com/2009/12/20/books/review/Burt-t.html?_r=1&ref=books

After the War, Before the War

By ALEX VON TUNZELMANN

THE TWILIGHT YEARS

The Paradox of Britain Between the Wars

By Richard Overy

Illustrated. 522 pp. Viking. $35

"It is a fact so familiar that we seldom remember how very strange it is," the historian George N. Clark wrote in 1932, "that the commonest phrases we hear used about civilization at the present time all relate to the possibility, or even the prospect, of its being destroyed." In "The Twilight Years," his thought--provoking and illuminating new study of the interwar period, Richard Overy contends that before 1914 the British believed they had conquered the world and would rule it forever. After World War I, a wrecked generation had to pick up the pieces of that world and ask what went wrong. It is this process that occupies the book, which successfully adopts a broad-brush approach to cultural life without obscuring gemlike details. During the 1920s and '30s, Britain saw itself as a civilization in crisis, facing the ominous dawn of a new Dark Age.

If this feels familiar, Overy is not surprised. "For some years now," he writes, "there has existed a popular belief that the Western world faces a profound crisis." A professor of modern history at the University of Exeter, Overy argues rather sternly that, in fact, the West today enjoys a far more secure and wealthier way of life than at any point in history. By contrast, during the interwar years the British — then occupying a position approximately analogous to modern Americans in terms of global influence and responsibility — had indisputable cause for fear. Nearly a million British subjects were killed during World War I, and soon afterward fissures began to show in the empire. At the beginning of the '30s, the world faced a serious financial downturn, and the rise of new and deadly forms of political extremism. When Hitler came to power in 1933, Britain, France and Spain were, as Overy points out, the only major democracies left in Europe.

Skeptic though he may be about equating interwar Britain with the modern United States, Overy is clearly tickled by the parallels. He is too sophisticated a historian to belabor them, but from a chapter entitled "The Death of Capitalism" to his account of the self-proclaimed agents of morality attempting to "cure" homosexuality, there is plenty here that strikes a chord. On that supposed cure, the editor of the prestigious medical journal The Lancet was convinced that proper treatment could turn any homosexual into "quite a cheerful citizen" — though it is hard to imagine many of the unfortunate subjects being cheered up by the combination of vigorous exercise and cold baths he prescribed.

The economy of the early 1930s was, as John Maynard Keynes put it, in "a frightful muddle," and capitalism itself was increasingly seen to be riddled with flaws. Debate raged about whether it should be reformed or junked. "The signposts of economic and social evolution point inevitably from capitalism to socialism and communism," the young economist Maurice Dobb wrote. He became a prominent intellectual, accepting a position at Trinity College, Cambridge: as Overy acidly notes, "the college tolerated his Marxism and he, evidently, tolerated its opulence."

Dobb was unusual. Though a more moderate socialism did come to hold political sway in Britain, the nation consistently rejected the extremist politics that swamped the rest of Europe. Even at the outbreak of World War II, Communist and fascist parties counted their combined memberships at around 40,000 — less than one percent of the population — and few of those were active. In 1933, Wyndham Lewis's sympathetic biography of the new German chancellor, Adolf Hitler, was displayed in a famous bookshop on London's Charing Cross Road. Twice a day, the window had to be hosed down to remove all the accumulated spittle.

While British politics remained resolutely mainstream, science flirted with the fringes. Social hygienists recommended that girls eat cakes and porridge to avoid sexually awakening themselves. Psychoanalysts applied their theories to "the insanity of nations." Eugenicists claimed that a "defective" generation was being bred, arguing that criminality as well as physical and mental characteristics were inherited via "germ plasm." Those classed as defective could include vagrants, inebriates, drug addicts, prostitutes, perverts, imbeciles, deaf-mutes, the blind, the insane and epileptics — totaling, in one estimate, 9.5 million people, almost one-quarter of Britain's population. The birth control pioneer and eugenicist Marie Stopes, concerned with the decline in what she called the "imperial race," disowned her own son because he married a woman who wore spectacles.

The outbreak of the Spanish Civil War in 1936 pitted the democratic republic against nationalist authoritarians. The conflict made a profound impact on Britain — one which, as Overy rightly says, has often been underrated. His chapter on it is one of the most affecting sections of the book, telling of how 4,000 Britons — scientists, philosophers, poets and manual workers alike — volunteered to fight Fascism in a country to which they had no connection, simply because they believed it to be a just cause. George Orwell was among those who went, hand grenades dangling from his belt, accompanied by a small dog with the initials of the Marxist party to which he belonged painted on its side. Orwell, Overy says in the course of a particularly winning description, was "so fastidious about completing his toilet each day that if there was no water to shave in, he would shave in wine." That certainly brings a whole new dimension to Champagne socialism. Orwell was wounded in action, shot through the neck by a nationalist sniper. He was lucky to survive. Many did not.

Such had been the horrors of World War I that pacifism, and the avoidance of war by any means, was a dominant theme of the interwar years. The Spanish Civil War and the enormities of the Nazi regime in Germany changed that. "I hate war with as much venom as you do," the novelist Storm Jameson wrote to her pacifist colleague Vera Brittain, "but I have come to believe that there are certain values for which it may be necessary to fight." When the crisis of civilization really did arrive in the shape of World War II, there was no choice about how to deal with it. Britain fought for its liberty and its life.

"The Twilight Years" was published in England as "The Morbid Age." Overy notes that Leonard Woolf was obliged to retitle some of his books for American publication: "Barbarians at the Gate" became "Barbarians Within and Without," and after some debate "Quack Quack," his critique of capitalism,

became “Quack-Quack,” with a hyphen. These may be trifling, but Overy’s British title is more memorable and more appropriate to the content than the American one. It is hard to see why a publisher would prefer “The Twilight Years” — unless putting the word “Twilight” on the cover is enough to persuade Stephenie Meyer’s audience of teenage vampire fans to buy scholarly British cultural history.

Whatever it may be called, Overy’s study of British culture between the wars is absorbing and unexpectedly moving. Some of its stories may haunt the reader long after the book has been closed, and not just the morbid ones. This reviewer has been unable to forget the June 1939 survey sent out to all medical personnel of the British Psycho-Analytical Society, asking them to state preferences for their wartime service — whether they would rather do hospital work, emergency work, work with children or work with adults. Ernest Jones, the 60-year-old doyen of British psychoanalysis, sent back his form with a simple declaration scrawled at the bottom: “Ready for anything. E. J.” Perhaps that is a clue to why, despite the all-pervading sense of crisis, Britain survived its twilight years — and the catastrophic war that followed.

Alex von Tunzelmann’s latest book is “Indian Summer: The Secret History of the End of an Empire.”

http://www.nytimes.com/2009/12/20/books/review/VonTunzelmann-t.html?ref=books

That Bloody Shower and Its Violent Offspring
By MICHIKO KAKUTANI

THE MOMENT OF PSYCHO

How Alfred Hitchcock Taught America to Love Murder

By David Thomson

183 pages. Basic Books. $22.95.

Toward the end of his thought-provoking book "The Moment of Psycho," the film historian David Thomson gives us a long list of movies made possible or informed by Alfred Hitchcock's 1960 horror classic "Psycho" — a list that includes not just Brian De Palma homages to Hitchcock like "Dressed to Kill" and slasher films like "Halloween" and "The Texas Chain Saw Massacre" and their innumerable spawn, but also some less obvious choices:

¶The continuing Bond franchise, which, Mr. Thomson notes, cashes in on the "tongue-in-cheek attitudes toward sex and violence" pioneered by Hitch.

¶"Bonnie and Clyde," which, like "Psycho," left audiences alarmed at their capacity to enjoy violence in the darkness of a movie theater.

¶"Jaws," which, like Hitchcock's films, used artfully cut sequences and carefully paced scenes to manipulate audiences and amp up their feelings of fear.

¶"Taxi Driver," which, like "Psycho," features a "lone-wolf outsider" who both frightens and repels us, even as he allows us to "see a glimpse of ourselves in him."

¶Stanley Kubrick's movies "Lolita," "A Clockwork Orange" and "The Shining," which, like "Psycho" and so many other Hitchcock films, share "an extreme appetite for technique that sometimes forgot 'content'; a recognition of watching as perhaps the central expression of modern intelligence and a surgeon's interest in the eye."

Though readers may not agree with all of Mr. Thomson's arguments here, he makes a powerful — and sometimes surprising — case for the movie's importance in film and cultural history. Building on the work of François Truffaut (who first helped establish Hitchcock's reputation as an auteur) and the

writings of the critic Robin Wood, Mr. Thomson does a deft job in this volume of reappraising Hitchcock's work, even as he deconstructs "Psycho" and its complex cinematic legacy.

First of all, Mr. Thomson argues, the movie represents "a crossroads moment" in terms of censorship. For Hitchcock it was a kind of test as to whether "he could get certain things" — like the famous shower stabbing scene — past the censors. In the 50 years since, as films have grown increasingly violent and graphic, and as television has brought bloodshed into our living rooms, he adds, "our capacity for seeing pain has increased beyond all reason." In the movies, "bloodletting, sadism and slaughter are now taken for granted," he writes. "In terms of the cruelties we no longer notice, we are another species."

The second, more interesting point that Mr. Thomson makes about the lasting impact of "Psycho" concerns its "ironic (or mocking) treatment" of sex and violence. Norman Bates's sardonic line "My mother's not herself today" becomes "a taster for so many Clint Eastwood lines, like, 'Do you feel lucky? Well, do you, punk?' " Mr. Thomson argues. "Such lines encouraged our habit of talking back to the screen and making a game out of death."

The aestheticization of death and violence — and the growing divorce between content and style, story and visuals — would gain speed with the explosion of sophisticated special effects. Mr. Thomson observes that "the movies had always loved new special effects" — "Citizen Kane," for one, is full of them — but "in the years after about 1970, the ability of these effects, culminating in computer-generated images, to release violence was beyond question and out of control": "all too often, it was a 'fun ride' separated from pain, damage and consequence."

When asked about the gruesomeness of some of his films, Hitchcock would shrug and say, "It's only a movie," a remark that echoed Jean-Luc Godard's smart-alecky observation "That's not blood — it's just red." The emphasis that Hitchcock and members of the French New Wave placed on technique would help elevate film to the realm of art. But, in Mr. Thomson's view, the lasting consequences have not all been good: "Alfred Hitchcock had yearned to make movies important, respectable and artlike. He had achieved an international sensation and helped establish the power of the director as auteur. But he had also isolated films from the larger horizons of meaning."

In the course of explicating "Psycho" Mr. Thomson occasionally overstates its importance. For instance, in trying to make the case that the Hitchcock film represented a break from the past, purveying a dark new side of American life, he shrugs off movies like "Sweet Smell of Success" and "The Night of the Hunter" as not being regarded as important mainstream Hollywood films. And he completely plays down the postwar efflorescence of film noir, which reflected the anxieties of the atomic age and depicted a world of vice and alienation and corruption.

When he sticks to talking closely about "Psycho" and Hitchcock's vision, however, Mr. Thomson is at his best, goading the reader to rethink that movie and its influence, while demonstrating the wit, acuity and daunting knowledge of cinema that have made his "Biographical Dictionary of Film" a classic reference work.

http://www.nytimes.com/2009/12/18/books/18book.html?ref=books

Once More, Revisiting Anne Boleyn Yet Again
By JANET MASLIN

THE LADY IN THE TOWER

The Fall of Anne Boleyn

By Alison Weir

Illustrated. 434 pages. Ballantine Books. $28.

With "The Lady in the Tower," Alison Weir inserts herself into the scrum of historians eager to interpret Anne Boleyn's story. Ms. Weir is no stranger to this crowded realm. She has already written "The Six Wives of Henry VIII" (Anne was the second); "Henry VIII: The King and His Court" (Anne played an active role in court intrigue); "Children of Henry VIII" (Anne bore him one, a daughter); and "The Life of Elizabeth I" (that daughter grew up to be Elizabeth I, a k a the Virgin Queen). She has also written numerous additional works about British royalty.

So why another? Because this time Ms. Weir sets out to study one four-month period at particularly close range and to search for the truth by examining primary sources. The narrow range of "The Lady in the Tower" extends from the death of Anne's predecessor, Katherine of Aragon, in January of 1536 to Anne's beheading in May of that year. Ms. Weir takes an investigative approach to the forces that toppled Anne from favor and led to her trial and execution.

To Ms. Weir's credit she is well equipped to parse the evidence, ferret out the misconceptions and arrive at sturdy hypotheses about what actually befell Anne. Her command of minutiae is impressive, as is her enthusiasm for even the most minor aspects of Anne's frequently distorted story. To Ms. Weir's disadvantage, this subject has been so frequently dramatized that her sometimes-inconclusive scholarship can seem ponderous and dry.

"The Lady in the Tower" glaringly omits any mention of Hilary Mantel's "Wolf Hall," this year's Man Booker Prize-winning novel, which so ingeniously focuses on the machinations that made Thomas Cromwell the primary architect of Anne Boleyn's destruction. Yet Ms. Mantel provides such a delectably arch portrait of Anne, and stints so deliberately on the clear historical details, that these two books serve as useful companion pieces. "Wolf Hall" is the more impenetrable. It is also the livelier by far.

"The Lady in the Tower" takes its title from one of the many, many pieces of evidence that Ms. Weir holds up for scrutiny. It comes from a letter of typically shady provenance, since much of the detail

surrounding Anne's undoing surfaced long after she had been undone. The letter is addressed "To the King from the Lady in the Tower," and it first surfaced in 1649. Some have claimed it was copied by Cromwell from an original letter written by Anne on May 6, 1536, while she was imprisoned in the Tower of London. Historians have long debated the letter's authenticity, and they have had ample reason to do so. Ms. Weir works hard to analyze not only the historians' positions but also the essence of the letter itself.

In this instance, which is typical of the book's approach, she sets forth various researchers' thoughts about whether the letter was in Anne's handwriting. Then she points out that Anne may have been so distraught that she needed to dictate, and that the handwriting issue may not be germane. (Besides, it might be Cromwell's version.) Then she raises the question of why Cromwell would have held onto this document, "for why would Cromwell think it desirable to keep a letter from Anne protesting her innocence?" Most interesting, she notes that the "Lady in the Tower" locution is odd for a woman who regarded herself to be queen. And if Anne did not compose this letter, Ms. Weir wonders, who did?

Some of this book's investigatory sojourns are far more palatable than others. The details surrounding the executions of Anne and her supposed lovers and co-conspirators are at least as ghastly as they are fascinating. What made beheading the most merciful form of execution? What made a sword a better implement for this than an axe? Why was an executioner summoned before the trial was even over? Did the sword have a groove to accommodate rivulets of blood? How long could Anne's eyes and lips have kept moving after her head and body parted ways, and for how many seconds might she have suffered pain? It takes a hard-core monarchy enthusiast to appreciate Ms. Weir's indefatigable pursuit of such information.

On the other hand, the legal arguments that arose from Katherine of Aragon's death are well worth examining: Henry of course fought to annul his marriage to Katherine in order to marry Anne, forcing a break with the papacy and thus changing Britain's religious history forever. He was not free to have his marriage to Anne annulled until after Katherine died, for fear of reigniting questions about the second marriage's legitimacy. And Anne could not have been tried for adultery, as she was, if her marriage to Henry had not remained intact until that point. Ms. Weir does an extremely patient job of sorting out the implications of some of history's most famous marital problems, and of trying to fathom Henry's state of mind throughout.

For all of its intimate involvement in Anne's plight, "The Lady in the Tower" is most worthwhile for its larger overview. It winds up weighing Anne's influence on the life of her daughter. (Among its unusual illustrations is a picture of the ring Elizabeth wore until her death, decorated with a hidden likeness of her mother.) It describes the way interpretations of Anne's story have changed over the centuries. It points out that the present-day prevailing attitude (that Anne was "the prime cause and mover of the Reformation") could be a sweeping overstatement.

Most important, it does not hedge its bets about Anne's relative innocence and culpability, nor does it foster any illusions about the romanticizing of her story. What if Anne had outsmarted her enemies and survived into old age? "It is virtually certain," Ms. Weir concludes, "that, dying in her bed, she would not have enjoyed the charismatic, romantic posthumous reputation that is hers today." And a vast cadre of British court historians would have had to find something else to do.

http://www.nytimes.com/2009/12/17/books/17book.html?ref=books

Disease Risk Depends on Which Parent a DNA Variant Is Inherited From
By NICHOLAS WADE

Icelandic biologists have discovered that the genetic risk of several common diseases, like Type 2 diabetes and cancer, can depend on which parent a DNA variant is inherited from.

The finding may help explain part of a serious gap in understanding the genetics of common diseases. Using an extensive genealogy that includes almost all the present population of Iceland and many in previous generations, the Reykjavik company DeCode Genetics managed to distinguish which chromosomes came from the father and which from the mother in some 40,000 people.

The company then ran standard tests, known as genome wide association studies, the tool that scientists have hoped would track down the roots of common diseases and fulfill the promise of the Human Genome Project. But with most of these common diseases, the tests have so far identified genetic variants that account for only a small percentage of the risk. This is in contrast to simple diseases, most of them rare, where a single gene is the cause and the disease has a clear family pedigree.

The failure has left biologists puzzled about the missing heritability, which some have jokingly attributed to "dark matter" within the human genome, an analogy with the dark matter invoked by cosmologists to explain the missing mass of the universe.Some experts believe the missing risk might be carried in a large number of rare DNA variants not included in current scans of patients' genomes. Because it costs too much to decode all three billion units of DNA in a patient's genome, biologists use chips that scan just the 500,000 sites where variation is most common. These sites were expected to explain the genetic component of common diseases like cancer or schizophrenia, but mostly do not do so.

Another explanation is that the missing heritability lies in aspects of cell biology that are not yet understood. Decode scientists have found one such instance. They report in Friday's Nature that a DNA variant increases a person's risk of Type 2 diabetes by 30 percent if inherited from the father, but reduces the risk by 10 percent if comes from the mother.

Because the two effects tend to cancel each other out, they have not been picked up by the standard tests that do not identify the parental origin of each section of DNA.

DeCode found that five of seven variants tested made different contributions to disease depending on the parent of origin. In most cases the effect was of differing degrees of severity, depending on the parent involved.To increase the chances of seeing such an effect the researchers tested known disease-associated variants that lay close to so-called imprinted genes, ones where the copy from one parent is suppressed. They now plan to survey the rest of the genome.

Kari Stefansson, DeCode's chief executive, said he could not predict how large a percentage of the missing heritability the parent-of-origin effect might account for. "But I think it's going to be substantial," he said.

DeCode Genetics recently filed for bankruptcy, but the company plans to continue operations in another form. Dr. Stefansson said that its access to the Icelandic genealogical database would give it an advantage in searching for disease genes in circumstances where it is essential to know the genetic structure of a population.

Mark Daly, a medical geneticist at Massachusetts General Hospital, said that DeCode's result was "a significant finding" and that it confirmed the idea that effects of this nature would account for some of the missing heritability.

http://www.nytimes.com/2009/12/19/science/19gene.html?ref=science

As Patent Ends, a Seed's Use Will Survive
By ANDREW POLLACK

Facing antitrust scrutiny over its practices in the biotechnology seed business, Monsanto has said it will not stand in the way of farmers eventually using lower cost alternatives to its genetically modified soybeans.

In letters to seed companies and farm groups this week, Monsanto said that it would allow farmers to continue to grow its hugely popular Roundup Ready 1 soybeans even after the patent protecting the technology expires in 2014.

The letter countered a widespread impression in the agriculture business that Monsanto planned to force farmers and seed companies to migrate to a successor product called Roundup Ready 2 Yield, which will remain under patent and is more expensive.

The issue has potentially broad implications for the agriculture industry because Roundup Ready soybeans will be the first widely grown biotechnology crop to lose patent protection since gene splicing became a mainstay of crop science in the 1990s.

Because farmers and seed companies would no longer have to pay royalties to Monsanto on the gene after 2014, Roundup Ready soybeans would become agricultural biotechnology's equivalent of a generic drug.

Monsanto's statement comes as the Justice Department is investigating possible antitrust concerns in the seed business, looking in particular at Monsanto, which dominates the business of supplying crop traits developed through genetic engineering. Critics, including some competitors, say that Monsanto has great leverage over the seed business and growers through restrictive contracts that must be signed to use Monsanto's genes or to grow the genetically modified crops.

Monsanto calls such criticisms baseless. But it certainly is getting harder for seed companies to avoid using the Roundup Ready bacterial gene, which makes the plants impervious to the widely used herbicide glyphosate, which Monsanto sells as Roundup.

That allows farmers to spray their fields to kill weeds without harming the crops. More than 90 percent of the soybeans grown in the United States contain it. So do about two-thirds of the nation's corn and cotton crops, though those are protected by different patents that expire later than the soybean patent.

Gerald A. Steiner, executive vice president for corporate affairs at Monsanto, said Thursday that Monsanto was not changing its policy on how it would handle the soybean patent expiration, but was merely clarifying its intentions.

"What's different," he said, "is we have made a very comprehensive communication of what we are going to do."But the widespread impression in the seed business was that Monsanto was backing away from a previous policy.

"The only thing we were told was that as of 2014 you would not be able to sell any more Roundup Ready 1," said Jack Debolt, manager of Advanced Genetics, a coalition of small Ohio seed companies that license the Roundup Ready gene from Monsanto to put in their seeds. Monsanto's biggest competitor, DuPont's Pioneer Hi-Bred seed company, has also accused Monsanto of antitrust violations including, as it says in a lawsuit, an effort to "remove Roundup Ready from the market prior to the time when competitors will be able to produce a generic product."

Mr. Steiner of Monsanto said one reason for the company's letters this week was to counter statements made by Pioneer, which Monsanto has sued alleging patent infringement.Roundup Ready seed can cost as much as $75 an acre compared with $30 to $35 for soybean seeds that are not genetically modified, according to James Beuerlein, a soybean specialist at Ohio State University. The difference in price is thought to reflect mainly royalties paid to Monsanto.

While Monsanto sells Roundup Ready seeds itself, it also licenses the technology to other seed companies. Some seed industry executives and academic soybean specialists say that Monsanto was not planning to renew licenses for that Roundup Ready 1 trait that expired before 2014, so that seed companies would have no choice but to move to Roundup Ready 2. But in its letters this week, Monsanto said it would now extend all contracts for Roundup Ready 1 until the patent's expiration date. It also said it would not enforce language in some contracts that would have required seed companies to destroy or return Roundup Ready seed when the patent expired.

And Monsanto said seed companies could continue to sell seeds containing the Roundup Ready 1 trait without jeopardizing their access to the successor technology. Monsanto also said that after the patent expired it would allow farmers to save Roundup Ready 1 seeds from one year's crop to plant the next. Monsanto said it would not enforce other patents that might protect those seeds.

Many soybean farmers used to save seeds, but with Roundup Ready seeds they have been contractually obliged to buy new seeds each year. Monsanto has taken legal action against hundreds, if not thousands, of farmers it has accused of saving seed.

"This is a pretty big concession for Monsanto," said Shawn Conley, a soybean specialist at the University of Wisconsin, who said saving seed could save farmers a lot of money.

Still, it is uncertain how long Roundup Ready 1 would survive in generic form. Some nations require licenses for the import of genetically engineered crops to be periodically renewed. Monsanto said it would maintain those licenses through 2017. But if they expired after that, American farmers would not be permitted to export the Roundup Ready 1 generic soybeans to certain countries, which would discourage them from growing those crops.

Monsanto said it was confident that most farmers and seed companies would move to Roundup Ready 2, which uses the same bacterial gene but places it in a different location in the soybean DNA. Monsanto said that Roundup Ready 2 crops would have higher yields, and that other desirable traits would be added to those crops over time.

http://www.nytimes.com/2009/12/18/business/18seed.html?ref=science

Trusting Nature as the Climate Referee
By JOHN TIERNEY

Imagine there's no Copenhagen.

Imagine a planet in which global warming was averted without the periodic need for thousands of people to fly around the world to promise to stop burning fossil fuels. Imagine no international conferences wrangling over the details of climate policy. Imagine entrusting the tough questions to a referee: Mother Earth.

That is the intriguing suggestion of Ross McKitrick, an economist at the University of Guelph in Ontario who, like me, is virtuously restricting his carbon footprint by staying away from Copenhagen this week. Dr. McKitrick expects this climate conference to yield the same results as previous ones: grand promises to cut carbon emissions that will be ignored once politicians return home to face voters who are skeptical that global warming is even a problem.

To end this political stalemate, Dr. McKitrick proposes calling each side's bluff. He suggests imposing financial penalties on carbon emissions that would be set according to the temperature in the earth's atmosphere. The penalties could start off small enough to be politically palatable to skeptical voters.

If the skeptics are right and the earth isn't warming, then the penalties for burning carbon would stay small or maybe even disappear. But if the climate modelers and the Intergovernmental Panel on Climate Change are correct about the atmosphere heating up, then the penalties would quickly, and automatically, rise.

"Either way we get a sensible outcome," Dr. McKitrick argues. "The only people who lose will be those whose positions were disingenuous, such as opponents of greenhouse policy who claim to be skeptical while privately believing greenhouse warming is a crisis, or proponents of greenhouse gas emission cuts who neither understand nor believe the I.P.C.C. projections, but invoke them as a convenient argument on behalf of policies they want on other grounds even if global warming turns out to be untrue."

Dr. McKitrick is in the skeptical camp himself and has published critiques of the past warming trends reported at weather stations on the earth's surface (like the data now being re-examined after the much-publicized hacking of e-mail messages and files of British climate scientists). But he says that temperature readings from satellites and weather balloons are trustworthy enough to use for monitoring future trends.

Specifically, he proposes tying carbon penalties to the temperature of the lowest layer of the atmosphere (called the troposphere, which extends from the surface of the earth to a height of about 10 miles). He suggests using the readings near the equator because climate models forecast pronounced warming there.

These temperature readings could be incorporated into the kind of cap-and-trade system being negotiated in Copenhagen, which is intended to impose limits on the amount of greenhouse emissions. If the atmosphere warmed, the cap would be tightened to lower greenhouse emissions; if it cooled, the cap would be loosened.

But it would be even better, Dr. McKitrick says, to use the temperature readings as the basis for a carbon tax instead of a cap-and-trade system. Like many economists and environmentalists, he argues that the carbon tax would be more effective at reducing emissions because it is simpler, more transparent, easier to enforce and less vulnerable to accounting tricks and political favoritism.

The carbon tax might start off at a rate that would raise the cost of a gallon of gasoline by a nickel — or, if there were political will, perhaps 10 or 15 cents. Those numbers are all too low to satisfy environmentalists worried about climate change.

But if the climate models are correct, Dr. McKitrick calculates, within a decade his formula would cause the tax to at least double and possibly sextuple — with further increases on the way if the atmosphere kept heating. The prospect would give immediate pause to any investors trying to decide today what kind of cars, power plants and other long-range energy projects to finance. To estimate future profits, they would need to study climate.

"The best results will accrue to firms incorporating the most accurate climate forecasts into their decision making, precisely the kind of forward-looking behavior environmentalists want to encourage," Dr. McKitrick writes. "Consequently, it's not the case that we have to wait until it is 'too late' to respond to global warming. The market will force investors to make the best possible use of information and to press for improvements in climate forecasting in the process."

The revenues from a carbon tax might be refunded to the public, as Dr. McKitrick and others have suggested, or the money might be spent developing low-carbon energy sources, as recommended in the journal Nature by two economists from McGill University, Isabel Galiana and Christopher Green. After comparing different climate-change strategies for the Copenhagen Consensus Center, they recommend committing at least $100 billion per year to energy research and development by dedicating the revenues from a global carbon tax.

It would take some diplomacy to work out a formula for tying carbon penalties to temperatures — which temperatures to count, how much to weight trends. Some researchers question whether the tropical atmosphere is the best measure, and they fear that climate science could become even more politicized if it is directly tied to taxes. (For reactions to Dr. McKitrick's proposal, go to nytimes.com/tierneylab.)

But negotiating a temperature tax wouldn't necessarily be any more complicated or acrimonious than the emission cuts being debated in Copenhagen. Instead of arguing about the reliability of forecasts by computer modelers, instead of issuing competing prophecies, both sides would have to abide by what actually happens in the atmosphere. By starting off with a small penalty for carbon emissions, politicians wouldn't have to take the blame for imposing immediate pain on the public. The pain, if it came, wouldn't be felt until later — and at that point they wouldn't have to take direct responsibility anyway.

They wouldn't have to vote for higher taxes and utility bills. They could blame it all on Mother Earth, and she never has to worry about being re-elected.

http://www.nytimes.com/2009/12/15/science/15tier.html?ref=science

Trust firstborns to show their selfish side

- 15 December 2009 by **Shaoni Bhattacharya**

Magazine issue 2738.

Selfish traits are more pronounced in firstborn (Image: Cheyenne Glasgow/Getty)

FIRSTBORN children are more likely to achieve greatness, but this may come at the cost of a less trusting, uncooperative disposition.

We know that firstborns are generally smarter than their younger siblings and more likely to become leaders, while younger brood-members tend to be more rebellious. To see if trust in adults might also be affected by birth order, Alexandre Courtiol at the Institute of Evolutionary Sciences in Montpellier, France, paired 510 students with anonymous partners to play a finance-based game. Both players were given 30 monetary units and told that whatever they had left at the end of the game would be converted into real cash. Player A was told to give any sum of money to player B, with the knowledge that this would be tripled for player B's pot. Player B then had the option of giving any sum of money back to player A. The selfish decision would have been for neither player to give any money away, but less than 1 in 10 participants played this way. The more money player A gave away, the more trusting they were judged to be and the more money player B tended to return, showing reciprocity.

On average, eldest siblings gave 25 per cent less "money" than non-firstborns or only children, whether they were in role A or B. Courtiol interprets this as meaning firstborns were 25 per cent less trusting and reciprocating (*Animal Behaviour*, DOI: 10.1016/j.anbehav.2009.09.016).

Eldest siblings gave away 25 per cent less money than non-firstborns or only children He suggests there may be a limited amount of energy that people can invest in cooperative alliances, "so it may be that the firstborn cooperates less outside the family because they cooperate more within it".

A conflicting explanation is that within their families, firstborns actually cooperate less in an attempt to maintain their initial monopoly on parental care, and interact with others in the same way as adults. The study confirms that birth order can have significant and lasting effects on personality and behaviour outside the family, says Frank Sulloway, an evolutionary psychologist at the University of California, Berkeley.

http://www.newscientist.com/article/mg20427384.000-trust-firstborns-to-show-their-selfish-side.html

Pregnant women develop emotion-reading superpowers

- 14 December 2009 by **Linda Geddes**

Magazine issue 2738.

Primed to protect her baby (Image: Lisa Spindler/Getty)

RAGING hormones during pregnancy prompt mood swings, but may also lead to a heightened ability to recognise threatening or aggressive faces. This may have evolved because it makes future mothers hyper-vigilant, yet it could also make them more vulnerable to anxiety.

Previous studies have suggested that a woman's ability to correctly identify fearful or disgusted facial expressions varies according to her stage of the menstrual cycle, with perception heightened on days associated with high levels of the hormone progesterone. Since levels of progesterone and other hormones rise dramatically in late pregnancy, Rebecca Pearson and her colleagues at the University of Bristol in the UK investigated whether the ability to read faces varies during pregnancy.They asked 76 pregnant women to assign one of six emotions to 60 computer-generated faces before the 14th week of pregnancy, and again after the 34th week. Faces expressing happiness and surprise tended to be correctly assigned at both stages of pregnancy, but for faces expressing fear, anger and disgust, the accuracy rates were higher in late pregnancy (*Hormones and Behavior*, DOI: 10.1016/j.yhbeh.2009.09.013).

This may increase the chance that the woman will spot potential threats to her and her fetus, and prime her to be hyper-vigilant once she becomes a mother. But it could have a downside. Pearson points out that people with clinical anxiety are also better at identifying negative emotions in faces. Pregnant women aren't clinically anxious, but "they might interpret negative or emotional things around them in a slightly more sensitive way", she says.The finding builds on a recent study by Ben Jones of the University of Aberdeen in the UK who found that pregnant women - and women in stages of the menstrual cycle where progesterone levels spike - are better at identifying faces showing signs of sickness. "It's preventing them from becoming sick by interacting with people who are ill," he says.

The next step will be to examine whether pregnant women and new mothers are also more sensitive to emotional cues in babies' faces, Jones says.

http://www.newscientist.com/article/mg20427384.200-pregnant-women-develop-emotionreading-superpowers.html

Richard Wrangham: Cooking is what made us human

- 19 December 2009 by **Jeremy Webb**
- Magazine issue 2739.

What was the central mystery of human evolution that you were trying to solve?I was sitting next to the fire in my living room and I started asking the question, when did our ancestors last live without fire? Out of this came a paradox: it seemed to me that no human with our body form could have lived without it.

Why can't a human exist on the same diet as a chimpanzee? A chimpanzee's diet is like eating crab apples and rose hips. Just go into the woods and find some fruits, and see if you can come back with a full stomach. The answer is you can't. The big difficulty is that the nutrient density is not very high. This is problematic for humans because we have a very small gut, about 60 per cent of the volume it would be if we were one of the other great apes. We don't have enough intestine to keep low-quality food in our gut long enough to digest it.

So cooking provided some kind of a watershed for humans to split from our chimp-like ancestors?Yes. I believe the point at which our bodies show adaptation to cooking is 1.9 million years ago. The evidence is in the changes that took place when we evolved from ancestors that were like chimpanzees but were already standing upright. Cooking led to increased energy intake.

What was the result of having more energy? Maximising energy from food allowed us to lose a third of the large intestine and significantly expand our brain size. It affected our brain because humans were social and there was a premium on being as intelligent as possible in order to outsmart your opponents in competition, ultimately for mates.

So there's no physical proof of when cooking started? From archaeological evidence, people estimate anything from 50,000 years ago to more than a million years.

You say that cooking led to the division of labour between men and women How do you believe that happened? Cooking imposes a delay between collecting food and eating it, which means others could steal from the cook. I worked out a simple model of social relationships that would let a cook keep the food. It relied on having a dominant set of individuals, the males, and a subordinate set, the females, who would cook but be protected by the males. We see this in many tribal societies - women cook for their husbands. There are two rules: a woman is obliged to feed her husband every night, and she is not allowed to feed another man unless her husband is present. If the whole society signs up to these rules, women are protected from thieves.

You have been accused of male chauvinism. I'm just describing what happens, which is that women do the cooking in all societies except modern urban industrial ones. But that doesn't make me a supporter of it. I'm not saying it is what should happen today.

Profile

Richard Wrangham studied chimpanzees in Tanzania. He is a professor of anthropology at Harvard University and author of *Catching Fire* (Basic Books, $26.95/Profile Books, £15)

http://www.newscientist.com/article/mg20427390.200-richard-wrangham-cooking-is-what-made-us-human.html

Can Anybody Make a Movie for Women?
By DAPHNE MERKIN

I.

NANCY MEYERS may be a singular figure in Hollywood — may, in fact, be the most powerful female writer-director-producer currently working (not that there's much competition) — but that doesn't appear to give the 60-year-old blonde a whole lot of social clout. On a Monday evening in late October, for instance, it didn't stop the owner of Vincenti, a small, much-in-demand Italian eatery in Brentwood, from asking Meyers whether she would mind switching tables come 8 p.m. True, ours was a prime corner booth, and the owner, a fierce-looking woman with coal-black hair who would fit nicely into a Fellini film, assured Meyers that she was only being asked this favor because the person who requested the table was an investor in the restaurant. (He turned out to be Howard Weitzman, a lawyer whose clients have included O. J. Simpson and Michael Jackson.) But it still gave me pause. You know, the whole sexual-politics thing rearing its timeworn, fractious head: a powerful man trumps any woman. ("When you describe how influential I am in Hollywood," Meyers ruefully observed to me, "say we were thrown out of our booth.") As we got up to move at the appointed hour, John Burnham, an agent and executive vice president at International Creative Management and an old friend of hers who happened to be sitting at the table next to ours, expressed outrage on our behalf, offering to confront the owner personally. But Meyers just shrugged and laughed, stopping on our way to a table in deep steerage to trade hellos with the producer Jerry Bruckheimer.

I wondered at her sang-froid under the circumstances and whether it spoke to some enviable sense of imperviousness or to something more fragile. When I mentioned the incident weeks later to the producer Scott Rudin, who knows Meyers well, his verdict was that she lacks much feeling of entitlement. "She's not flush with her own importance," he said. "I think she expects to be asked to move tables." Indeed, I rapidly discovered that Meyers is one of those rare people in or out of Hollywood for whom power is not an end in itself but a means to an end — in her case, the ability to get films like "What Women Want," "The Holiday" and "Something's Gotta Give" made precisely as she envisions them. "My movies are not messed with by the studios," she told me with obvious pride. And it's true: Meyers has final cut on her films, a rare privilege for a director.

Meyers is not one for barking orders or for throwing her weight around; rather, she gets things done by virtue of her quiet bulldog tenacity. "For her work, she'll pull out all the stops," says James L. Brooks, the

veteran writer-director ("The Mary Tyler Moore Show," "Terms of Endearment," "As Good as It Gets"). Brooks has known Meyers since the late '70s, around the time she made her first movie, "Private Benjamin," as part of a team with her domestic and creative partner, Charles Shyer. (Although the pair were only officially married for three years, they have two daughters and had a series of hits over nearly 20 years, including "Baby Boom," "Father of the Bride" and "The Parent Trap," before they parted ways in 1998.) "She was the funny, smart girl in rooms full of men when I first met her," Brooks recalls. "She'll hit you with a cleaver, but gracefully." In other words, talk softly but carry a big script.

With her black-framed glasses and penchant for wearing clothes that seem like a softer variant of a man's business suit — white blouse, yellow cardigan over slacks, low-heeled patent-leather pumps — the petite and attractive Meyers might pass for a lawyer or professor; there's nothing about her that shouts V.I.P. She looks, rather, like the kind of woman who has always been cute and has always conveyed a certain approachability to men. Her jewelry is equally understated, as unblingy as can be, consisting of two gold rings and a gold bracelet. Everything about her suggests an innate tastefulness and the kind of self-image that isn't based on making a grand impression. Goldie Hawn, whose relationship with Meyers also goes back to the '70s, puts it this way: "Nancy has the clout. She doesn't have to own the clout."

Meyers's new film, "It's Complicated," will open on Christmas Day — itself a sign of high studio expectations. It goes up against such fare as "Sherlock Holmes" and "Alvin and the Chipmunks: The Squeakquel." The movie is in many ways a variation on the theme of "Something's Gotta Give" in its hyperattunement to the upper-middle-class zeitgeist, especially as concerns the unpredictable dance of the sexes and the ways in which the tempo can speed up when least expected. "What we have here is a terrific populist comedy," says a marketing executive at Universal. "It's a movie that reduces well to a 30-second TV spot." Meryl Streep is Jane, a professionally successful divorced mother of three who runs a flourishing Santa Barbara bakery and seems content to be on her own when romance sticks its big foot back in the doorway to her life. Jane is the sort of middle-aged woman other middle-aged women can relate to without feeling compromised; she's witty and good-looking and worries about her "saggy" left eyelid while at the same time, as the script has it, being the "type of person who kind of makes fun of people who get plastic surgery."

In the course of events, Jane discovers that her lawyer ex-husband Jake (played by Alec Baldwin) has fallen back in lust with her, no matter that he left her 10 years earlier for a leggy hottie with whom he is now trying to have a child. This being a Nancy Meyers movie, in which 55-year-old women implausibly exert charms that no 25-year-old can hold a candle to, Jane has also caught the eye of Adam (played by Steve Martin), the gentle, traumatically divorced architect who is remodeling her house. And this being a Nancy Meyers movie, men are as subject to critical scrutiny via the female gaze as women are subject to the male gaze. In one bedroom scene, instead of Jake's getting a chance to caliper Jane's body fat, she asks him to look away while she gets out of bed and rushes into a waiting robe: "The last time you saw me naked, I was in my 40s," she explains. "Things look different lying down." Meanwhile, Meyers allows Jane (and the audience) a full and lingering view of Jake's substantial paunch. All's fair in love and divorce, including Meyers's shifting the burden of living up to impossible, media-derived body ideals from women to men.

Meyers has directed and produced four movies (three of them under her own production company, Waverly Films, which is named after the theater where she saw virtually every movie of her childhood) — and is now paid upward of $12 million for each. This amount doesn't include her earnings as what is known in Hollywood as a "gross player" — someone who takes home a percentage of the film's profit over and above his or her salary. She is valued first and foremost for her track record at the box office; each of her post-Shyer movies has surpassed $200 million in revenue worldwide. Universal Studios, which has bankrolled her most recent effort to the tune of $80-odd-million, has high hopes for "It's Complicated," with its neonlit cast, idyllic settings and sophisticated yet accessible story line. (In a nice bit of synchronicity for the movie, Steve Martin and Alec Baldwin will host the Oscars this year.) Meyers is also paid for generating "creative value for the studio," says Jeff Berg, chairman of I.C.M. and her longtime agent. "Studios like to have success," Berg says, "and then they like to have the halo effect, whereby the films reflect positively on the taste of the studio."

It typically takes Meyers two years from start to finish to do a movie — a year for the writing, then six months for the shooting and another six for the editing. She is known for her obsessive, micromanagerial attention to detail. This aspect of her directorial style is appreciated by some and mocked by others but never fails to be mentioned when her name comes up. "She obsessed for two days over my makeup in a scene," Steve Martin says. "She thought it looked too light." Baldwin compares her meticulous, time-consuming approach with Scorsese's. "Everything that's in the frame is of concern," he says. " 'What's the book on the table behind you? Move those flowers. I don't like those sheets.' " Then there is her tendency to do multiple takes — something else that never fails to be mentioned when her name comes up. "There are a lot of takes," Martin confirms. "But I went into the movie determined not to let it affect me." Diane Keaton, who has worked with Meyers in four films, is quick to defend her: "Yes, she does a lot of takes. I say good. Gives you more options." Meyers has her reasons for doing what she does. "I don't shoot movies quickly," she says, "because I get a lot of coverage and a lot of angles, so we have all the pieces in the editing. I do a lot of takes, but it's because I'm looking for something." John Burnham, the I.C.M. agent, has a simpler, X-versus-Y-chromosome view of the whole thing. "If Mike Nichols said to do another take," he crisply notes, "there would never be any issue."

II.

MY FIRST ENCOUNTER with Meyers was at the Barbra Streisand Scoring Stage in the rear of the Sony Pictures lot in Culver City, where she was overseeing a scoring session for "It's Complicated." I very quickly got a sense of her almost terrifying ability to focus — to single-mindedly rise above the distractions around her. These included about 30 people, some wandering in and out, others sitting behind a long mixing board and a phalanx of computer monitors and others who just hung around in the back of the room, chatting or helping themselves to an underinspired buffet. The room was bristling with technology; one whole wall was covered floor to ceiling with recording equipment. Meyers was working on the soundtrack with Hans Zimmer, the film's composer, and a 35-member orchestra that was playing on the same glassed-in soundstage where Judy Garland recorded "Over the Rainbow." The German-born Zimmer, who has the confident yet playful air of an aging wunderkind — he has written the soundtracks for a number of Hollywood blockbusters, including "The Da Vinci Code" and "The Dark Knight" — came across as something of a handful, given to disappearing for 20 minutes at a time at odd intervals. He was a strange match for the methodical Meyers — "Nancy and I have a history of my starting late," he told me — yet clearly the two of them have arrived at some sort of modus vivendi. "It's nerve-racking," Meyers admitted. "I am the last person on earth who likes to do things at the end. I'm a big calendar girl. But he's so talented — besides being gifted, he's open — and the music is so critical. It's like another voice in the scene."

For the next two hours I looked on as Meyers painstakingly went over musical cues with Zimmer and his team, tweaking a bar ever so slightly here, revising a string of notes more decisively there to get at the exact sound she heard in her head. "Bar 6 through 27," she said in her authoritative yet undivalike manner. "The whole thing sounds like one crescendo. The piece should grow in intensity." And about a scene in which Streep asks Martin if he thinks she's too old for him, Meyers said: "She can do the heavy lifting of the line. Don't make it somber." Meyers, who loves Frank Sinatra (she sent him a fan letter proposing marriage when she was 12), Burt Bacharach and the Beatles, clearly regards this part of moviemaking as being as important as getting the right angle on a shot. She looked over at me, conscious that she might be seen as overly controlling, and quoted Truffaut: "Making movies is an accumulation of details." And a little later, she remarked that "directing redefines multitasking." As if to prove her point, she used the occasional 10-minute breaks in scoring to do everything from cleaning her hands ("How can you see a hand sanitizer and not use it?") to Skyping on her computer with her second-camera unit as it took establishing shots of the swing outside the house of Streep's character. "Get away from the chains," she instructed them. "Now raise it up a little bit . . . more. No, too high." It was late in the afternoon by now and everyone else appeared to be slowing down except Meyers, who hummed happily to herself.

Watching Meyers at her rigorous fine-tuning, I was struck by how deftly she got her point of view across without grinding anyone down in the process. Her editor, Joe Hutshing, who also worked with Meyers on "The Holiday" and "Something's Gotta Give," describes her manner as "very persistent — in an

encouraging way. If she's feeling differently about anything, she tries to coax you into giving her what she wants in a way that's not reprimanding or dictatorial." Indeed, in the two days I spent with her, one of her more noticeable traits was her friendly attitude toward various assistants. At one point, when she started to fall over the strap of someone's bag, she said, "Ooh," before catching herself and then apologizing to the bag.

It would be tempting to attribute Meyers's uninflated manner to her being female — to having been trained from birth in the art of the soft sell — except for the fact that she is more straightforward than girlish, more clear than coy. "She's just really smart and doesn't seem to be impeded by all the weirdness that everyone brings to whichever gender they are," says Helen Hunt, who starred in "What Women Want." "She must have had great parents. I can only assume she had great mothering." But with all that, there is no missing the fact that there is an iron will behind Meyers's velvet-gloved presentation; that she is what Jack Nicholson terms "an indomitable force." Nicholson, who worked with Meyers in "Something's Gotta Give" and refers to her as a "taskmaster" — he affectionately calls her "the chief" — says that he wouldn't put her directorship "on a gender basis." He recalls one argument he had with Meyers over a particular shirt he wanted to wear in the film that she objected to and he insisted on wearing all the same. "I still like the shirt," he grumbles genially into the phone, as though this little contest of wills just took place the day before. "It's a memorable shirt." All the same, given her apparent lack of hubris, it's easy to forget just how important a player Meyers actually is within the Hollywood system; aside from Nora Ephron, it is hard to think of another female director with as recognizable a cinematic imprint as hers, a certain look and feel that you can point to and credit, for better or worse, as uniquely hers.

III.

PART AND PARCEL of that uniqueness is Meyers's focus on making films that both feature and speak to middle-aged women, a demographic that studios traditionally ignore for fear of not bringing in the all-important opening-weekend numbers by which a movie's position is assessed and its future success seemingly foretold. The simple truth is that any movie that is not aimed at 15-year-old boys, who come out in droves on Friday night for movies like "Transformers," is seen as something of a risk. Movies like "It's Complicated" unfold at the box office in a different pattern than movies that are skewed younger; their success is based more on long-range playability and word of mouth than on instant impact. Still, in a movie culture consumed by youth and its trappings — vampires, werewolves, stoners and superheroes — Meyers's decision to pay attention to a part of the population that is often construed (and often construes itself) to be invisible stands out in bold relief. The fact that this decision has proved to be commercially shrewd says something about her instincts as a moviemaker but also says something about a previously unsatisfied hunger, composed of two parts daydream and one part hope, that is finally being addressed. "She's a pioneer with regard to representing older women," Diane Keaton said over lunch at the Beverly Hills Hotel. "She's the only one delivering the fantasy for women over 55. You're beautiful, charming and you get two guys instead of one."

Meyers, then, has rushed in where angels fear to tread to rescue the middle-aged and manless woman from her lonely plight. She has taken this sorry creature, who is bombarded with reminders of her vanished youthfulness everywhere she turns, and placed her in an alternate universe, where she is not only visible but desirable just the way she is. (It helps, of course, if she looks like Diane Keaton or Meryl Streep, and if she gets to wear a carefully chosen wardrobe of flattering clothes.) "Feminism didn't admit the longing for romance," Barbara Probst Solomon, a writer and critic, says. "And it also didn't admit that romance often didn't go with success. Her movies give women their reward — you feel nourished, the way you used to feel about old-time Hollywood movies. You're not just an old bag sitting with your laptop at the beach — you've got your prince. It permits you to have your fantasy." It is not unique, of course, that Meyers's vision of life is unabashedly romantic — call it retro or call it postfeminist — but what sets it apart is that she is putting it at the disposal not of unformed 18-year-old girls but of accomplished 50-something women for whom romance is generally no longer considered an option, either because they are too old or because they are too threatening.

In this sense she is proposing the somewhat radical notion that there are second acts in women's lives and that they don't necessarily hinge on being a desperate housewife in search of the next "It" bag or a cougar on the prowl. Far from it. The interesting thing about "Something's Gotta Give" and "It's Complicated" is that the women in them aren't remotely on the hunt, seeking proof of their sexual appeal in the form of studly younger men — or men their own age, for that matter. These women are self-sufficient and notably energetic. They may not have men, at least when we first meet them, but they make do with friends and children and siblings, for whom they whip up tasty dinners and homemade pies and laugh over their own situations. When men do appear on the scene, whether in the form of a babe-chasing player like Jack Nicholson's Harry or Alec Baldwin's renewedly impassioned Jake (or Dennis Quaid's Nick Parker in "The Parent Trap," for that matter), they awaken dormant desires that nevertheless have to be fit into pre-existing, busy lives. "It was a window into my future," says Elizabeth Hayt, a friend of mine in her late 40s who considers "Something's Gotta Give" to be a cultural lodestar, "and it gave me amazing hope that I was going to remain vital, sexy and, even more than that, desirable for my accomplishments to men of all different ages, statuses and backgrounds. It was everything that the image of the woman past her prime isn't."

Although Meyers claims that there's "nothing calculated" about these films, that they take her where they may go, in their own way they are as shrewdly aimed at an audience as any Judd Apatow slacker comedy. ("Go, go, go for the geezer set," is how the film critic Molly Haskell describes this niche.) There is no doubt they are lacking in discomfiting realism, much less gravitas. For one thing, unlike the strong roles that Garson Kanin and Ruth Gordon wrote for Katharine Hepburn as a successful working woman in "Adam's Rib" and "Pat and Mike," in which the workplace is a focal point for comedy, the jobs of the women in Meyers's movies are more gestural than fully conceived. (If writing hit plays were as easy as it is made to look in "Something's Gotta Give," we would all be doing it.) But then again, the classic '30s and '40s screwball comedies of Ernst Lubitsch and others as well as Billy Wilder's derivations — Meyers considers Wilder "the god on the mountain," as James Brooks puts it — were airy confections themselves, full of tinkling patter and sparkling interiors. What those earlier movies had that Meyers's movies don't was a certain knowingness; hers speak to a more naïve, homespun spirit.

It's possible to dismiss her movies, I suppose, by calling them postmenopausal chick flicks or to characterize her outlook as a "sitcom sensibility," as does the critic Richard Schickel. But in the end she's dipping deep into the bourgeois mainstream, with its longing for Oprah-like "closure," its peculiarly American belief in personality makeovers and its abiding love for granite kitchen counters. Her films work as well as they do because of her honed writing skills and well-crafted scripts. She has also mined a subtler subtext in her habit of picking male stars with a slightly misogynistic buzz to them, like Mel Gibson, Nicholson and Baldwin, and then having these stars "relearn" how to read women during the course of the film, realizing they may have been mistaken on the first perusal.

Her films, that is, tease out the conflicted, humorous heart of adult life, featuring grown-up men and women who have put a lot of living behind them; who may be divorced, are usually parents, have achieved a degree of professional success and the luxe lifestyle to go with it, but haven't yet figured out the relationship thing. They are about the convergence of collective anxieties (all men are looking for arm candy, all women expect too much) and specific idiosyncratic realities in the form of unzipped characters who speak directly to the audience's own fantasies and fears via dialogue that is often funny and sometimes very poignant. "She is one of the few," Berg, of I.C.M., says, "who has consistently understood the box-office power of her gender." Callie Khouri, who wrote "Thelma and Louise" and directed and wrote the screenplay for "Divine Secrets of the Ya-Ya Sisterhood," waxes more passionate. "Nancy inspires a tremendous amount of hope in me," she says. "She's defied the conventional wisdom that women are over — both societally and professionally — past a certain age. I root for her in the way I do for all women who are trying to sledgehammer a hole into the wall of an audience and an output that's almost exclusively male-dominated."

IV.

WOMEN AND HOLLYWOOD have long been an uneasy fit; since the start of the studio system in the 1930s, the main place you found a woman was in front of the camera, acting. But there has also been a tradition in place since the 1910s of women writing and editing for the movies. (Anita Loos wrote for D. W. Griffith; Frances Marion worked on about 200 movies starting in the midteens.) Today you will find female directors of photography, not to mention the fact that beginning in the ’80s, women increasingly found their way into the producer’s seat. The number of female writer-directors, however, remains relatively small, even in a year like this one, featuring as it does a clutch of movies directed by women (“Julie and Julia,” “Amelia,” “The Hurt Locker,” “Bright Star,” “The Proposal” and “An Education”). The fact remains that in Hollywood, the glass ceiling is more shatterproof than in many other industries, giving way only when the pressure of accumulated evidence is brought to bear. “There are about four women directors in the business,” Burnham cynically notes, “only two of whom are working.”

Even if Burnham overstates the case a bit, there is no denying that Meyers is that rarity, a commercially viable, continuously employed woman director. Much of this can be attributed to the unrelenting drive that she has shown since she was an adolescent. “I wanted to be something, I know that,” she says, before quickly amending herself. “I wanted to do something, not be something. I don’t know if it was any clearer for a long time than that.” But another important side to Meyers’s story — and one that might be a bit uncomfortable to grapple with if you, like Callie Khouri, tend to see Meyers as a beacon of hope for women in Hollywood — is that she did not always fly solo. Meyers openly credits her partnership with Shyer with paving the way for her to work on her own. “Being part of a team helped me so much,” she says. “I know the fact that there was a man in the room with me all those years made the medicine go down.” By the time the couple split in 1998, she was well established. “I had made the companies money,” she says. “I didn’t have to start, like a lot of women, from ground zero. My path was not the same as a woman starting out by herself.” Jeff Berg sees it similarly. “By making her partners lots of money, the gender issue in terms of employability went away,” he says. “For the studios, that’s the dispositive factor.”

The rise and rise of Nancy Meyers is a story with few hitches — a surprisingly organic tale propelled by talent, a bit of luck and a self-described “worker bee” ethic. Meyers grew up in the Drexel Hill, Pa., the younger of two daughters of doting Jewish parents in a largely Catholic neighborhood. (“There were 48 kids on my block. Two families had 12 kids each.”) The household was warm and comfortable, with a swimming pool in the backyard that served as the neighborhood gathering spot — “My parents loved being surrounded by family and kids and friends, so it makes perfect sense that they would have one put in” — and a basketball hoop over the garage. “See ‘Father of the Bride’ scene with Steve Martin playing basketball with his daughter,” Meyers wrote to me in an e-mail message. “That was me and my dad had I really been great at it.”

Her father, Irving, was an executive at a company that manufactured voting machines, and her mother, Patty, was a good cook who, according to Nancy’s sister, Sally, was the “go-to Mom, the leader of the Girl Scouts, the Brownies, the car pooler.” When she wasn’t busy being a mother and all-around do-gooder (she worked at Head Start and the Home for the Blind), Patty Meyers liked to strip and refinish the furniture she picked up at flea markets and antique shows. “She enjoyed dabbling in interior decoration,” Sally recalls. “It was a project house.” The sunniness of Meyers’s family life made a deep impression on Charles Shyer, who describes it as gemütlich and remembers that the first time he met Nancy’s parents, in Las Vegas, her father cuddled on the bed with his two grown daughters. “We went into the hotel room, and he held out his arms, and Nancy and her sister got under them,” Shyer says. “I thought, Geez, this is something I haven’t seen before. He was so sweet. They were so proud of Nancy, of us.”

In June 1972, after graduating from American University with a degree in journalism and spending a year working in public television in Philadelphia, she decided to move to Los Angeles. Six months earlier, Meyers visited her sister there and was instantly beguiled. “I just got out of the car and liked it,” she says. As she tells it, she arrived there on a Tuesday and on Friday she had a job. “I had no connections in show business,” she says. “I walked into the lobby of CBS with my pathetic little résumé and was sent up to see a game-show-producing company.” Meyers landed a job as a production assistant on “The Price Is Right”

and was assigned to help design prize packages, a position she injected with a bit of feminist spirit: "I said, 'No woman wants a washing machine' and tried to do more adventurous things than washers and dryers and microwaves."

After two years she quit her job and began to focus on writing. To support herself, she started a small cheesecake business — relying on a hand mixer and her neighbors' ovens. ("All the women in my family are great bakers," she says). When one of her restaurateur customers offered to help expand the business, however, she declined. "I really wanted to be a writer," she says. Ever enterprising, Meyers got a script into the hands of Allan Burns, a creator of the "The Mary Tyler Moore Show," who read it and invited her to sit in for a week to watch the process of putting together the show. "It never came to anything," Meyers recalls, "but it encouraged me."

Meyers was eventually hired as a story editor by Ray Stark, the famously hard-nosed producer. Although Stark was notorious for chasing his female assistants around the office, Meyers says he never made any advances, but then again, she insists, she wasn't his type. In any case, Meyers was fired, as she tells it, after she protested the fact that two writers were working on the same script without the other knowing. Eager to try writing, she worked on a pilot, but it was not picked up.

Her luck changed when she began to write with Shyer. The couple worked together in the late '70s when Meyers was a story editor in the film division at Motown. "We became very, very good friends for a couple of years before we started dating," Meyers says. "Our relationship started to turn when we worked together on a rewrite over a long Memorial Day weekend. It changed one evening. The lot was closed, and being on a movie lot at night was very romantic, like 'Sunset Boulevard.' " The pair, along with Harvey Miller, wrote the script to "Private Benjamin," the comedy that starred Goldie Hawn, then at the apex of her career, as a pop-eyed suburban princess who joins the Army after her second husband dies midcoitus. The screenplay was nominated for an Academy Award, as were Hawn and her co-star, Eileen Brennan; the film grossed nearly $70 million. Hawn, who along with Meyers and Shyer was an executive producer, refers to it today as "a big deal because women at that time weren't usually put in lead roles without a strong male counterpart." For her part, Meyers says that "everybody turned that movie down. Everybody. More than once. Women didn't usually have the lead in comedies. Goldie's agent had the script in his briefcase on a plane and made Robert Shapiro, a Warner Brothers executive, buy it." The movie still has an unexpected bite to it almost 30 years later, not least in its suggestion that happily ever after doesn't always mean riding off with some man on a white horse; it could just as easily mean roaring off on a motorcycle all by yourself, wearing a wedding dress that was now beside the point.

Meyers and Shyer were very much a duo, in parenting and in writing. "Our kids were always with us on location," Shyer told me, sounding nostalgic. They took their daughters, Annie, now 29, and Hallie, now 22, with them on the set as much as possible, hiring private tutors when the girls had to miss school. "When they were younger, Hallie would be in a little crib thing in the office," Shyer says. "That was our life. It included the kids. It would have been a very hard situation if Nancy had to be separated from the girls." They share credit for the screenplays of all of their films. To those who worked with them, they were so inextricably linked that, as Meyers recounts, people combined their names and called them "The Shmeyers." Still, it is worth noting that when Meyers directed one of their films in 1998, at age 48, instead of leaving that job to Shyer ("I was itching to do it a couple of years before"), the marriage fell apart. "We broke up around 100 people on the set of 'The Parent Trap,' " she says grimly, as if the memory were still fresh, and then adds of their decades-long union: "It was an unhealthy dose of togetherness." (For those who are interested in searching out clues to the life in the art, there is a kind of prescience about the difficulty of keeping a relationship of ostensibly equal billing intact in the pair's 1984 movie, "Irreconcilable Differences." It stars a very young and adorable Drew Barrymore as a little girl who takes her divorced parents to court because of their incessant feuding, brought on by their professional success as — wouldn't you know it — a screenwriting-directing team.)

Meyers claims she wasn't uncomfortable being part of a team for so long but also acknowledges that she feels "freed up" now that she is writing on her own. She and Shyer, who is remarried with 3-year-old twins (cut to Jake in "It's Complicated": "I've got three grown kids, and I'm going to kindergarten

interviews. Literally, I'm a walking cliché"), have remained friends and still help each other creatively. "We have a shorthand," says Shyer, who has gone on to write and direct the remake of "Alfie" and "The Affair of the Necklace. " "If you work together for that long, there are no preambles. You don't have to explain stuff. We just had the same emotional sensibility. We always had this rule: If one of us didn't like something, we'd find a compromise, a third way. Usually it would be better, an evolution of those ideas into a third idea. Since we had such similar tastes, it was a great chemistry."

You might wonder, given such symmetry, what caused the couple to break up in the first place, but on this subject no one is willing to say much other than Meyers's opaque reference to the divorce as having been mutually agreed upon. Scott Rudin, the producer who has known both of them for 25 years and who tried to persuade Meyers to direct "The First Wives Club" on her own even before she split up with Shyer, says they "paid a price" for being together all the time, but then adds: "They're not done with each other. How could they be? They have two children together. They're in each other's lives." Meyers, whatever official story she puts out there, seems hard hit by the divorce. "It's not a quick thing for women," she told me. "For men, it's pretty quick — because they recouple right away. Women don't." (Except, of course, in Nancy Meyers movies.)

Although Meyers asked me specifically not to question Shyer about his career since the two parted (he canceled our meeting in Los Angeles in favor of a phone conversation), a dispassionate observer cannot help noting that the couple have not done equally well since going their own ways. Meyers has clearly flourished, while Shyer has stalled; it's as though, in an inversion of the usual order of things, Meyers inherited the family franchise while Shyer got a new wife. Jeff Berg, who represented both of them when they were a couple and now represents only Meyers, says he thinks that their partnership reflected "a collective voice" and that the very idea of authorship is difficult to establish in the movies. Yet he also feels that Meyers's own voice has become "richer and more personal" since she started working independently. "Her scripts to me are driven largely by character," he adds, "as opposed to situation. The narratives are rich and detailed, but you walk away living in the character."

V.

AFTER MEYERS moved out of the house in Sherman Oaks where she and Shyer lived for 18 years, she finished building the dream home in Pacific Palisades they had started before the breakup. She based it on a Provencal farmhouse with a tile roof — "there's a detail along the tile edge," she says. Her search for the perfect beige paint color with patina went all the way to Australia, from where her contractor ordered so much of it that the company named the color they mixed after the street she lived on. She has used her own interior decorator, James Radin, on her last three films, along with a set designer, and patterned the spacious and inviting kitchen of "Something's Gotta Give" after her own kitchen. Her love of seductive surfaces — of rooms graciously adorned with bowls of flowers, glowing lamplight, color-coordinated pillows on the couch, pieces of art, books and touches of pleasing texture in the way of curtains, cashmere throws and rugs — is undoubtedly part of the allure of the upscale world she creates. (That world is also almost pre-ethnic — with the exception of the Asian actor B. D. Wong, who appears in "Father of the Bride" and its sequel, few non-Caucasian faces appear in Meyers's movies.) Although the Vermont interiors in "Baby Boom" had a cozy Norman Rockwell feel to them, the 1991 remake of the Spencer Tracy classic "Father of the Bride," starring Steve Martin, Keaton and Martin Short, was the first movie to introduce viewers to Meyers's trademark aspirational interiors (referred to as "architecture porn" by one disparaging poster on an Internet message board). The gorgeous white Colonial house on a leafy street commanded almost as much attention as the characters themselves. Steve Martin told me that he was initially startled by the look of the Banks family's residence, telling Meyers, "This is an awfully fancy home you're asking people to identify with." But he later realized that the emphasis was intentional. "She's creating an elegant world like in the '30s, when it was all Art Deco and butlers," he says. "It's really fun," he adds, only a tad defensively, "to look into a nice, beautiful world."

This aspect of her vision — its grounding in a particular "gracious home" aesthetic, where the quality of your character is attested to by the quality of your bed linens and where good taste stands not only for itself but for all that it excludes in the way of fast cars, moral turpitude, kinky eroticism and political

scandal — continued to grow stronger as her career progressed. The toniness of the surroundings was raised in "Father of the Bride Part II," in which the imminent arrival of Diane Keaton's late-life baby required the construction and decoration of a baby suite fit for a dauphin. I remember my young daughter watching the movie raptly over and over again, her eyes grown wide with wonder at the cunning beauty, the Lilliputian chic of the infant quarters. For the longest time we would have discussions as to how she would decorate her own children's rooms based on the grand vistas opened up before her by this cinematic version, where money was no object and no stuffed animal too large to house.

Meyers herself is unapologetic about creating sets that look as if they might be photographed in a shelter magazine, most notably the mouthwatering Hamptons house in "Something's Gotta Give," which did actually make an appearance in Architectural Digest. "The fact that there is nice fabric on the chairs is fun," she says. "It's appealing. It softens the message." When I ask her whether she has ever been criticized for spending so much time, effort and money on interiors, she recalls someone once describing her aesthetic as "the cashmere world of Nancy Meyers." Then, sounding like an auteur of the domestic sphere, she says: "I can't explain why I choose to do that. As long as we're building the interior of Jane's house from scratch, which we did, it's decorated that way because it's her style. I like that stuff."

Whether her insistence on "softening the message" through plush surroundings ultimately weakens the films — renders them more glossy and insular than they need be, even for a genre that is inherently fizzy — is a question I have debated with myself and others. Jeanine Basinger, chairwoman of the film-studies department at Wesleyan University, says that unlike Frank Capra, who believed that victory over something significant was essential for a comedy to be memorable, Meyers's movies don't require that you think about them again. "She makes it easy for the actors and the audience," Basinger says. "They can slip into their parts and be happy, and we can slip into our seats and be happy." But Scott Rudin, a producer of "It's Complicated," suggests that Meyers's sets don't serve merely as well-appointed backdrops; they convey essential details of character. "Everything — the silverware, the food in the fridge — is part of the narrative," he says. "I've seen Nancy walk around the set and change the books on the shelf because she doesn't think the character would read them." When I ask him about the high-thread-count quality of the fittings, Rudin insists that they are "accurately describing the people she's making movies about. We had a lot of conversation about the size of Jane's house. Her bedroom is a small bedroom and her kitchen is a small kitchen that's falling apart. She's saved for 10 years to change it. Nancy's worked hard to justify the plot." (When I saw a preview of the film, both my companion and I thought the kitchen looked pretty good as is, but then again, square footage plays differently in Manhattan than it does in Santa Barbara.)

What is clear is that Meyers doesn't like shadows — metaphorical or real ones. So it is that on a Tuesday morning she is to be found in the editing room with Joe Hutshing, making like a one-woman clean-up squad. "Can you get rid of this dot, this dot and this dot," she instructed an assistant editor, pointing out infinitesimal, invisible-to-the-human-eye blurs on the screen. A little later, as she and Hutshing went over shots of the backyard view of Streep's house (they created a water view where none existed), she wanted all the dead trees edited out. Then it was on to the spiky plants. "Every plant that is spiky is removed from this movie," she announced, a note of hard-won triumph in her voice. "You have no idea. Keep it all soft."

Indeed, keeping it all soft without going out of focus altogether seems to be one of Meyers's specialties. It may be an instruction meant to apply to only the landscaping, but it is no giant leap to divine that she feels the same way about all aspects of her films — including, more and more of late, their ultimate message, which seems to suggest that fish can learn to ride bicycles. You can be an independent woman, that is, and have a man who has been brought to his senses in time to appreciate you — a woman who arouses, but even more important, understands him. It is undoubtedly a tribute to Nancy Meyers's savvy that she has figured out how to smuggle in oddball touches and eccentric nuances into movies that otherwise might play as resoundingly mainstream, and she has clearly learned something from the screwball comedies she so admires about the desperation that underlies humor.

Still, despite the glimpses of subversiveness — her willingness to tackle Flomax, Viagra, involuntary celibacy and the other less quaint aspects of sex and love for the over-50 set — her films can hardly be said to be gritty. Even though they are rife with the long-term effects of divorce on the partners involved and on their children as well, she believes in the possibility of hearth and home — the unimploded nuclear family — with more fervor than almost anyone now making movies, even if she alludes to them only through their absence.

The more I talked to Meyers the more I realize that she prefers for her movies — for life itself — to have a rosy, unconflicted presentation. My sense is that whatever warts exist, she airbrushes out, the better to come away with a happy ending. (Her friends warn her off films that are too bleak. "People are always protective of me when they give me movies to see," she said. "They think I'm going to break.") At worst, her films can give off an air of tidy unreality — and it is this unexamined aspect, I think, this failure to even hint at darkness, that most fuels critical ire. Richard Schickel condemns Meyers with faint praise, hinting that she and the studios have struck a devil's pact of sorts. "Clearly there is an audience for sweet little middle-class romances of the kind she makes, and it pleases the studios to indulge a woman, whom they would not trust with more vigorous projects. It's as if they're trying to say: 'Hey, we're not sexists. We make Nancy Meyers movies.' "

As part of the audience for whom these "sweet little middle-class romances" are intended, I must say I find this assessment, whatever its kernel of truth, a bit harsh. For one thing, romantic comedies are harder to write than they appear. Sherry Lansing, former chairwoman and chief executive of Paramount Pictures, who championed "The First Wives Club" and tried for years to develop a script called "The Older Woman" without much success, says it is a genre that is "unbelievably difficult to get right." For another, what's wrong with a little wish fulfillment? It might be said that Meyers, who has not remarried and is currently involved with, as she puts it, "my movie," has spun gold from the hay of her own losses, turning the painful aftermath of divorce into comedies where she, in the form of her characters, gets to call all the shots.

The middle-aged woman as dream icon: lovable, desirable, unleavable. What's not to warm to about that? I would love to be able to reshoot some of my own life and relationships — and it wouldn't be half-bad if Alec Baldwin played the role of my ex-husband. We all run what-if scenarios over in our head, and part of the pleasure of this kind of entertainment is the way it lets us roam through our own imaginations as we follow the retakes Meyers's movies offer us. Given the high divorce rate and the equally high failure rate of second marriages, I'm guessing her latest movie will bring in crowds of grown-ups eager to see their own miscalculations and missteps played out on the large screen against a backdrop anyone would be proud to call home. "It's Complicated" may not be entirely believable — nor "Something's Gotta Give" particularly persuasive — but they offer their creator and all the women who relate to her stand-in self, in the form of Keaton or Streep, a good deal of laughter to help get them through the night. And that's no small piece of magic.

Daphne Merkin is a contributing writer. Her last cover article was about her struggle with chronic depression. She is now writing a book on the topic.

http://www.nytimes.com/2009/12/20/magazine/20Meyers-t.html?_r=1&th&emc=th

When Does Death Start?
By DARSHAK SANGHAVI

Robin Beaulieu was telling me about her daughter's bike accident. It was an event that would force Beaulieu not only to confront the death of her child but also to embrace a new way of dying. We were sitting last spring in the kitchen of her small apartment in Manchester, N.H. Beaulieu took a drag on a Marlboro, poured a cup of coffee and told me that her daughter, Amanda Panzini, had been a rambunctious, bighearted teenager. She loved animals, even "flea-ridden, mangy dogs," Beaulieu said, and was a fiercely loyal friend. When confronted by the possibility of donating her brain-injured daughter's organs after the accident, Beaulieu never doubted that Amanda would have wanted them to go to someone who needed them. But Amanda first had to be declared dead, and in her case, the only way that could happen was if her parents chose a precisely choreographed death — one conducted by medical personnel in a hospital procedure meant to allow Amanda to die while preserving her organs. From this, the doctors and Beaulieu hoped, would come new life.

The last time Beaulieu talked to her daughter was on the morning of June 21, 2008, a Saturday. Amanda attended an eighth-grade dance the night before; she told her mother that she had her first kiss there. After Beaulieu left for work at a nearby minimart, Amanda decided to ride her bike a few blocks to her friend Kate's house. She didn't take her helmet. At the crossing of Taylor and Young Streets, a Ford F-150 pickup truck slammed into Amanda and threw her into the street. When the paramedics arrived, Amanda wasn't breathing. They inserted a tube into her windpipe and rushed her to Elliot Hospital nearby. Beaulieu received an emergency call at the minimart; the paramedics had identified Amanda by the name engraved on her iPod.

The rest of the afternoon passed in a harrowing blur. Beaulieu remembers a concerned doctor trying to prepare her to see Amanda. She remembers seeing her child's swollen face in the emergency room and then being loaded with her onto a trauma helicopter for transport to Children's Hospital in Boston. Though the lighted monitors showed stable vital signs, Beaulieu sensed, as she hovered in the sky, that her child had died. Doctors in Boston performed emergency neurosurgery to decompress her skull, but it was not successful. Amanda was then admitted to an intensive-care unit and put on life support. Monica Kleinman, the clinical director of the unit, examined Amanda the next morning. The girl's cerebral cortex — the part of the brain where desires, fears and hopes are created — was irreversibly damaged. In her 20 years of practice (I worked with her as a pediatrics resident years ago), Kleinman has treated dozens of similar injuries. Few of these patients ever left the hospital; those who did were in vegetative or otherwise neurologically devastated states.

Beaulieu, Kleinman recalls, digested the news and "immediately got it." Amanda was never coming back. Beaulieu decided to take her off the ventilator and asked to donate her daughter's organs. But there was an obstacle. When Kleinman examined Amanda, she noticed that some primitive and reflexive neurons of the brainstem were still working. Amanda gagged a bit when the back of her throat was tickled, and one

of her pupils budged slightly when a flashlight was shined on it. The significance of this information was immediately apparent to Kleinman: Amanda was not brain-dead.

Organ transplantation must abide by the so-called dead-donor rule: a person has to be declared dead before any vital organs can be removed. Yet organs have to be alive if there is any hope of successful transfer to a recipient. Medical professionals have handled this paradoxical situation — finding a dead body with live organs — by fashioning a category of people with beating hearts who are said to be brain-dead, usually after a traumatic head injury, and who are considered just as dead as if they had rigor mortis.

To diagnose brain death, doctors typically go through a checklist of about a dozen items, including assessing reflexes like blinking, coughing and breathing, which are all controlled by the brainstem. The criteria are extremely strict, and only a tiny fraction of severely brain-injured people meet them. Kleinman realized that Amanda, despite her severe brain damage, was not one of them. There was, Kleinman told Beaulieu, another option — one that was still controversial and had never been pursued successfully at Children's Hospital. The procedure was called donation after cardiac death, or D.C.D., and it would exploit the other way the law defines death: as the "irreversible cessation" of the heartbeat.

D.C.D. requires doctors to confront the shadowy question of exactly when somebody dies after the heart stops. To authorize D.C.D., doctors must follow a strict procedure. Amanda would be taken, technically alive, to an operating room, where her breathing tube would be removed. If her breathing ceased naturally and her heart stopped quickly (within an hour), she would be moved to an adjacent operating room and Kleinman would count off precisely five minutes, during which time Amanda would be prepped for surgery with antiseptics and surgical drapes, while Kleinman carefully watched for signs of a returning heartbeat. If there were none, Amanda would be declared legally dead; the stoppage would then be considered "irreversible." Before her organs were seriously damaged by the lack of oxygen (every minute counts), the surgeons would rapidly open Amanda's torso and remove them for transplant.

There was a chance none of this would work. If the comatose girl didn't stop breathing in the operating room, she would be returned to the intensive-care unit, though not put back on life support. Once taken off the ventilator Amanda would most likely die, but it might take hours or days, during which time her organs would deteriorate and would be unfit for transplantation.

Four days after Amanda's accident, Beaulieu and Amanda's father, Dan Panzini, sat in a darkened operating room and said their goodbyes as Amanda was disconnected from her ventilator. To Beaulieu's relief, she didn't breathe on her own, and her heart gradually slowed. "Amanda's heart has stopped," Kleinman soon said. Amanda's heart never started again, and the surgeons took her liver, kidneys and pancreas.

In procuring organs from patients like Amanda, doctors have created a new class of potential organ donors who are not dead but dying. By arbitrarily drawing a line between death and life — five minutes after the heart stops — they have raised difficult ethical questions. Are they merely acknowledging death or hastening it in their zeal to save others' lives?

With modern technology like respirators and tube feedings with synthetic formulas, Beaulieu might have kept her unconscious, brain-damaged child alive indefinitely. But as she sipped coffee in her apartment from a mug reading "#1 Mom," Beaulieu told me that if Amanda had lived, she could "never bike, rollerblade or go out with friends, and she'd never want that." If people with no hope for meaningful recovery can be kept alive artificially, shouldn't they also be permitted to die artificially?

Since the inception of organ transplantation a half-century ago, defining death has taken on both medical and ethical urgency. Before Joseph Murray performed the world's first successful kidney transplant in 1954 and showed that organs could be put to productive use outside their original host, doctors waited until the deceased was blue and stiff to declare death. Identifying a precise moment of death was a

diversion for eccentric researchers like Duncan MacDougall, who, in the early 1900s, placed dying patients on a scale in order to determine when death occurred: the moment they lost three-quarters of an ounce, the presumed weight of the soul.

The paradox of needing a dead donor with a live body was first addressed in 1968. Henry Beecher, a Harvard anesthesiologist and medical ethicist, convened a 13-member committee to write a definition of "irreversible coma," or brain death, for The Journal of the American Medical Association. Not everyone accepted the four-page report's conclusions. After Norman Shumway, a Stanford University surgeon, performed the first American heart transplant from a brain-dead donor, he was threatened with prosecution by the Santa Clara County coroner. As a result of the widespread disagreement over the meaning of "brain death," President Jimmy Carter asked a blue-ribbon commission to examine the issue. The commission culminated in the Uniform Determination of Death Act in 1981, which defined death as "irreversible cessation of all functions of the entire brain, including the brainstem." The procedure to diagnose brain death, however, was never codified into law, and as a result, it varies from hospital to hospital. In 1987, the nation's pediatrics authorities tried to standardize the diagnosis, listing 14 different criteria to confirm brain death, like the absence of reflexes, and requiring, under certain conditions, additional X-rays and tests for brain-wave activity. Last year, in the journal Pediatrics, researchers from Loma Linda University reported that of 277 brain-dead children in California who were referred to the regional organ bank over many years, only a single child received the full set of diagnostic tests.

In 2008, a young Oklahoman named Zack Dunlap was declared brain-dead after an all-terrain-vehicle accident and was considered for organ donation. Then, suddenly, he recovered. He later appeared on NBC's "Today" show. The precise medical details of the case are not public, but it is possible that a diagnostic error was made because a checklist was not followed. Dr. Wiley Hall, the director of neurocritical care at the University of Massachusetts Medical School, where I am the chief of pediatric cardiology, told me about a similar case last year in Massachusetts; it turned out that a brain scan had been performed improperly.

Such sloppiness is potentially tragic, but it is also exceedingly rare. Whether or not a checklist is followed, by the time a neurologist is consulted to assess a critically ill patient for brain death, the odds of recovery are already minuscule. Doctors see that these patients have begun dying, and the uncertainty is not about whether it will happen but when. The families of dying patients often realize this, too, and ask to donate their relative's organs. Dr. Robert Truog, a professor of medical ethics at Harvard Medical School, says he believes this is a situation where "all the ethical vectors are lined up," since the patient's family, the doctors and the recipient's family all want to proceed with organ donation. The holdup is that the patient is not legally dead.

The current shortage of organs gives urgency to any new avenue for donation. The United Network for Organ Sharing, a nonprofit, coordinates the nation's system of organ transplantation. Its Web site maintains a continuously updated count of people waiting for transplants. As of early this month, 105,172 men, women and children were in line. On an average day, the organization estimates, 18 people on the list die because they don't receive an organ in time. Despite widespread campaigns to encourage donation, availability has changed only modestly over the past decade — last year there were fewer than 8,000 deceased donors — while waiting lists have doubled in size.

The small number isn't because of refusal — to give one example, 85 percent of eligible brain-dead patients' families in central Massachusetts chose to donate last year — but because of the rarity of brain death. According to Kevin O'Connor, a senior vice president at the New England Organ Bank, improved public-safety laws — automobile safety belts, bicycle helmets — along with fewer violent crimes, have meant there simply aren't many people showing up in hospitals with severe head injuries and otherwise healthy bodies. At the University of Massachusetts, 238 people were on a transplant waiting list last year, yet our medical center, a leading source of donated organs in the state, recorded only 19 deceased donors.

A lack of organs because of better safety and lives saved is, unquestionably, a good thing. But it means that transplant doctors and patients are forced to think beyond brain-dead donors. The 1981 Uniform

Determination of Death Act also defines death as the "irreversible cessation of circulatory and respiratory functions," which left an opening for another source of donors. In 1997, the federal government asked the Institute of Medicine, an independent advisory body, to gather experts to determine how a dying donor might be treated. The experts ended up endorsing the procedure for donation after cardiac death, in which death occurs through a process of withdrawing life support and allowing the heart to develop "irreversible cessation."

There were two crucial conditions. First, families could not be pressured to stop life support; they had to come to the decision on their own, in consultation with their relative's doctor. No member of the organ-procurement team could participate in the family's decision or declare death. Second, "irreversible cessation" of cardiac function meant that at least five minutes had to pass without a heartbeat. That interval was arbitrary — the panel of experts made no reference to supporting research — and they admitted that "this recommendation is only an expert judgment."

The Institute of Medicine created a new class of potential organ donors: living patients with little hope of recovery who could be declared dead soon after life-support removal. Within a decade, the number of such donors increased tenfold; they now account for 8 percent of organ transplants nationwide, up to 20 percent in certain areas. Still, many hospitals were slow to adopt the practice.

The case of Children's Hospital in Boston is instructive. In 2005, Children's convened a 17-member task force of doctors, lawyers and health care professionals to explore the ethics of allowing D.C.D. After two years of regular meetings, the group was unable to reach a consensus. "The more we talked about it, the more polarized we became," recalls Dr. Peter Laussen, a committee co-chairman. Supporters of D.C.D. argued that the practice was legal and compatible with families' wishes. Those opposed worried that caregivers would see critically ill patients merely as organ donors, and their end-of-life care could be compromised.

At a certain point in the committee's debate, members were asked to mark where they stood on D.C.D. on a continuum, with one end signifying "totally disagree" and the other "totally agree." The participants almost uniformly chose one extreme or the other. There was no middle ground. And then a few days before Christmas in 2007, an 8-year-old girl named Jaiden Tlapa ended up in the Children's Hospital intensive-care unit.

The snow was coming down quickly in Milford, N.H., and school had been canceled. Holleigh Tlapa baked cookies for her three children, and then they decided to play outside. There was a path to the yard, and Holleigh got out the snowblower to clear it.

I visited Tlapa last April. As she started telling me what happened that day, her voice cracked. She got a box of tissues and continued talking. She had started the snowblower and the powder began flying. Then — she doesn't know exactly what happened — Jaiden somehow lost her footing and fell into the path of the blower. Instantly, Jaiden was pulled into the powerful machine, and the strings from her hood tangled tightly around her neck. Tlapa couldn't free her daughter no matter how she struggled and pulled. Frantic, she called 911. It seemed like an eternity before the paramedics arrived. It took them several minutes to cut Jaiden free. Placed on a respirator, the comatose child was later taken by ambulance to Children's Hospital in Boston.

For a moment on Christmas Eve, Jaiden opened her eyes, but her parents recall that they were "vacant." She never opened them again. The weeks rolled by. Repeated brain scans showed severe brain shrinkage. Despite her devastating cortical injury, however, Jaiden had a few primitive brainstem reflexes that kept her from being classified as brain-dead. "She looked normal, so you would assume consciousness, but that was misleading," Tlapa told me.

Over time Holleigh Tlapa and her husband, Paul, realized Jaiden wouldn't get better, and they asked about organ donation. Because she wasn't brain-dead, D.C.D. was the only option. Although the task

force at Children's disagreed about D.C.D., the hospital drafted a protocol. The Tlapas were told about the disagreement, but they chose to proceed. On Jan. 13, 2008, a dying but not dead organ donor was brought to the operating room and prepped for withdrawal of support for the first time in the hospital's history. Holleigh and Paul lay in their daughter's bed and played Jaiden's favorite Miley Cyrus song as the breathing tube was removed. They held their daughter and waited.

There's something remarkable about such families. I've known hundreds of parents whose children are stricken by terrible diseases. For many, the gravity of the situation is so overwhelming that they withdraw into themselves, letting no emotion escape, and then suddenly explode into a supernova of blame and anger. But there are others on whom this terrible pressure exerts a metamorphic power that turns some of their sadness into a compassion that is strong and diamond-brilliant.

Though her gasps were irregular, Jaiden didn't stop breathing entirely. After an hour her heart hadn't stopped, and, in this situation, the hospital protocol called for the patient to be returned to the intensive-care unit. The chance to donate her organs was over. Jaiden continued to take shallow breaths into the next morning, and then her heart finally stopped. She was legally dead. "It was so hurtful that she died so soon after," Tlapa said, disappointed that Jaiden's organs died with her. Still, she finds solace in knowing that Jaiden at least helped change some attitudes among skeptics and paved the way for the first successful D.C.D. procedure at Children's Hospital — the one involving Amanda Panzini. (Holleigh also founded a charity to help families facing similar decisions.)

Paul has some difficulty understanding why, if Jaiden was going to die anyway, she could not have been put under general anesthesia, undergone surgery to donate her organs, and then been declared dead. Removing the breathing tube to attempt D.C.D. had the same effect, only it took much longer and Jaiden breathed irregularly for many hours, which seemed to Paul more distressing. "If it was all up to me," he explained, "I would have said, 'Take her organs.' "

As Gary Greenberg wrote in The New Yorker, donating organs in such a manner, deliberately and with anesthesia, could simply be "a particular way to finish our dying, at the hands of a surgeon, after some uncertain border has been crossed." But Francis Delmonico, a professor of surgery at Harvard Medical School and a national leader in organ transplantation, fervently defends the need to establish death before removing organs. "I understand a family's anguish and inability to have consolation when a child doesn't die after removal of life support," he explains, "but I don't see this as a patients'-rights issue. It's a matter of public trust in the system."

Donation after cardiac death already arouses suspicion. Just as transplant surgeons like Norman Shumway were once harassed for procuring organs from brain-dead donors, a California-based surgeon, Hootan Roozrokh, was tried for dependent-adult abuse, a felony, after participating in an attempted D.C.D. A nurse who objected to the proceedings later registered a complaint about how painkillers were administered to the patient. Prosecutors charged him with trying to hasten the patient's death. Though none of this held up in court — Roozrokh was acquitted last year — the trial left many transplant surgeons shaken. Just think of the outcry, Delmonico cautions, if families and doctors also decided it was acceptable to euthanize patients to procure their organs. "You would destroy organ donation in this country," he said.

Delmonico certainly has a point about the importance of maintaining the public's trust, but it's hard to witness an actual D.C.D. procedure without conceding that the process of declaring death in any setting is inherently arbitrary. I saw this myself when I was permitted to observe a D.C.D. procedure at the University of Massachusetts hospital. The patient was a middle-aged woman with no close family ties who had been committed years before to a psychiatric hospital. Found unconscious after choking on French toast, she received CPR and came to the UMass intensive-care unit. She remained comatose with severe brain injury for days but was not brain-dead. Following hospital regulations, the doctors reported an "impending death" to the New England Organ Bank, which agreed she would be a suitable donor. (These reports are mandatory, on the theory that they ensure no donation opportunities are missed.) Faced

with the grave prognosis from the woman's doctors, her state-appointed guardian consented to donation after cardiac death.

The woman was wheeled to the step-down unit next to the operating rooms, prepped for surgery and covered with sterile sheets. With a medical student, a representative from the organ bank and me looking on, a nurse practitioner from the intensive-care unit supervised the removal of the breathing tube at 9:16 p.m. The patient didn't breathe. We gazed intently at the portable monitor at the foot of her bed, which showed her heart's electrical rhythm, oxygen level and blood pressure. By 9:18, her oxygen level fell from 95 percent to 60 percent. By 9:21, the oxygen level fell further to 22 percent, but her heart rate stayed normal at 74 beats per minute. At 9:25, her blood pressure dipped a little, her oxygen level was zero — which meant her blood was becoming acidic and possibly harming her organs — but her heart rate was still 62 beats per minute.

Watching someone die, observing her heart struggle and ultimately fail over the course of a half-hour, brought home how death occurs in its own way, at its own idiosyncratic pace. There is no escaping the tragedy of the moment. I thought about Jaiden and Amanda, and their stories together with this woman's seemed an endless loop of sorrow.

At 9:32, the woman's heart still beat 60 times per minute, though she was blue and unresponsive. At 9:38 her heart rate was 20, and then she flat-lined. Immediately, a stopwatch was started to count the five minutes before death could be declared.

The woman was wheeled to the operating room, where the surgeons were assembled. Three minutes passed without any heartbeat, and then four, then four and a half. There was silence. It was the nurse practitioner's sole responsibility to declare death without any interference from the transplant surgeon. Suddenly, there was a single blip on the heart monitor. The blip was almost certainly an artifact of some outside electrical interference and not a true heartbeat, but it was hard to tell for sure. Five minutes had passed, and every delay meant the organs were more starved for oxygen.

The nurse practitioner hesitated as she considered whether to call the death or restart the five-minute count, and then she made her decision. She looked at her watch and called out, "Time of death was 21:44." A flurry of activity began as the surgeons called for their instruments and the operating room sprang to life. There was no anesthesiologist at the head of the bed, so I stood there as the team prepared to make the incision. Suddenly, Dr. Adel Bozorgzadeh, the attending transplant surgeon, raised his hands. "Let us take a moment of silence and consider the gift that is being given on this day," he said. A few seconds passed. Then he brought the knife down.

Like Amanda Panzini, the teenager hit by the truck, the patient I observed bequeathed several abdominal organs, but not her heart. Although the liver and kidneys are relatively hardy and can withstand the five minutes of oxygen starvation before removal, the wait seriously damages the more delicate heart and renders it unusable. Heart transplants thus call only for brain-dead donors, whose hearts are still beating until just moments before they're removed.

This, it was thought, was the only way to get a viable heart. But a pediatric cardiologist named Mark Boucek at Denver Children's Hospital was growing tired of watching young children with incurable heart defects die. In 2004, financed by a federal grant, Boucek wrote a far more aggressive D.C.D. protocol that would save the heart, which was adopted after going through the hospital's review process. His version had two key innovations. First, large intravenous lines would be placed in the donor's groin before death, to enable the donor's entire blood volume to be replaced with a refrigerated salt preservative when it was time to remove the heart. Second, and most controversially, Boucek, who has since died from pancreatic cancer, rejected the five-minute rule imposed by the Institute of Medicine and initially picked three minutes instead; after all, no law had codified a particular time period. But David Campbell, the pediatric cardiac surgeon at Denver who procured the first heart using the protocol, realized that even three minutes was too long. "When we opened the chest and pericardium, the heart was distended and blue," he told me. Upon transfer to the recipient, the heart failed to work well initially and required the child to remain on a

dangerous heart-lung bypass machine for several days. “That’s why I asked that we move the time down lower,” Campbell said. In reviewing the medical literature, Boucek found the longest recorded time that a heart had ever stopped and then spontaneously restarted without medical intervention was 65 seconds. If the law required “irreversible” cessation of heart function, Boucek concluded, there was no reason to wait much longer than that. Waiting just over a minute after cardiac arrest to declare death was unprecedented. Last year, when the Denver specialists published their provocative case reports in The New England Journal of Medicine, many observers assailed their work and called it a back-door method of performing euthanasia. Robert Veatch, a professor of medical ethics at Georgetown University, calls the Denver doctors “lone wolves,” and he categorically rejects heart transplantation using D.C.D. because he maintains that a donor heart cannot have “irreversible” cessation. After all, it works fine after it’s transplanted. Veatch is especially concerned about a potential public outrcry against organ donation. “I spent all morning today dealing with conservative right-to-life scholars all worked up about stem cells,” he told me recently, adding that he could only imagine their reaction to taking hearts from “helpless little babies.”The first baby whose heart was donated under the much-shortened wait period was a newborn girl named Addison Grooms in 2007. Her parents, David and Jill Grooms, have no tolerance for Veatch’s viewpoint. Addison’s brain was severely damaged in a complication from delivery. “There was no chance at all that our daughter was going to survive,” says David, whose brother died of a malformed heart as a baby. “I can follow the ethicist’s argument, but it seems totally ludicrous.” Had the couple found out another child died because they weren’t allowed to donate Addison’s heart, it would be “like another slap in our faces.” Further, both parents would have permitted simply taking out Addison’s heart under complete general anesthesia — without the intermediate process of the choreographed death — which would have been a painless way to end their child’s life, had it been legal.

Three months after Addison’s death, a neuroscientist named Lori Driscoll gave birth to a son, Liam, with a catastrophic injury similar to Addison’s, and he was also transferred to Denver Children’s. Testing showed that almost every part of Liam’s brain was destroyed, though some primitive reflexes remained. Lori and her husband consented to Boucek’s novel protocol. They accompanied Liam to the operating room, where the breathing tube was removed. They held his hand for 10 minutes until his heart stopped.

Moving past a binary concept of life and death is, for most of us, an uncomfortable process. It’s worth considering how various cultures think about the beginning of life. Tibetan monks believe a new life begins around the time of a mating couple’s orgasm; many Catholics posit that it starts at the union of an egg and sperm; Roe v. Wade effectively established a legal threshold of life at 24 weeks of fetal gestation; some consider meaningful life to begin at birth; the Navajo think a baby is fully human when it laughs for the first time. If the emergence of life occurs on a continuum, perhaps the same is true of life’s recession. Still, preserving the notion that the transition from life to death can be clearly defined may be a fundamentally necessary fiction. Though no religious organizations or right-to-life groups have yet mounted any opposition to D.C.D., including the Denver protocol, it is important to change practices in deliberate steps that give decision makers clear rules of action and establish gradual consensus. Lori Driscoll, for one, is grateful for the changes Boucek made to the D.C.D. protocol. After her baby Liam died, she was told that a 3-month-old girl received his heart. That infant was prepped for surgery for her new heart in the room adjacent to the one where Liam died. The surgery went well. Months later, Driscoll learned that recipient was a girl with the uncommon first name Annika. She did some sleuthing and found Annika’s mother’s MySpace page. The women exchanged photos, arranging to meet last year. Driscoll fantasized about running up to Annika, holding her close and placing her ear over the toddler’s chest to again hear her son’s steady heartbeat and feel his presence. But something unexpected happened when she met the girl. “It was the most amazing thing to see her thriving,” she said, and her initial emotional rush “had nothing to do with Liam.” For a moment, the weight of the past was forgotten as Driscoll marveled at the healthy little person before her.

Darshak Sanghavi, the chief of pediatric cardiology at the University of Massachusetts Medical School, is Slate’s health care columnist and the author of “A Map of the Child: A Pediatrician’s Tour of the Body.”

http://www.nytimes.com/2009/12/20/magazine/20organ-t.html?th&emc=th

A Class Reaches Out and Touches High-Tech Art
By JESSICA REAVES

Like many of us, Mike Nourse is both irritated and entranced by iPhones — their ubiquity, their utility, their unique power to extinguish conversation. Unlike most of us, Mr. Nourse, a co-founder of the Chicago Art Department, is in a position to do something useful with his internal conflict. And so he has, introducing a five-week class called "iPhone Art" at his nonprofit arts education organization.

"I wanted everyone to shut up already about what their iPhone could do and show me what it actually does," said Mr. Nourse, 37, a video artist and photographer who moved to Chicago in 1996.

Despite Mr. Nourse's mixed feelings about Apple's latest gold mine, he said the course was an obvious vehicle for the art department, an all-volunteer organization that describes itself as "dedicated to cultivating new voices, ideas and practices in contemporary art."

"We've always been rooted in accessible art," Mr. Nourse said. "The idea that people could create art with something in their pocket — that seemed like something we needed to tackle."

The iPhone class has eight students. Each of them are responsible for producing a project, in any medium they choose, for a public exhibition titled "iPhone Therefore iArt." It opens Jan. 8 in the organization's Pilsen gallery.

The course costs $50, but in keeping with the spirit of the Chicago Art Department's pedagogical mission, anyone who completes the course and shows their work next month will have their tuition refunded.

In an effort to create a kind of high-tech cross-cultural exchange, Mr. Nourse has also solicited work from a number of relatively well-known iPhone artists, including Susan Murtaugh, a classically trained portraitist who was recently commissioned to "paint" portraits of five members of a corporation's executive board. Ms. Murtaugh, who lives in rural Wisconsin, uses an iPod Touch to create her art because she is outside the range of the iPhone's wireless network.

Mr. Nourse is not the first to teach an iPhone art class, and Ms. Murtaugh is not the first to use a touch-screen to break into mainstream art. The artist Jorge Colombo used his iPhone and its $5 Brushes application to create a New York City streetscape for the June 1 cover of The New Yorker magazine.

While Mr. Colombo's cover demonstrated the medium's commercial potential, it was not enough to convince some artists and intellectuals of its legitimacy. They debated questions of artistic merit and the role of the artist vis-a-vis technology: Is iPhone art "real"? Does technology destroy the connection between the artist and the art?

Many members of the Chicago Art Department say this kind of hand-wringing has accompanied every defining moment in the evolution of art. Just as some painters viewed the emergence of cameras — and the physical separation of artists from their work — with great suspicion, a number of film photographers resisted the proliferation of digital cameras.

Even some of the students who enrolled in the iPhone art class went to the first session with reservations about the technique, or at least the iPhone's legitimacy as an art-making tool. Some have since been converted, but others, like Carl Sweets, are ambivalent.

Mr. Sweets, 34, takes photographs using a 4-by-5, bulky, old-fashioned large-format camera — not very handy for everyday use. He said the iPhone served as a passable, and portable, stand-in.

"I take extremely high-resolution photos, which I can't do with the iPhone," he said. "But I also can't carry the 4-by-5 around with me."

Nathan Peck, a Chicago Art Department co-founder who is taking the iPhone art class, said the phone's shortcomings — tiny lens, small number of pixels — are part of what makes it a compelling artistic tool.

"It has built-in limitations," he said. "But you can choose to use the limitations of the tool as part of the art-making process. That limitation — whether it's using this device, or being asked to make art about a certain city, or shape an idea — it becomes what holds otherwise disparate art together."

The iPhone class met for the last time on Thursday evening, and only a few weeks remain until the exhibition. Mr. Nourse is working on two projects for the show. The first is practical: he is using his iPhone to mix and overlap music, creating the soundtrack for opening night. The second might be described as anthropological: he is snapping photographs of payphones — with his iPhone.

http://www.nytimes.com/2009/12/20/us/20cncart.html?th&emc=th

Parents 'misled' by food labels

Nine out of 10 mothers questioned in a British Heart Foundation (BHF) survey misunderstood the nutrition information on children's foods.

The BHF says mothers believe claims such as "a source of calcium, iron and six vitamins" mean a product is likely to be healthy.

A "mish mash" of different food labelling styles is fuelling confusion among shoppers, it added.

But manufacturers insisted their nutritional labelling was clear.

The survey found that 76% of mothers questioned believed that "wholegrain" means the product is likely to be healthy.

However, the BHF said that - for example - Nestle's Honey Shreddies, which claim to be wholegrain and to "keep your heart healthy and maintain a healthy body", contain more sugar [13.6g] than a ring doughnut [9.2g] in an average serving.

Kellogg's Coco Pops cereal and milk bars are labelled as "a source of calcium, iron and six vitamins" and 63% of mothers in the survey thought they were healthy.

The BHF said that for every 100g they were higher in saturated fat and sugar than the average chocolate cake.

The Natural Confectionery Company Jelly Snakes which are made by Cadbury's contain more calories gram for gram than black treacle, the BHF said.

Single labelling scheme

Almost three in five respondents believed that the phrase "no artificial flavourings, no artificial colourings" indicated a healthy treat.

The questionnaire found that 84% of them wanted a single, front-of-pack food labelling scheme.

Peter Hollins, BHF chief executive, said: "Mums are having the wool pulled over their eyes by food manufacturers.

"Smoke and mirror tactics means that foods targeted at children and high in fat, salt and sugar are being disguised with partial health claims suggesting they are a healthy choice.

"Regularly eating these types of foods could have serious implications for kids' future health."

A single unified labelling system for food is needed because it the "mish mash" of the different systems serves only to confuse shoppers, he added.

"It's time for food companies to stop making excuses, support one system and ensure shoppers are given 'at a glance' information about the foods they're giving their kids."

A spokesman for the Natural Confectionery Company said: "All we claim is that the sweets contain no artificial colours and flavours - which is true - so we're not sure why this should confuse anybody.

"All nutritional information is clearly labelled on the bag."

And a spokesman for Kellogg's responded: "A Kellogg's Coco Pops Cereal and Milk bar actually contains less than two teaspoons of sugar per bar and has half the calories (84) and far less fat than a chocolate bar.

"Parents understand this because we give them the information they need, through our front-of-pack labelling, to make similar comparisons."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8421326.stm

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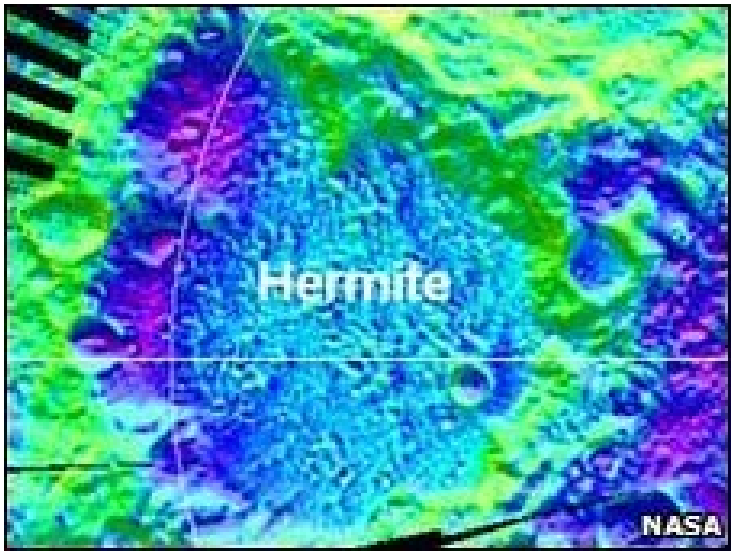
'Coldest place' found on the Moon
By Jonathan Amos
Science correspondent, BBC News, San Francisco

The Moon has the coldest place in the Solar System measured by a spacecraft.



Nasa's Lunar Reconnaissance Orbiter has used its Diviner instrument to probe the insides of permanently shadowed craters on Earth's satellite.

It found mid-winter, night-time surface temperatures inside the coldest craters in the northern polar region can dip as low as minus 247C (26 kelvin).

"The Moon has one of the most extreme thermal environments of any body in the Solar System," said Prof David Paige.

"During the middle of the day, temperatures can get up to about 400K (127C) at the equator; and at the poles at night, they can get very cold," the Diviner principal investigator at the University of California, Los Angeles, added.

Prof Paige has been describing his instrument's latest findings here at the American Geophysical Union's (AGU) Fall Meeting, the world's largest annual gathering of Earth scientists.

Diviner was part of the suite of instruments launched on LRO in June this year and has been operating continuously since it was switched on in July.

In October, the spacecraft found itself in the perfect position to witness summer solstice in the Moon's southern hemisphere and winter solstice in the northern hemisphere.

The Moon does have seasons - just about. The tilt of the lunar axis is 1.54 degrees. For most places, this makes no difference, but as Prof Paige explained, at the poles, this gives rise to a small, three-degree change in the elevation of the Sun on the horizon through the course of a year.

"This results in a significant variation in the extent of shadows and temperatures," he said.

Diviner observed the lowest summer temperatures in the darkest craters at the southern pole to be about 35K (-238C); but in the north, close to the winter solstice the instrument recorded a temperature of just 26K on the south-western edge of the floor of Hermite Crater.

There were also areas on the southern edges of the floors of Peary and Bosch Craters that got almost as cold.

Calculations suggest one would have to travel to a distance beyond the Kuiper Belt - well beyond the orbit of Neptune - to find objects with surfaces this cold.

"The way you can make something cold is to eliminate all possible other heat sources, and in these craters at the lunar poles they receive no direct sunlight and the coldest places don't even receive any indirect sunlight," Prof Paige said.

"In other words, only what little radiation may be scattered from some distant cliff gets down into these areas; and they just cool off. Finally, they reach an equilibrium temperature down at those low values."

The discovery adds further weight to the idea that some craters on the Moon could harbour water-ices for extended periods, and also more volatile substances that require even colder storage temperatures.

LRO'S SCIENCE INSTRUMENTS
- **CRaTER** - characterises the global lunar radiation environment
- **Diviner** - measures lunar surface temperatures
- **LAMP** - maps the Moon's permanently shadowed regions
- **LEND** - measures the flux of neutrons from the Moon
- **LOLA** - provides a global lunar topographic model
- **LROC** - LRO's camera will help select future landing sites
- **Mini-RF** - uses radar to search for evidence of water-ice

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Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8416749.stm

Published: 2009/12/16 19:14:03 GMT

Experts crack cancer 'gene code'
By Michelle Roberts
Health reporter, BBC News

Scientists have unlocked the entire genetic code of two of the most common cancers - skin and lung - a move they say could revolutionise cancer care.

Not only will the cancer maps pave the way for blood tests to spot tumours far earlier, they will also yield new drug targets, says the Wellcome Trust team.

Scientists around the globe are now working to catalogue all the genes that go wrong in many types of human cancer.

The UK is looking at breast cancer, Japan at liver and India at mouth.

China is studying stomach cancer, and the US is looking at cancers of the brain, ovary and pancreas.

" **These catalogues are going to change the way we think about individual cancers** "
Wellcome Trust scientist Professor Michael Stratton

The International Cancer Genome Consortium scientists from the 10 countries involved say it will take them at least five years and many hundreds of thousands of dollars to complete this mammoth task.

But once they have done this, patients will reap the benefits.

Professor Michael Stratton, who is the UK lead, said: "These catalogues are going to change the way we think about individual cancers.

"By identifying all the cancer genes we will be able to develop new drugs that target the specific mutated genes and work out which patients will benefit from these novel treatments.

"We can envisage a time when following the removal of a cancer cataloguing it will become routine."

It could even be possible to develop MoT-style blood tests for healthy adults that can check for tell-tale DNA patterns suggestive of cancer.

Russian roulette

The scientists found the DNA code for a skin cancer called melanoma contained more than 30,000 errors almost entirely caused by too much sun exposure.

" **Most of the time the mutations will land in innocent parts of the genome, but some will hit the right targets for cancer** "
Wellcome Trust researcher Dr Peter Campbell

The lung cancer DNA code had more than 23,000 errors largely triggered by cigarette smoke exposure.

From this, the experts estimate a typical smoker acquires one new mutation for every 15 cigarettes they smoke.

Although many of these mutations will be harmless, some will trigger cancer.

Wellcome Trust researcher Dr Peter Campbell, who conducted this research, published in the journal Nature, said: "It's like playing Russian roulette.

"Most of the time the mutations will land in innocent parts of the genome, but some will hit the right targets for cancer."

By quitting smoking, people could reduce their cancer risk back down to "normal" with time, he said.

The suspicion is lung cells containing mutations are eventually replaced with new ones free of genetic errors.

By studying the cancer catalogues in detail, the scientists say it should be possible to find exactly which lifestyle and environmental factors trigger different tumours.

Treatment and prevention

Tom Haswell, who was successfully treated 15 years ago for lung cancer, believes the research will benefit the next generation:

"For future patients I think it's tremendous news because hopefully treatments can be targeted to their particular genome mutations, hopefully... reducing some of the side effects we get".

Cancer experts have applauded the work.

The Institute of Cancer Research said: "This is the first time that a complete cancer genome has been sequenced and similar insights into other cancer genomes are likely to follow.

"As more cancer genomes are revealed by this technique, we will gain a greater understanding of how cancer is caused and develops, improving our ability to prevent, treat and cure cancer."

Professor Carlos Caldas, from Cancer Research UK's Cambridge Research Institute called the research "groundbreaking".

"Like molecular archaeologists, these researchers have dug through layers of genetic information to uncover the history of these patients' disease.

"What is so new in this study is the researchers have been able to link particular mutations to their cause.

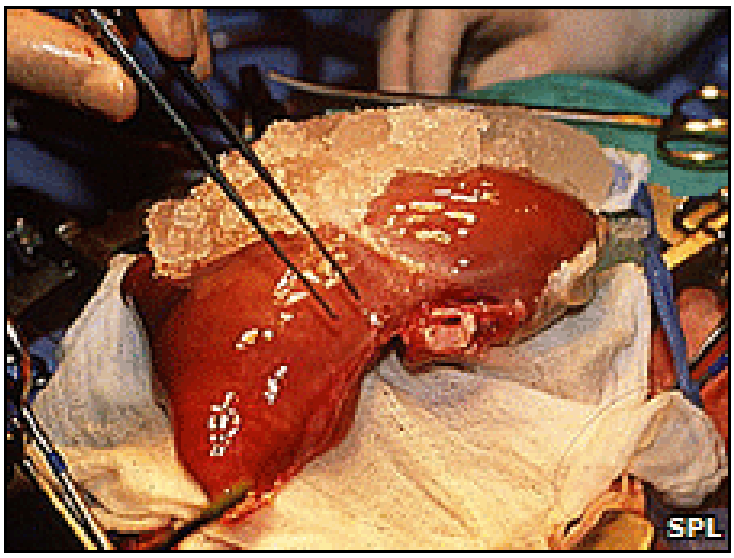
"The hope and excitement for the future is that we will eventually have detailed picture of how different cancers develop, and ultimately how better to treat and prevent them."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8414124.stm

Published: 2009/12/16 18:00:06 GMT

Donors in Israel get op priority
By Adam Brimelow
BBC News health correspondent

Israel is to become the first country to give donor card carriers a legal right to priority treatment if they should require an organ transplant.



The law has been changed to try to boost donation rates, as there is a shortage for organs for donation.

Partners and close relatives of those with signed donor cards will also move up the queue, The Lancet medical journal reports.

Critics say patients should be treated on the basis of clinical need.

Writing in The Lancet, Professor Jacob Lavee, of the Sheba Medical Centre, one of the leading advocates for the reform, describes Israel's organ donation statistics as "grim".

" **We would have serious concerns about a system that would move away from treating patients on the basis of clinical need** "
Dr Vivienne Nathanson British Medical Association

Only one in 10 adults in Israel carries a donor card. In the UK about one in four adults is on the organ donor register.

In 2006, the Israel National Transplant Council established a special committee, including ethicists, philosophers, religious representatives and transplant surgeons to review the problem.

Their proposal to bring in non-medical criteria for organ allocation required legislation by the Israeli parliament.

Under the planned point-based system, people who have signed a donor card will be given priority for a transplant.

Their partners and other close relatives will also qualify.

However, there will be no preference for live donors who give to a chosen recipient rather than the wider waiting list.

Urgent cases

Patients requiring an urgent transplant because of their serious condition will continue to have priority, regardless of the new points-scheme.

But if there are two people in this situation who are equally suitable for a donated organ, the priority system will come into play.

Professor Lavee said the new policy "provides an incentive for individuals to agree to help each other".

“ **It is important that donated organs are available for those who need them most** ”
Mubeen Bhutta British Heart Foundation

But he acknowledged that it violated the principle of "true altruism", and the "ideal" of care being provided solely according to medical need.

However, he concluded that this was a price worth paying.

He said: "If this policy results in the procurement of more organs for transplantation, then it promotes a different but nonetheless important goal of medicine - achievement of maximum health."

Misgivings

Dr Vivienne Nathanson, head of science and ethics at the British Medical Association, voiced strong misgivings.

"We would have serious concerns about a system that would move away from treating patients on the basis of clinical need," she said.

"Once you start prioritising certain groups, for example those that sign up to the organ register, patients who are really sick and in danger of dying if they don't receive an organ may end up being pushed to the back of the queue".

And Mubeen Bhutta, Policy Manager at the British Heart Foundation, said: "This interesting new law in Israel highlights the challenges facing countries around the world seeking to increase the availability of donated organs.

"However, it is important that donated organs are available for those who need them most.

Presumed consent

The BMA and BHF both support the introduction of presumed consent, where instead of opting into donation by signing a register - as happens in the UK - people would be required to state if they did not want their organs to be used for transplantation.

This approach also has the strong backing of the Chief Medical Officer for England, Professor Sir Liam Donaldson, who announced this week that he would step down from the post next May.

"I would love to see presumed consent on organs," he said.

"This prissiness about the idea of giving organs to somebody after you have died - I think it's something that's not supported by the public."

The Department of Health in England says the UK's organ donation system has to ensure that patients are treated equally and fairly, based on their need and the importance of achieving the closest possible match.

A spokesman said: "More people are signing up to the organ donor register than ever before but, despite this, three people die every day while waiting for a transplant and more donors are needed.

"We aim to see donor rates increase from 800 donors to 1,400 donors per year by March 2013, and 20 million people on the organ donor register by 2010, working towards 25 million by 2013."

Preparations for the new policy in Israel will start in the new year with a publicity campaign.

The new arrangements will come into force in January 2011, with priority going to all those who have had a signed donor card for at least a year.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8416443.stm

Published: 2009/12/17 00:03:44 GMT

Global Warming Likely to Be Amplified by Slow Changes to Earth Systems, Geologists Say

Power plant. The kinds of increases in atmospheric carbon dioxide taking place today could have a significantly larger effect on global temperatures than previously thought. (Credit: iStockphoto/Zsolt Bicz)

ScienceDaily (Dec. 21, 2009) — The kinds of increases in atmospheric carbon dioxide taking place today could have a significantly larger effect on global temperatures than previously thought, according to a new study led by Yale University geologists.

Their findings appear December 20 in the advanced online edition of *Nature Geoscience.*

The team demonstrated that only a relatively small rise in atmospheric carbon dioxide (CO_2) was associated with a period of substantial warming in the mid- and early-Pliocene era, between three to five million years ago, when temperatures were approximately 3 to 4 degrees Celsius warmer than they are today.

Climate sensitivity -- the mean global temperature response to a doubling of the concentration of atmospheric CO_2 -- is estimated to be 1.5 to 4.5 degrees Celsius, using current models.

"These models take into account only relatively fast feedbacks, such as changes in atmospheric water vapor and the distribution of sea ice, clouds and aerosols," said Mark Pagani, associate professor of geology and geophysics at Yale and lead author of the paper. "We wanted to look at Earth-system climate sensitivity, which includes the effects of long-term feedbacks such as change in continental ice-sheets, terrestrial ecosystems and greenhouse gases other than CO_2."

To do this, the team focused on the most recent episode of sustained global warmth with geography similar to today's. Their reconstructed CO_2 concentrations for the past five million years was used to estimate Earth-system climate sensitivity for a fully equilibrated state of the planet, and found that a relatively small rise in CO_2 levels was associated with substantial global warming 4.5 million years ago. They also found that the global temperature was 2 to 3 degrees Celsius higher than today while CO_2 levels were only between about 365 and 415 parts per million (ppm) -- similar to today's concentration of about 386 ppm.

"This work and other ancient climate reconstructions reveal that Earth's climate is more sensitive to atmospheric carbon dioxide than is discussed in policy circles," Pagani said. "Since there is no indication that the future will behave differently than the past, we should expect a couple of degrees of continued warming even if we held CO_2 concentrations at the current level."

Other authors of the paper include Zhonghui Liu (Yale University and The University of Hong Kong), and Jonathan LaRiviere and Ana Christina Ravelo (University of California, Santa Cruz).

This study used samples provided by the Integrated Ocean Drilling Program and was funded by the National Science Foundation and the Yale Climate and Energy Institute.

Story Source:

Adapted from materials provided by Yale University.

Journal Reference:

1. Pagani et al. . *Nature Geoscience*, December 20, 2009 DOI: 10.1038/NGE0724

http://www.sciencedaily.com/releases/2009/12/091220143921.htm

Septic Shock: Nitric Oxide Beneficial After All

ScienceDaily (Dec. 21, 2009) — Scientists at VIB and Ghent University in Flanders, Belgium have found an unexpected ally for the treatment of septic shock, the major cause of death in intensive care units. By inducing the release of nitric oxide (NO) gas in mice with septic shock, researchers Anje Cauwels and Peter Brouckaert discovered that the animal's organs showed much less damage, while their chances of survival increased significantly. That's contrary to all expectations, since it is generally assumed that nitric oxide is responsible for the potentially lethal drop in blood pressure in septic shock.

Septic shock, or sepsis, is a medical condition in which acute inflammation, low blood pressure, and blood clotting cause a dangerous decrease in the delivery of blood to the organs. Because of the lack of oxygen, the patient's organs start to fail, one after the other. Currently, only supportive treatment is available.

It is generally assumed that nitric oxide (NO) gas is responsible for the hypotension and cardiovascular collapse in septic shock. Therefore, a lot of medical research is focused on combating NO, which is also a messenger molecule in the body. Attempts to inhibit its production paradoxically led to a worsening of the organ damage and in an increased lethality, both in animal models and in a clinical trial in sepsis patients. This led to the assumption that NO also has positive effects in sepsis, but up to now NO remained a prime suspect for the pathogenesis of the cardiovascular shock.

The team in Ghent is turning this paradigm upside-down in an article that will appear in The *Journal of Experimental Medicine* on Monday 21 December 2009. During their research, Cauwels and Brouckaert administered nitrite − a substance that releases NO − to mice with septic shock. The nitrite treatment, in sharp contrast with the worsening effect of inhibiting NO-synthesis, significantly attenuates hypothermia, mitochondrial damage, oxidative stress and dysfunction, tissue infarction, and mortality in mice. It is not yet known what mechanisms are at work behind this observation. That will be the subject of further research.

For now, not only is this discovery revolutionizing the way in which scientists view nitric oxide's role in septic shock − it also opens possibilities for treatment. Instead of trying to prevent the effects of NO, they should rather be imitated or reinforced to provide a solution for saving organs or particular parts of the body where there is a lack of oxygen due to septic shock.

Story Source:

Adapted from materials provided by VIB (the Flanders Institute for Biotechnology), via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/12/091215101703.htm

Scientists Take a Step Towards Uncovering the Histone Code

ScienceDaily (Dec. 21, 2009) — Researchers at Emory University School of Medicine have determined the structures of two enzymes that customize histones, the spool-like proteins around which DNA coils inside the cell.

The structures provide insight into how DNA's packaging is just as important and intricate as the information in the DNA itself, and how these enzymes are part of a system of inspectors making sure the packaging is in order.

The results are published online this week in the journal *Nature Structural and Molecular Biology*.

A team of scientists led by Xiaodong Cheng, PhD, professor of biochemistry at Emory and a Georgia Research Alliance eminent scholar, used X-rays to probe the architecture of two enzymes, PHF8 and KIAA1718. The enzymes are known as histone demethylases because they remove methyl groups (chemical modifications of a protein) from histones.

Mutations in the gene encoding one of the enzymes, PHF8, cause a type of inherited mental retardation. Understanding how PHF8 works may help doctors better understand or even prevent mental retardation.

Many biologists believe the modifications on histones are a code, analogous to the genetic code. Depending on the histones' structure, access to DNA in the nucleus can be restricted or relatively free. The idea is: the modifications tell enzymes that act on DNA valuable information about getting to the DNA itself.

"This work represents a step toward uncovering the molecular basis for how demethylases handle multiple signals on histones," says Paula Flicker, PhD, who oversees cell signaling grants at the National Institutes of Health's National Institute of General Medical Sciences. "Knowledge of how these complex signals help govern patterns of gene activity will bring us closer to understanding how cells determine their identity during development."

To understand histone demethylases' role in the cell, Cheng says, think of the cell as a library with thousands of books in it.

"To find a particular book in a library, you need some signs telling you how the stacks are organized," he says. "Similarly, the machinery that reads DNA needs some guidance to get to the right place."

Histones have a core that the DNA wraps around and flexible tails extending beyond the core. The cells' enzymes attach a variety of bells and whistles -- methyl groups are just one -- to the histone tails to remind the cell how to handle the associated DNA.

Methyl groups mean different things depending on where they are on the histone. In addition, the modifications vary from cell to cell. In the brain, for example, the modifications on a particular gene might signal "this gene should be read frequently," and in muscle, a different set of modifications will say "keep quiet."

"What these enzymes do is make sure all the signs are consistent with each other," Cheng says. "If a sign is out of place, they remove it."

PHF8 and KIAA1718 are each made up of two attached modules. One module (called PHD) grabs a histone tail with a methyl group on it, while the other module (Jumonji) removes a methyl group from somewhere else on the tail.

Scientists previously knew the structures of the methyl-binding and methyl-removing modules in isolation. What is new is seeing how the modules are connected and how one part regulates the other, Cheng says.

The research was supported by the National Institutes of Health and the Georgia Research Alliance.

Story Source:

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

Journal Reference:

1. J.R. Horton, A.K. Upadhyay, H.H. Qi, X. Zhang, Y. Shi and X. Cheng. **Enzymatic and Structural Insights for Substrate Specificity of a family of Jumonji Histone Lysine Demethylases**. *Nature Struct. Mol.*, Bio. 17 (2009)

http://www.sciencedaily.com/releases/2009/12/091220143925.htm

Programmed Cell Death: Pores Finding Reveals Targets for Cancer and Degenerative Disease

Dr Ruth Kluck has been investigating the role in apoptosis of two proteins, Bak and Bax. (Credit: Image courtesy of Walter and Eliza Hall Institute)

ScienceDaily (Dec. 21, 2009) — Walter and Eliza Hall Institute scientists have identified a key step in the biological process of programmed cell death, also called apoptosis.

Apoptosis is important in human biology as it removes unwanted and sometimes dangerous cells from our bodies, protecting us against cancer development. It can also, however, lead to the development of degenerative diseases when healthy cells are errantly destroyed.

The research, led by Dr Ruth Kluck from the institute's Molecular Genetics of Cancer Division, is crucial to the development of drugs that can turn on apoptosis, thereby more effectively killing cancer cells. It could also be used in developing compounds that turn off the apoptosis that leads to degenerative disorders.

Dr Kluck has been investigating the role in apoptosis of two proteins, Bak and Bax. It is thought that understanding their role will identify targets against which drugs to regulate cell death could be designed.

"The pivotal step towards cell death is the formation of a pore in the mitochondria; mitochondria make and supply energy to the cells," Dr Kluck said. "Pore formation is the point of no return in apoptotic cell death as it allows cytochrome c, which is the protein that initiates cell death, to escape from the mitochondria. Only two proteins are known to form the pore, Bak and Bax."

In 2008 Dr Kluck and her colleagues published their finding that, in order to form the pore, Bak first changes shape and then combines with another Bak protein to form a doublet.

"We have now identified the second step in how Bak forms that pore," Dr Kluck said. "Once the doublet is formed it can combine with other Bak doublets by what's called a second interface. This second interface seems to allow doublets to assemble into the larger complexes that form the pore."

The team of Dr Kluck, Dr Grant Dewson, Mr Tobias Kratina, Dr Peter Czabotar and Professor Jerry Adams from the institute and Dr Catherine Day from the University of Otago published their finding in the 25 November issue of *Molecular Cell*.

Dr Kluck said the team would continue to study how the large complexes of Bak and Bax force a hole in the mitochondrial membrane, how to start this process more effectively in cancer cells, and how to prevent it in brain and other healthy cells.

"A major black box in understanding apoptosis is how Bak and Bax work. Because these proteins change shape and lodge in a membrane they are hard to study. Any understanding we gain about how Bak and Bax form a pore, how they change shape and how they bind to each other, will help us understand how cancer cells can be targeted to die."

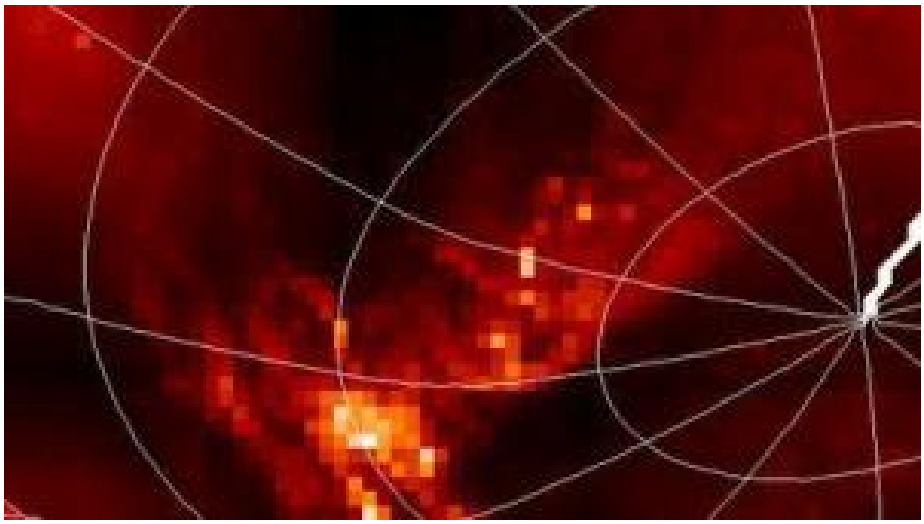
The research was funded by the Cancer Council Victoria, the National Health and Medical Research Council and the Australian Research Council.

Story Source:

Adapted from materials provided by Walter and Eliza Hall Institute.

http://www.sciencedaily.com/releases/2009/12/091218094700.htm

Fog Discovered on Saturn's Largest Moon, Titan



Fingers of fog can be seen moving across the south pole of Titan in this image constructed by Mike Brown and his colleagues using data from the Cassini spacecraft. The fog shows regions where pools of liquid methane sitting on the surface of Titan are evaporating into the atmosphere. After a long summer of frequent clouds and rain at the south pole, it appears in this late summer image that evaporating liquid methane covers large areas of the pole. (Credit: Mike Brown/Caltech)

ScienceDaily (Dec. 20, 2009) — Saturn's largest moon, Titan, looks to be the only place in the solar system -- aside from our home planet, Earth -- with copious quantities of liquid (largely, liquid methane and ethane) sitting on its surface. According to planetary astronomer Mike Brown of the California Institute of Technology (Caltech), Earth and Titan share yet another feature, which is inextricably linked with that surface liquid: common fog.

The presence of fog provides the first direct evidence for the exchange of material between the surface and the atmosphere, and thus of an active hydrological cycle, which previously had only been known to exist on Earth.In a talk to be delivered December 18 at the American Geophysical Union's 2009 Fall Meeting in San Francisco, Brown, the Richard and Barbara Rosenberg Professor and professor of planetary astronomy, details evidence that Titan's south pole is spotted "more or less everywhere" with puddles of methane that give rise to sporadic layers of fog. (Technically, fog is just a cloud or bank of clouds that touch the ground).

Brown and his colleagues also describe their findings in a recent paper published in The *Astrophysical Journal Letters*.The researchers made their discovery using data from the Visual and Infrared Mapping Spectrometer (VIMS) onboard the Cassini spacecraft, which has been observing Saturn's system for the past five years.

The VIMS instrument provides "hyperspectral" imaging, covering a large swath of the visible and infrared spectrum. Brown and his colleagues -- including Caltech undergraduate students Alex Smith and Clare Chen, who were working with Brown as part of a Summer Undergraduate Research Fellowship (SURF) project -- searched public online archives to find all Cassini data collected over the moon's south pole from October 2006 through March 2007. They filtered the data to separate out features occurring at different depths in the atmosphere, ranging from 20 kilometers (12.4 miles) to .25 kilometers (820 feet) above the surface. Using other filters, they homed in on "bright" features caused by the scattering of light off small particles -- such as the methane droplets present in clouds.

In this way, they isolated clouds located about 750 meters (less than a half-mile) above the ground. These clouds did not extend into the higher altitudes -- into the moon's troposphere, where regular clouds form.

In other words, says Brown, they had found fog."Fog -- or clouds, or dew, or condensation in general -- can form whenever air reaches about 100 percent humidity," Brown says. "There are two ways to get there. The first is obvious: add water (on Earth) or methane (on Titan) to the surrounding air. The second is much more common: make the air colder so it can hold less water (or liquid methane), and all of that excess needs to condense."

This, he explains, is the same process that causes water droplets to form on the outside of a cool glass.

On Earth, this is the most common method of making fog, Brown says. "That fog you often see at sunrise hugging the ground is caused by ground-level air cooling overnight, to the point where it cannot hang onto its water. As the sun rises and the air heats, the fog goes away."

Similarly, fog can form when wet air passes over cold ground; as the air cools, the water condenses. And mountain fog occurs when air gets pushed up the side of a mountain and cools, causing the water to condense.

However, none of these mechanisms work on Titan.The reason is that Titan's muggy atmosphere takes a notoriously long time to cool (or warm). "If you were to turn the sun totally off, Titan's atmosphere would still take something like 100 years to cool down," Brown says. "Even the coldest parts of the surface are much too warm to ever cause fog to condense."Mountain fog is also out of the question, he adds. "A Titanian mountain would have to be about 15,000 feet high before the air would get cold enough to condense," he says. And yet the tallest mountains the moon could possibly carry (because of its fragile, icy crust) would be no more than 3000 feet high.

The only possible way to make Titanian fog, then, is to add humidity to the air. And the only way to do that, Brown says, is by evaporating liquid -- in this case, methane, the most common hydrocarbon on the moon, which exists in solid, liquid, and gaseous forms.

Brown notes that evaporating methane on Titan "means it must have rained, and rain means streams and pools and erosion and geology. The presence of fog on Titan proves, for the first time, that the moon has a currently active methane hydrological cycle."The presence of fog also proves that the moon must be dotted with methane pools, Brown says. That's because any ground-level air, after becoming 100 percent humid and turning into fog, would instantly rise up into the atmosphere like a giant cumulus cloud. "The only way to make the fog stick around on the ground is to both add humidity and cool the air just a little," he explains. "The way to cool the air just a little is to have it in contact with something cold, like a pool of evaporating liquid methane."

In addition to Smith and Chen, The *Astrophysical Journal Letters* paper was coauthored by Máté Ádámkovics from the University of California, Berkeley. The work was funded by a grant from the National Science Foundation's Planetary Astronomy program.

Story Source:

Adapted from materials provided by California Institute of Technology, via EurekAlert!, a service of AAAS.

Journal References:

1. Brown et al. **Discovery of Fog at the South Pole of Titan**. *The Astrophysical Journal*, 2009; 706 (1): L110 DOI: 10.1088/0004-637X/706/1/L110

http://www.sciencedaily.com/releases/2009/12/091218094637.htm

Cannabis Damages Young Brains More Than Originally Thought, Study Finds

Daily consumption of cannabis in teens can cause depression and anxiety, and have an irreversible long-term effect on the brain. (Credit: iStockphoto/Rasmus Rasmussen)

ScienceDaily (Dec. 20, 2009) — Canadian teenagers are among the largest consumers of cannabis worldwide. The damaging effects of this illicit drug on young brains are worse than originally thought, according to new research by Dr. Gabriella Gobbi, a psychiatric researcher from the Research Institute of the McGill University Health Centre. The new study, published in *Neurobiology of Disease*, suggests that daily consumption of cannabis in teens can cause depression and anxiety, and have an irreversible long-term effect on the brain.

"We wanted to know what happens in the brains of teenagers when they use cannabis and whether they are more susceptible to its neurological effects than adults," explained Dr. Gobbi, who is also a professor at McGill University. Her study points to an apparent action of cannabis on two important compounds in the brain -- serotonin and norepinephrine -- which are involved in the regulation of neurological functions such as mood control and anxiety.

"Teenagers who are exposed to cannabis have decreased serotonin transmission, which leads to mood disorders, as well as increased norepinephrine transmission, which leads to greater long-term susceptibility to stress," Dr. Gobbi stated.

Previous epidemiological studies have shown how cannabis consumption can affect behaviour in some teenagers. "Our study is one of the first to focus on the neurobiological mechanisms at the root of this influence of cannabis on depression and anxiety in adolescents," confirmed Dr. Gobbi. It is also the first study to demonstrate that cannabis consumption causes more serious damage during adolescence than adulthood.

Dr. Gabriella Gobbi is a researcher at the neuroscience axis of the Research Institute of the McGill University Health Centre and also a psychiatrist and associate professor at the Department of Psychiatry, McGill University.

This study was funded by a grant from The Canadian Psychiatric Research Foundation (CPRF)

This article was co-authored by Dr. Francis Rodriguez Bambico; Ms. Nhu-Tram Nguyen, and Mr. Noam Katz from from IR-MUHC and the Neurobiological Psychiatry Unit, Department of Psychiatry, McGill University.

Story Source:

Adapted from materials provided by McGill University Health Centre, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/12/091217115834.htm

Warming Climate Chills Sonoran Desert's Spring Flowers

Ecologists Sarah Kimball (left) and Amy Angert (on the right behind a creosote bush) count seedlings of winter annual plants at a study site located at Tumamoc Hill, home of the University of Arizona's Desert Laboratory. (Credit: Copyright 2007 Jonathan L. Horst.)

ScienceDaily (Dec. 20, 2009) — Global warming is giving a boost to Sonoran Desert plants that have an edge during cold weather, according to new research.

Although the overall numbers of winter annuals have declined since 1982, species that germinate and grow better at low temperatures are becoming more common.

"It's an unexpected result -- that global warming has led to an increase in cold-adapted species," said lead author Sarah Kimball, a research associate at the University of Arizona in Tucson. "Because the winter rains are arriving later, they are occurring under colder temperatures."

Climate change is shifting the winter storm track so the Sonoran Desert's winter rains now generally begin in late November or early December, rather than during the balmy days of late October.

Therefore seeds that require winter rains must sprout during the cooler days of December.

"Southern Arizona has been getting hotter and drier for the last 25 or 30 years, and as a result, the desert annuals we've been studying at Tumamoc Hill have been changing," said co-author D. Lawrence Venable, the UA's director of research at Tumamoc Hill.

The researchers focused on the nine most abundant species, which comprise 74 percent of all winter annuals found at the study area.

The species of winter desert annuals studied are ones Venable calls "the bread and butter flowers that you see everywhere." Some are called "belly flowers" because they are best seen close up, in contrast to the less common, showy desert annuals like poppies and lupines.

The findings are part of a long-term study of winter annuals that Venable, a UA professor of ecology and evolutionary biology, initiated at Tumamoc Hill in 1982.

Kimball, Venable and their colleagues are publishing their paper in an upcoming issue of the journal *Global Change Biology*. Amy Angert, now at Colorado State University in Fort Collins, Colo., and Travis Huxman of the UA are also co-authors. The National Science Foundation and the Philecology Foundation of Fort Worth, Texas funded the research.

In 1982, Venable began intensive research into the growth of desert annuals in relation to climate by setting up permanent study plots at Tumamoc Hill.

His research team has been continually monitoring the germination, survival and seed production of the winter annuals ever since. The weather station on Tumamoc Hill provides records of local temperatures and precipitation.

Venable now has 72 plots and a team of people to study each plant's life. Team members start collecting the data 10 days after the first winter rain and after every subsequent rain. Even when there are no subsequent rain events, the team still collects the data monthly.

For each plot, a clear sheet of stiff plastic serves as the year's record of the plants' location and life history.On each visit, a researcher places the plastic sheet on a frame 3 inches above the plot and uses a permanent marker to record the location of each germinating plant on the plastic sheet. As the season progresses, each plant's survival and seed production is marked on the same sheet.

To make sure even the littlest plant is not overlooked, the researchers must hunch over the plot and its plastic sheet."We use knee pads,for sure," Kimball said.

In 2007, Kimball reviewed the data and realized that the temperature at which germination occurred had declined steadily since 1982. However, some species had not done as badly as others and she wondered why.

So she turned to Venable's long-term data set to see which aspect of the plants' growth was responsible for the change. She wanted to know whether some species were germinating better or grew better or just made more seeds.In a previous study, Venable and his colleagues had examined the physiology of the nine species and found that some grow better under cold conditions and are more efficient at using water. Those species are now becoming more common as the changing climate shifts the onset of the winter rains.

"The physiological component was the 'Ah Ha!' thing," Venable said. "The more water-use-efficient species are more adapted for growing under cold conditions."Some cold-adapted winter annuals that are becoming more common are popcorn flower, or Pectocarya recurvata, and Erodium cicutarium, known more commonly as red filaree or storksbill.

In contrast, species that germinate better when it is warm, such as wooly sunflower, known to scientists as Eriophyllum lanosum, and a species of plantain, Plantago insularis, are becoming less common.

"Even though overall the winter growing season is getting warmer, what's important in this system is that the growing season is initiated at a later date under colder temperatures," Kimball said. "This demonstrates that the response of organisms to climate change can be unexpected."

Story Source:

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

Journal Reference:

1. Kimball et al. **Contemporary climate change in the Sonoran Desert favors cold-adapted species**. *Global Change Biology*, 2009; DOI: 10.1111/j.1365-2486.2009.02106.x

http://www.sciencedaily.com/releases/2009/12/091216144145.htm

Fear of Lawsuits May Prompt Some Doctors to Overprescribe Antibiotics

ScienceDaily (Dec. 20, 2009) — A new study led by a team of researchers at New York Medical College suggests that that medical liability concerns may be playing a role in the increase of MRSA in healthcare settings by encouraging clinicians to prescribe antibiotics more often and more broadly than clinical circumstances and evidence-based guidelines warrant.

The study appeared in the September-October issue of the *American Journal of Therapeutics*.The team analyzed census figures, statistics on population density of attorneys and physicians, and data on antibiotic utilization for the United States, Canada, and 15 European countries. They compared this to statistics on the percentage of methicillin resistance among clinical isolates of S. aureus. They found a strong correlation between the prevalence of methicillin resistance and density of attorneys in countries in Europe and North America. They found no correlation between prevalence of methicillin resistance and physician density.

Investigators surveyed 162 healthcare providers to determine whether medical liability concerns were as important as antibiotic cost and formulary restrictions in selecting treatment regimens. The surveys also confirmed that physicians were more concerned about medical liability in cases of under-prescribing antibiotics rather than by over-prescribing them.George Sakoulas, M.D., assistant professor of medicine and lead author of the study, concluded, "The findings suggest that more research is needed to evaluate the potential impact of medical liability concerns on the medical care system. The study findings hint toward the importance of medical tort reform as a way to reduce healthcare costs and improve quality. Another way might be to foster more judicious prescription of antibiotics based on science and evidence rather than on risk aversion."

Story Source:

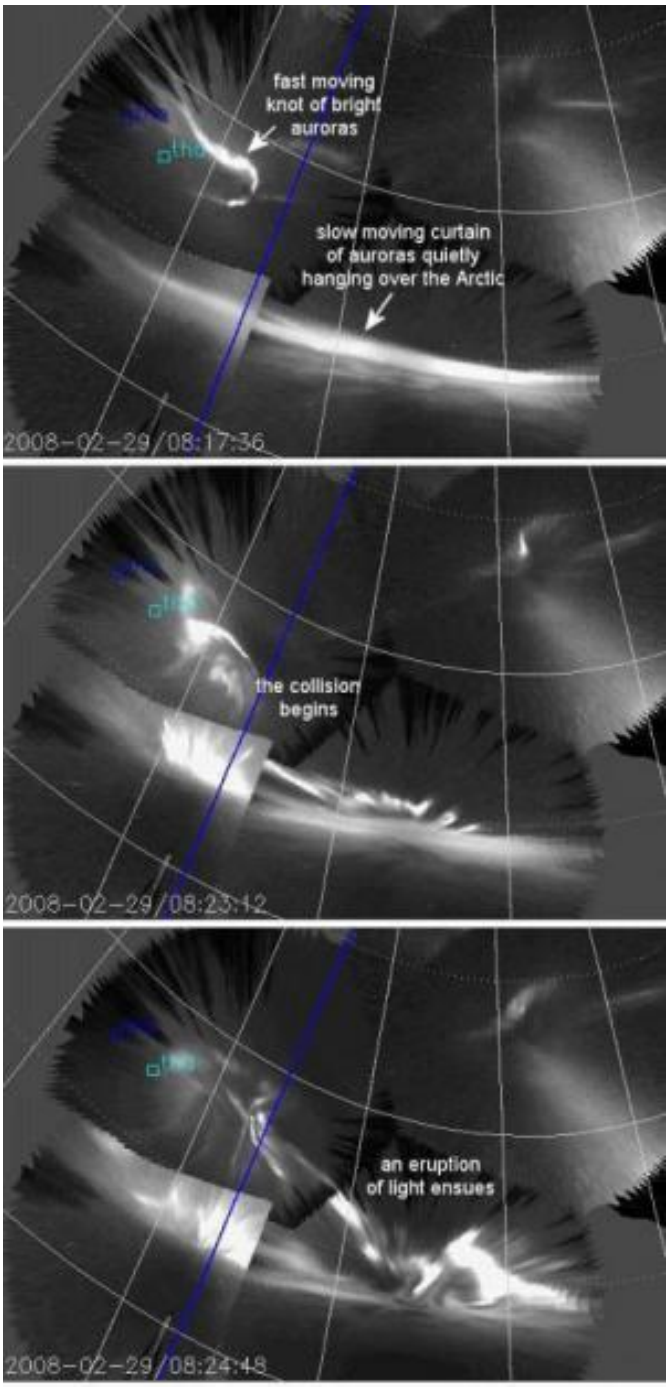
Adapted from materials provided by New York Medical College, via EurekAlert!, a service of AAAS.

Journal Reference:

1. Sakoulas, George; Wormser, Gary P; Visintainer, Paul; Aronow, Wilbert S; Nadelman, Robert B. **Relationship Between Population Density of Attorneys and Prevalence of Methicillin-Resistant Staphylococcus aureus: Is Medical-Legal Pressure on Physicians a Driving Force Behind the Development of Antibiotic Resistance?** *American Journal of Therapeutics*, 2009; 16 (5): e1 DOI: 10.1097/MJT.0b013e3181727946

http://www.sciencedaily.com/releases/2009/12/091218163643.htm

Colliding Auroras Produce an Explosion of Light



This three frame animation of THEMIS/ASI images shows auroras colliding on Feb. 29, 2008. (Credit: Toshi Nishimura/UCLA)

ScienceDaily (Dec. 20, 2009) — A network of cameras deployed around the Arctic in support of NASA's THEMIS mission has made a startling discovery about the Northern Lights. Sometimes, vast curtains of aurora borealis collide, producing spectacular outbursts of light. Movies of the phenomenon were unveiled on December 17 at the Fall Meeting of the American Geophysical Union in San Francisco.

"Our jaws dropped when we saw the movies for the first time," said space scientist Larry Lyons of the University of California-Los Angeles (UCLA), a member of the team that made the discovery. "These outbursts are telling us something very fundamental about the nature of auroras."

The collisions occur on such a vast scale that isolated observers on Earth -- with limited fields of view -- had never noticed them before. It took a network of sensitive cameras spread across thousands of miles to get the big picture.

NASA and the Canadian Space Agency created such a network for THEMIS, short for "Time History of Events and Macroscale Interactions during Substorms." THEMIS consists of five identical probes launched in 2006 to solve a long-standing mystery: Why do auroras occasionally erupt in an explosion of light called a substorm?

Twenty all-sky imagers (ASIs) were deployed across the Alaskan and Canadian Arctic to photograph auroras from below while the spacecraft sampled charged particles and electromagnetic fields from above. Together, the on-ground cameras and spacecraft would see the action from both sides and be able to piece together cause and effect -- or so researchers hoped. It seems to have worked.

The breakthrough came earlier this year when UCLA researcher Toshi Nishimura assembled continent-wide movies from the individual ASI cameras. "It can be a little tricky," Nishimura said. "Each camera has its own local weather and lighting conditions, and the auroras are different distances from each

camera. I've got to account for these factors for six or more cameras simultaneously to make a coherent, large-scale movie."

The first movie he showed Lyons was a pair of auroras crashing together in Dec. 2007. "It was like nothing I had seen before," Lyons recalled. "Over the next several days, we surveyed more events. Our excitement mounted as we became convinced that the collisions were happening over and over."

The explosions of light, they believe, are a sign of something dramatic happening in the space around Earth -- specifically, in Earth's "plasma tail." Millions of kilometers long and pointed away from the sun, the plasma tail is made of charged particles captured mainly from the solar wind. Sometimes called the "plasma sheet," the tail is held together by Earth's magnetic field.

The same magnetic field that holds the tail together also connects it to Earth's polar regions. Because of this connection, watching the dance of Northern Lights can reveal much about what's happening in the plasma tail.

THEMIS project scientist Dave Sibeck of NASA's Goddard Space Flight Center, Greenbelt, Md. said, "By putting together data from ground-based cameras, ground-based radar, and the THEMIS spacecraft, we now have a nearly complete picture of what causes explosive auroral substorms,"

Lyons and Nishimura have identified a common sequence of events. It begins with a broad curtain of slow-moving auroras and a smaller knot of fast-moving auroras, initially far apart. The slow curtain quietly hangs in place, almost immobile, when the speedy knot rushes in from the north. The auroras collide and an eruption of light ensues.

How does this sequence connect to events in the plasma tail? Lyons believes the fast-moving knot is associated with a stream of relatively lightweight plasma jetting through the tail. The stream gets started in the outer regions of the plasma tail and moves rapidly inward toward Earth. The fast knot of auroras moves in synch with this stream.

Meanwhile, the broad curtain of auroras is connected to the stationary inner boundary of the plasma tail and fueled by plasma instabilities there. When the lightweight stream reaches the inner boundary of the plasma tail, there is an eruption of plasma waves and instabilities. This collision of plasma is mirrored by a collision of auroras over the poles.

National Science Foundation-funded radars located in Poker Flat, Alaska, and Sondrestrom, Greenland, confirm this basic picture. They have detected echoes material rushing through Earth's upper atmosphere just before the auroras collide and erupt. The five THEMIS spacecraft also agree. They have been able to fly through the plasma tail and confirm the existence of lightweight flows rushing toward Earth.

Story Source:

Adapted from materials provided by NASA/Goddard Space Flight Center.

http://www.sciencedaily.com/releases/2009/12/091217141318.htm

Hubble's Festive View of a Grand Star-Forming Region

The massive, young stellar grouping, called R136, is only a few million years old and resides in the 30 Doradus Nebula, a turbulent star-birth region in the Large Magellanic Cloud (LMC), a satellite galaxy of our Milky Way. (Credit: NASA, ESA, F. Paresce (INAF-IASF, Bologna, Italy), R. O'Connell (University of Virginia, Charlottesville), and the Wide Field Camera 3 Science Oversight Committee)

ScienceDaily (Dec. 20, 2009) — Just in time for the holidays: a Hubble Space Telescope picture postcard of hundreds of brilliant blue stars wreathed by warm, glowing clouds. The festive portrait is the most detailed view of the largest stellar nursery in our local galactic neighborhood.

The massive, young stellar grouping, called R136, is only a few million years old and resides in the 30 Doradus Nebula, a turbulent star-birth region in the Large Magellanic Cloud (LMC), a satellite galaxy of our Milky Way. There is no known star-forming region in our galaxy as large or as prolific as 30 Doradus.

Many of the diamond-like icy blue stars are among the most massive stars known. Several of them are over 100 times more massive than our Sun. These hefty stars are destined to pop off, like a string of firecrackers, as supernovas in a few million years.

The image, taken in ultraviolet, visible, and red light by Hubble's Wide Field Camera 3, spans about 100 light-years. The nebula is close enough to Earth that Hubble can resolve individual stars, giving astronomers important information about the stars' birth and evolution.

The brilliant stars are carving deep cavities in the surrounding material by unleashing a torrent of ultraviolet light, and hurricane-force stellar winds (streams of charged particles), which are etching away the enveloping hydrogen gas cloud in which the stars were born. The image reveals a fantasy landscape of pillars, ridges, and valleys, as well as a dark region in the center that roughly looks like the outline of a holiday tree. Besides sculpting the gaseous terrain, the brilliant stars can also help create a successive generation of offspring. When the winds hit dense walls of gas, they create shocks, which may be generating a new wave of star birth.

The movement of the LMC around the Milky Way may have triggered the massive cluster's formation in several ways. The gravitational tug of the Milky Way and the companion Small Magellanic Cloud may have compressed gas in the LMC. Also, the pressure resulting from the LMC plowing through the Milky Way's halo may have compressed gas in the satellite. The cluster is a rare, nearby example of the many super star clusters that formed in the distant, early universe, when star birth and galaxy interactions were more frequent. Previous Hubble observations have shown astronomers that super star clusters in faraway galaxies are ubiquitous.

The LMC is located 170,000 light-years away and is a member of the Local Group of Galaxies, which also includes the Milky Way.

The Hubble observations were taken Oct. 20-27, 2009. The blue color is light from the hottest, most massive stars; the green from the glow of oxygen; and the red from fluorescing hydrogen.

Story Source:

Adapted from materials provided by Space Telescope Science Institute (STScI).

http://www.sciencedaily.com/releases/2009/12/091218132035.htm

Food-Borne Illness: Researchers Redefine the Invasion Mechanism of Salmonella

The invasion of Salmonellen (red) can occur with ruffles (arrows, upper picture) as well as without ruffles (lower picture). (Credit: Scanning electrone microscope picture: Manfred Rohde (HZI))

ScienceDaily (Dec. 20, 2009) — Bacteria of the genus Salmonella cause most food-borne illnesses. The bacteria attach to cells of the intestinal wall and induce their own ingestion by cells of the intestinal epithelium. Up till now, researchers assumed that Salmonella have to induce the formation of distinctive membrane waves in order to invade these gut cells. Researchers from the Helmholtz Centre for Infection Research in Braunschweig, Germany, now refuted this common doctrine.

"Based on our data, the molecular mechanism of infection employed by *Salmonella* has to be revised," says Klemens Rottner, head of the HZI research group "Cytoskeleton Dynamics." The group's results have now been published in the current issue of the scientific journal *Cellular Microbiology*.

Salmonella are highly adaptive bacteria. They can live in the presence and absence of oxygen and thus propagate in the gut. The ingestion by humans occurs mainly via contaminated egg dishes such as mayonnaise or raw milk products as well as meat or sausages. Infections with *Salmonella* lead to severe diarrhea and fever, particularly in patients harbouring a compromised immune system.

Although *Salmonella* are long-known pathogens, the precise mechanisms of infection are incompletely understood. The bacteria inject a protein cocktail using a "molecular syringe" into host cells, leading to dramatic rearrangements of cytoskeletal filaments below the cell membrane. As a result, membrane

waves are formed, which enclose the bacteria, and apparently facilitate their invasion. Those characteristic membrane waves are called "ruffles," the process is known as "ruffling." Until now, researchers regarded the formation of these ruffles as absolutely essential for bacterial entry.

In a collaborative effort, HZI research groups "Cytoskeleton dynamics" and "Signalling and Motility" now succeeded in shedding new light on the infection strategy of *Salmonella*. "We wanted to improve our mechanistic understanding of how *Salmonella* invade their host cells," says Jan Hänisch, who performed most experiments in the course of his PhD-thesis. Cells that were engineered to lack those membrane ruffles normally induced during *Salmonella* infection still engulfed the bacteria. "We showed for the first time that membrane ruffles are not essential for the bacteria to penetrate the host cell membrane." Since ruffling was used so far as signature of successful host cell invasion by this pathogen, the usefulness of such methods has to be reconsidered.

Finally, the researchers discovered a new piece in the puzzle of *Salmonella* entry, called WASH. This novel factor promotes bacterial invasion by contributing to the formation of host cell cytoskeletal filaments important for entry. "Our results have significant impact on the molecular and mechanistic understanding of the infection strategy used by this pathogen," says Rottner, "and on the development of novel strategies to screen for potential inhibitors of the entry process in the future."

Story Source:

Adapted from materials provided by Helmholtz Association of German Research Centres, via EurekAlert!, a service of AAAS.

Journal Reference:

1. Hänisch J, Ehinger J, Ladwein M, Rohde M, Derivery E, Bosse T, Steffen A, Bumann D, Misselwitz B, Hardt WD, Gautreau A, Stradal TE, Rottner K. **Molecular dissection of Salmonella-induced membrane ruffling versus invasion**. *Cellular Microbiology*, 2010; 12 (1): 84 DOI: 10.1111/j.1462-5822.2009.01380.x

http://www.sciencedaily.com/releases/2009/12/091217102246.htm

Dyslexia: Some Very Smart Accomplished People Cannot Read Well

Contrary to popular belief, some very smart, accomplished people cannot read well. This unexpected difficulty in reading in relation to intelligence, education and professional status is called dyslexia, and researchers have presented new data that explain how otherwise bright and intelligent people struggle to read. (Credit: iStockphoto)

ScienceDaily (Dec. 19, 2009) — Contrary to popular belief, some very smart, accomplished people cannot read well. This unexpected difficulty in reading in relation to intelligence, education and professional status is called dyslexia, and researchers at Yale School of Medicine and University of California Davis, have presented new data that explain how otherwise bright and intelligent people struggle to read.

The study, which will be published in the January 1, 2010 issue of the journal *Psychological Science,* provides a validated definition of dyslexia. "For the first time, we've found empirical evidence that shows the relationship between IQ and reading over time differs for typical compared to dyslexic readers," said Sally E. Shaywitz, M.D., the Audrey G. Ratner Professor in Learning Development at Yale School of Medicine's Department of Pediatrics, and co-director of the newly formed Yale Center for Dyslexia and Creativity.

Using data from the Connecticut Longitudinal Study, an ongoing 12-year study of cognitive and behavioral development in a representative sample of 445 Connecticut schoolchildren, Shaywitz and her team tested each child in reading every year and tested for IQ every other year. They were looking for evidence to show how the dissociation between cognitive ability and reading ability might develop in children.

The researchers found that in typical readers, IQ and reading not only track together, but also influence each other over time. But in children with dyslexia, IQ and reading are not linked over time and do not influence one another. This explains why a dyslexic can be both bright and not read well.

"I've seen so many children who are struggling to read but have a high IQ," said Shaywitz. "Our findings of an uncoupling between IQ and reading, and the influence of this uncoupling on the developmental trajectory of reading, provide evidence to support the concept that dyslexia is an unexpected difficulty with reading in children who otherwise have the intelligence to learn to read."

Typical readers learn how to associate letters with a specific sound. "All they have to do is look at the letters and it's automatic," Shaywitz explained. "It's like breathing; you don't have to tell your lungs to take in air. In dyslexia, this process remains manual." Each time a dyslexic sees a word, it's as if they've never seen it before. People with dyslexia have to read slowly, re-read, and sometimes use a marker so they don't lose their place.

"A key characteristic of dyslexia is that the unexpected difficulty refers to a disparity within the person rather than, for example, a relative weakness compared to the general population," said co-author Bennett A. Shaywitz, M.D., the Charles and Helen Schwab Professor in Dyslexia and Learning Development and co-director of the Yale Center for Dyslexia and Creativity.

Sally Shaywitz estimates that one in five people are dyslexic and points to many accomplished writers, physicians and attorneys with dyslexia who struggle with the condition in their daily lives, including Carol Greider, the 2009 Nobel laureate in medicine. She hopes to dispel many of the myths surrounding the condition.

"High-performing dyslexics are very intelligent, often out-of-the box thinkers and problem-solvers," she said. "The neural signature for dyslexia is seen in children and adults. You don't outgrow dyslexia. Once you're diagnosed, it is with you for life."

Shaywitz also stresses that the problem is with both basic spoken and written language. People with dyslexia take a long time to retrieve words, so they might not speak or read as fluidly as others. In students, the time pressure around standardized tests like the SATs and entrance exams for professional schools increases anxiety and can make dyslexia worse, so the need for accommodations is key in helping those with the disorder realize their potential, she says.

Other authors on the study include Emilio Ferrer at the University of California Davis and John M. Holahan and Karen Marchione at Yale School of Medicine.

The study was funded by the National Institute of Child Health and Human Development, the National Science Foundation, and the National Institute of Neurological Disorders and Stroke.

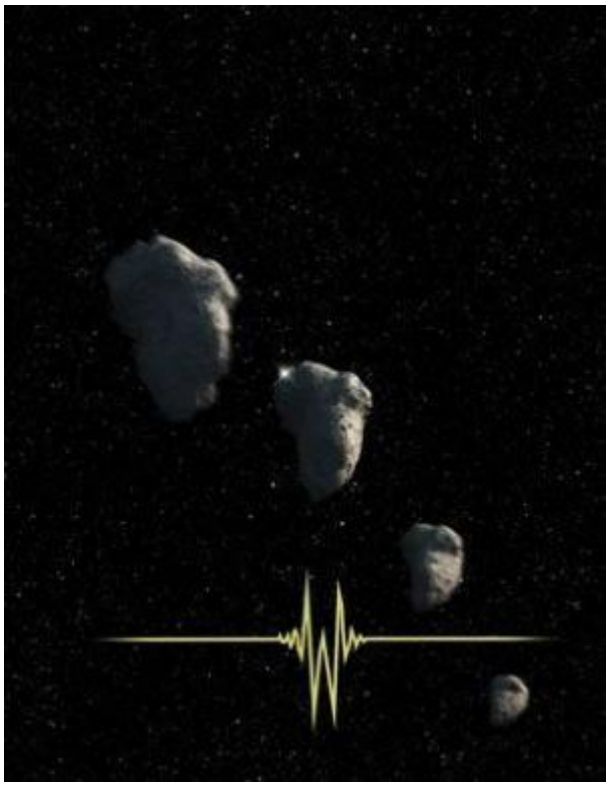
Citation: *Psychological Science* (January 1, 2010)

Story Source:

Adapted from materials provided by Yale University.

http://www.sciencedaily.com/releases/2009/12/091217150838.htm

Hubble Finds Smallest Kuiper Belt Object Ever Seen



This is an artist's impression of a small Kuiper Belt Object (KBO) occulting a star. NASA's Hubble Space Telescope recorded this brief event and allowed astronomers to determine that the KBO was only one-half of a mile across, setting a new record for the smallest object ever seen in the Kuiper Belt. (Credit: NASA, ESA, and G. Bacon (STScI))

ScienceDaily (Dec. 19, 2009) — NASA's Hubble Space Telescope has discovered the smallest object ever seen in visible light in the Kuiper Belt, a vast ring of icy debris that is encircling the outer rim of the solar system just beyond Neptune.

The needle-in-a-haystack object found by Hubble is only 3,200 feet across and a whopping 4.2 billion miles away. The smallest Kuiper Belt Object (KBO) seen previously in reflected light is roughly 30 miles across, or 50 times larger.

This is the first observational evidence for a population of comet-sized bodies in the Kuiper Belt that are being ground down through collisions. The Kuiper Belt is therefore collisionally evolving, meaning that the region's icy content has been modified over the past 4.5 billion years.

The object detected by Hubble is so faint -- at 35th magnitude -- it is 100 times dimmer than what the Hubble can see directly.

So then how did the space telescope uncover such a small body?

In a paper published in the December 17th issue of the journal *Nature,* Hilke Schlichting of the California Institute of Technology in Pasadena, Calif., and her collaborators are reporting that the telltale signature of the small vagabond was extracted from Hubble's pointing data, not by direct imaging.

Hubble has three optical instruments called Fine Guidance Sensors (FGS). The FGSs provide high-precision navigational information to the space observatory's attitude control systems by looking at select guide stars for pointing. The sensors exploit the wavelike nature of light to make precise measurement of the location of stars.

Schlichting and her co-investigators determined that the FGS instruments are so good that they can see the effects of a small object passing in front of a star. This would cause a brief occultation and diffraction signature in the FGS data as the light from the background guide star was bent around the intervening foreground KBO.

They selected 4.5 years of FGS observations for analysis. Hubble spent a total of 12,000 hours during this period looking along a strip of sky within 20 degrees of the solar system's ecliptic plane, where the majority of KBOs should dwell. The team analyzed the FGS observations of 50,000 guide stars in total.

Scouring the huge database, Schlichting and her team found a single 0.3-second-long occultation event. This was only possible because the FGS instruments sample changes in starlight 40 times a second. The duration of the occultation was short largely because of the Earth's orbital motion around the Sun.

They assumed the KBO was in a circular orbit and inclined 14 degrees to the ecliptic. The KBO's distance was estimated from the duration of the occultation, and the amount of dimming was used to calculate the size of the object. "I was very thrilled to find this in the data," says Schlichting.

Hubble observations of nearby stars show that a number of them have Kuiper Belt-like disks of icy debris encircling them. These disks are the remnants of planetary formation. The prediction is that over billions of years the debris should collide, grinding the KBO-type objects down to ever smaller pieces that were not part of the original Kuiper Belt population.

The finding is a powerful illustration of the capability of archived Hubble data to produce important new discoveries. In an effort to uncover additional small KBOs, the team plans to analyze the remaining FGS data for nearly the full duration of Hubble operations since its launch in 1990.

Story Source:

Adapted from materials provided by Space Telescope Science Institute (STScI).

http://www.sciencedaily.com/releases/2009/12/091218131604.htm

Within a Cell, Actin Keeps Things Moving

UO chemist Andrew Marcus has found that actin recruited by mitochondrial cells drive transport in budding yeast cells. (Credit: University of Oregon)

ScienceDaily (Dec. 19, 2009) — Using new technology developed in his University of Oregon lab, chemist Andrew H. Marcus and his doctoral student Eric N. Senning have captured what they describe as well-orchestrated, actin-driven, mitochondrial movement within a single cell.

That movement -- documented in a paper appearing online the week of Dec. 14-18 ahead of regular publication in the *Proceedings of the National Academy of Sciences* -- appears to be coordinated by mitochondria's recruitment of actin-related proteins that rapidly assemble into extended fractal-like structures in a molecular chemical reaction known as polymerization. The coordinated movement of mitochondria is important for reproduction of identical daughter cells, and the sorting of mitochondrial DNA into the spinoff cells.

The research was done with a molecular fluorescence technology called Fourier imaging correlation spectroscopy that allows researchers using focused laser beams to see, measure and map the intermittent movement of mitochondria at micron scales.

Marcus will discuss the technology, developed with funding from the National Institutes of Health and National Science Foundation, at the 2010 annual meeting of the American Physical Society in Portland, Ore., in March. It also was detailed in a paper published online in October by the journal Annual Reviews of Physical Chemistry.

In their project -- funded by the NIH -- Senning and Marcus looked at actin's behavior using inhibitory agents to monitor mitochondrial activity in Saccharomyces cerevisiae, a species of budding yeast often used in research. They also introduced two defective forms of the protein. Their technique included the use of hormones to trick a yeast cell into thinking it was about to mate, so that it stops dividing and sits and fluctuates -- much like a car in idle. From this state, the images are drawn.

The picture that emerged, Marcus said, was that actin is drawn to the surfaces of mitochondria to regulate the polymerization machinery so that it operates in an efficient, organized manner. The findings, the researchers wrote, lend support to an existing model in which non-equilibrium forces are directly coupled to mitochondrial membrane surfaces.

In effect, the findings support the idea that despite the cramped quarters of molecules in densely packed cells, intracellular transport is accomplished by coordinating the movements of a multi-faceted machine, rather than resulting from random (Brownian) movements of material based on what obstacles will allow.

The quest for understanding the machinery is more than just biological, where this research provides insight into how the cell moves its mitochondria into the daughter cells, Marcus said. The knowledge could become useful in the production of nanotechnology devices.

"A central question in modeling cell transport is whether the cytoplasm may be viewed as a simple extension of a complex fluid at equilibrium or if non-equilibrium effects dominate the motions of intracellular species," he said. "If somebody wants to design a micron-scale machine or make a self-replicating device, one would have to have these physical principles in place. One would need to have a motor in place and know how much force the motor needs to apply, either cooperatively or individually with other components."

Story Source:

Adapted from materials provided by University of Oregon.

http://www.sciencedaily.com/releases/2009/12/091217133740.htm

Why Does a Human Baby Need a Full Year Before Starting to Walk?

Why does a human baby need a full year before it can start walking, while a newborn foal gets up on its legs almost directly after birth? (Credit: iStockphoto/Beth Jeppson)

ScienceDaily (Dec. 19, 2009) — Why does a human baby need a full year before it can start walking, while a newborn foal gets up on its legs almost directly after birth? Scientist have assumed that human motor development is unique because our brain is unusually complex and because it is particularly challenging to walk on two legs. But now a research group at Lund University in Sweden has shown that human babies in fact start walking at the same stage in brain development as most other walking mammals, from small rodents to elephants.

The findings are published in the journal *PNAS.*

The Lund group consists of neurophysiologists Martin Garwicz and Maria Christensson and developmental psychologist Elia Psouni. Contrary to convention, they used conception and not birth as the starting point of motor development in their comparison between different mammals. This revealed astonishing similarities among species that diverged in evolution as much as 100 million years ago. -- Humans certainly have more brain cells and bigger brains than most other terrestrial mammalian species, but with respect to walking, brain development appears to be similar for us and other mammals. Our study demonstrates that the difference is quantitative, not qualitative, says Martin Garwicz.

Based on knowledge about development in other mammals it is therefore possible to actually predict with high precision when human babies will start to walk. This is a very unexpected and provocative finding.

The notion that humans have a unique position among mammals is not only deeply rooted among lay people, but is also reflected in fundamental assumptions in different research fields related to human development and human brain evolution.

"Our study strongly contradicts this assumption and thereby sheds new light on theories in, for instance, evolutionary and developmental biology," says Martin Garwicz. "On the other hand, our findings fit well with the substantial similarities between the genomes of different mammals. Perhaps these similarities are after all not that surprising -- although the end products 'human' and 'rat' may be very different, our study

suggests that the building blocks and principles for how these building blocks interact with one another during development could be the same."

The study originated in an attempt by the group to translate behavioral milestones of motor development between two distantly related species. The similarities in relative developmental time courses between the two species were so striking that the scientists started to wonder whether the regularity applied to other mammals and ultimately also to humans.

The Lund group has now compared 24 species, which together represent the majority of existing walking mammals. Some, like the great apes, are closely related to us evolutionarily while others, such as rodents, hoofed animals, and elephants, diverged from our evolutionary path about 90-100 million years ago.

Despite this, and regardless of differences in various species' brain and body size, gestation time, and brain maturity at birth, the comparison shows that the young from all species start walking at the same relative time point in brain development. Humans may be unique, but not in this particular way. When the nervous system has reached a given level of maturity, you learn to walk, whether you are a hedgehog, a foal, or a human baby...

Story Source:

Adapted from materials provided by Lund University, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/12/091215160851.htm

Immune Cell Activity Linked to Worsening COPD

ScienceDaily (Dec. 19, 2009) — A new study links chronic obstructive pulmonary disease, or COPD, with increased activity of cells that act as sentinels to activate the body's immune system.

The University of Michigan and Veterans Affairs research adds to growing awareness of the immune system's role in COPD, a serious, progressive lung disease that affects more than 12 million Americans with wheezing, shortness of breath, chest tightening and other symptoms. Understanding immune factors is key if doctors are to find better ways to detect and treat the disease early when patients might benefit most, believe some COPD researchers.

Nearly all people diagnosed with COPD have emphysema or chronic bronchitis or most commonly, both conditions. COPD is the fourth leading cause of death in the United States. Most people with COPD are smokers or former smokers.

"We found that dendritic cells, a type of immune cell that initiates immune responses, are in the lung interacting with lymphocytes, and that these dendritic cells seem to get more active as the disease goes on. If we could alter or stop their action, perhaps we could stop the disease from progressing," says the study's senior author Jeffrey L. Curtis, M.D., professor of internal medicine at the U-M Medical School and chief of the pulmonary and critical care medicine section at the VA Ann Arbor Healthcare System.

The study appears in the December 15 issue of the *American Journal of Respiratory and Critical Care Medicine*.

Lung damage occurs well before people with COPD are aware of symptoms. By the time they seek medical help, the destructive forces of chronic lung inflammation often have taken a heavy toll. Immune cells in repetitive overdrive play a key role in that inflammation response, COPD researchers increasingly believe.

Research details

Curtis and his research team analyzed the activity of dendritic cells and other immune cells in lung tissue from patients at early and more severe stages of COPD. They found that as the disease progresses, multiple types of dendritic cells located in different parts the lung produce more of a stimulatory molecule associated with increased immune system activity. They also found two significant signs of increased activity in CD4+ T cells, important immune cells that, when activated, communicate with and direct other immune cells.

"Our data suggest that CD4+ T cells are more activated in later stages of COPD," says Christine M. Freeman, the study's first author and a research investigator in internal medicine at U-M.

"This is not necessarily a good thing, because increased activation suggests that there is an inappropriate and excessive immune response taking place in the lungs of patients with severe COPD."

One strategy to help prevent COPD from worsening could be to make dendritic cells less inflammatory, says Curtis, adding that it is a significant challenge to intervene in the immune system without undermining its ability to fight infection.

Key facts about COPD

Chronic obstructive pulmonary disease, or COPD, is a leading cause of disability and killed more than 125,000 Americans over age 25 in 2005. It affects slightly more women than men.

Most people under the umbrella term COPD have emphysema or chronic bronchitis, or both. But asthma, respiratory infections, air pollutants and genetic factors also play a role.

People with emphysema suffer from severe shortness of breath that makes even simple daily tasks like dressing difficult. People with chronic bronchitis experience difficulty breathing, coughing and excessive mucus.

An estimated 40 percent of smokers get COPD. Recent research suggests the disease is more common than previously thought.

Ex-smokers remain at risk. It's common for symptoms to arise in ex-smokers even decades after they have quit smoking.

"Even if everyone in the world stopped smoking today, we would be dealing with the effects of this for 40 years," says Curtis.

Few treatments are very effective. Corticosteroids are of limited use in reducing inflammation.

People with COPD experience higher levels of depression and anxiety that those with other chronic diseases such as cancer and diabetes, studies have shown.

Story Source:

Adapted from materials provided by University of Michigan Health System, via EurekAlert!, a service of AAAS.

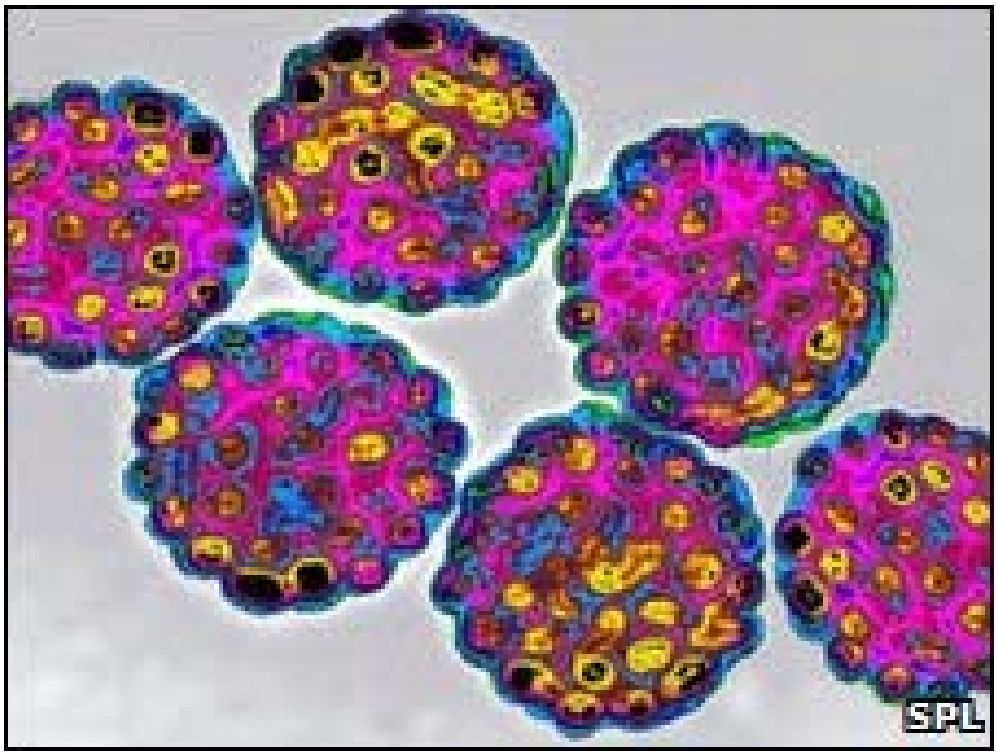
Journal Reference:

1. Christine M. Freeman, Fernando J. Martinez, MeiLan K. Han, Theresa M. Ames, Stephen W. Chensue, Jill C. Todt, Douglas A. Arenberg, Catherine A. Meldrum, Christi Getty, Lisa McCloskey, and Jeffrey L. Curtis. **Lung Dendritic Cell Expression of Maturation Molecules Increases with Worsening Chronic Obstructive Pulmonary Disease**. *American Journal of Respiratory and Critical Care Medicine*, 2009; 180 (12): 1179 DOI: 10.1164/rccm.200904-0552OC

http://www.sciencedaily.com/releases/2009/12/091215131330.htm

Cervical cancer link to early sex

Having sex at an early age can double the risk of developing cervical cancer, a study of 20,000 women suggests.



The investigation into why poorer women have a higher risk of the disease found they tended to have sex about four years earlier than more affluent women.

Previously, it had been thought the disparity was the result of low screening uptake in poorer areas.

The International Agency for Research on Cancer findings are published in the British Journal of Cancer.

Although the difference in cervical cancer incidence between rich and poor - across the world - had been noted for many years, it was not clear why this is the case.

Especially as rates of infection with human papillomavirus (HPV) - the sexually transmitted infection linked with the vast majority of cervical cancers - seemed to be similar across all groups.

The study confirmed that the higher rates of cervical cancer were not linked to higher HPV levels.

" **Although women can be infected by HPV at any age, infections at a very young age may be especially dangerous as they have more time to cause damage that eventually leads to cancer** "
Dr Lesley Walker, Cancer Research UK

But what it did reveal is that the two-fold increased risk was largely explained by women from poorer backgrounds starting to have sex at a younger age.

The age at which a woman had her first baby was also an important factor.

Screening was found to have some effect on the level of risk.

But the number of sexual partners a woman has and smoking did not account for any of the difference.

Lag time

Study leader, Dr Silvia Franceschi, said the findings were not restricted to adolescence and the risk of cervical cancer was also higher in women who had their first sexual intercourse at 20 rather than 25 years.

"In our study, poorer women had become sexually active on average four years earlier.

"So they may have also been infected with HPV earlier, giving the virus more time to produce the long sequence of events that are needed for cancer development."

Dr Lesley Walker, director of cancer information at Cancer Research UK, said the study raised some interesting questions.

"Although women can be infected by HPV at any age, infections at a very young age may be especially dangerous as they have more time to cause damage that eventually leads to cancer.

"Importantly, the results back up the need for the HPV vaccination to be given in schools at an age before they start having sex, especially among girls in deprived areas."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8420690.stm

Published: 2009/12/21 03:51:13 GMT

Branch clue to child bone secrets

Children traditionally break their bones falling out of trees, but a scientist says branches hold clues to a particular type of childhood fracture.

The "greenstick fracture" happens when the bone splits lengthwise, rather than cleanly at right angles.

Dr Roland Ennos, from Manchester University, thinks similarities between crystals in young bone and cells in young wood could explain this.

His research is published in the scientific journal Proceedings B.

" **People have been looking at the relationship between bone structure and strength for some time, and this looks at it from another direction** "
Professor Jonathan Tobias University of Bristol

The way bone structure develops in children and young adults is still not fully understood by scientists.

However, "greenstick fractures" are known to be more common around puberty, when bones are growing quickly.

Dr Ennos suggests that, like the cells in young wood, the bone crystals being deposited in fast-growing young bone are arranged lengthways, before being remodelled so that the crystals point in different directions.

The lengthways arrangement could make them more likely to break along those lines, just as they do in growing sticks of wood, he said.

"Bones are remodelled to stop cracks from developing - the crystals dissolve and are relaid in those places. Children's bones have not had time to do that."

He said that orthopaedic experts might be able to look into the idea further.

Professor Jonathan Tobias, a researcher in child bone health from the University of Bristol, said that the observation was an "interesting concept", although unlikely to have a direct impact on clinical practice.

"People have been looking at the relationship between bone structure and strength for some time, and this looks at it from another direction.

"We are certainly aware that there is an issue between growing bones at puberty and this type of fracture."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8416597.stm

Published: 2009/12/21 03:55:29 GMT

Upper Mismanagement
Why can't Americans make things? Two words: business school.

- Noam Scheiber
- December 18, 2009

One of the themes that came up while I was profiling [1] White House manufacturing czar Ron Bloom earlier this fall was managerial talent. A lot of people talk about reviving the domestic manufacturing sector, which has shed almost one-third of its manpower over the last eight years. But some of the people I spoke to asked a slightly different question: Even if you could reclaim a chunk of those blue-collar jobs, would you have the managers you need to supervise them?

It's not obvious that you would. Since 1965, the percentage of graduates of highly-ranked business schools who go into consulting and financial services has doubled, from about one-third to about two-thirds. And while some of these consultants and financiers end up in the manufacturing sector, in some respects that's the problem. Harvard business professor Rakesh Khurana, with whom I discussed these questions at length, observes that most of GM's top executives in recent decades hailed from a finance rather than an operations background. (Outgoing GM CEO Fritz Henderson and his failed predecessor, Rick Wagoner, both worked their way up from the company's vaunted Treasurer's office.) But these executives were frequently numb to the sorts of innovations that enable high-quality production at low cost. As Khurana quips, "That's how you end up with GM rather than Toyota."

How did we get to this point? In some sense, it's the result of broad historical and economic forces. Up until World War I, the archetypal manufacturing CEO was production oriented—usually an engineer or inventor of some kind. Even as late as the 1930s, business school curriculums focused mostly on production. Khurana notes that many schools during this era had mini-factories on campus to train future managers.

After World War II, large corporations went on acquisition binges and turned themselves into massive conglomerates. In their landmark *Harvard Business Review* article from 1980, "Managing Our Way to Economic Decline," Robert Hayes and William Abernathy pointed out that the conglomerate structure forced managers to think of their firms as a collection of financial assets, where the goal was to allocate

capital efficiently, rather than as makers of specific products, where the goal was to maximize quality and long-term* market share.

By the 1980s, the conglomerate boom was reversing itself. Investors began seizing control of overgrown public companies and breaking them up. But this task was, if anything, even more dependent on fluency in financial abstractions. The leveraged-buyout boom produced a whole generation of finance tycoons—the Michael Milkens of the world—whose ability to value corporate assets was far more important than their ability to run them.The new managerial class tended to neglect process innovation because it was hard to justify in a quarterly earnings report, where metrics like "return on investment" reigned supreme. "In an era of management by the numbers, many American managers … are reluctant to invest heavily in the development of new manufacturing processes," Hayes and Abernathy wrote. "Many of them have effectively forsworn long-term technological superiority as a competitive weapon." By contrast, European and Japanese manufacturers, who lived and died on the strength of their exports, innovated relentlessly. One of Toyota's most revolutionary production techniques is to locate suppliers inside its own factories. *The New York Times*' Jon Gertner recently visited a Toyota plant and reported [2] that the company doesn't actually order a seat for a new truck until the chassis hits the assembly line, at which point the seat is promptly built on-site and installed. "If the front seat had not been ordered 85 minutes earlier, it would not exist," Gertner observed. Alas, these aren't the kinds of money-saving breakthroughs the GM brain trust has ever excelled at.

The country's business schools tended to reflect and reinforce these trends. By the late 1970s, top business schools began admitting much higher-caliber students than they had in previous decades. This might seem like a good thing. The problem is that these students tended to be overachiever types motivated primarily by salary rather than some lifelong ambition to run a steel mill. And there was a lot more money to be made in finance than manufacturing. A recent paper by economists Thomas Philippon and Ariell Reshef shows that compensation in the finance sector began a sharp, upward trajectory around 1980.

The business schools had their own incentives to channel students into high-paying fields like finance, thanks to the rising importance of school rankings, which heavily weighted starting salaries. The career offices at places like Harvard, Stanford, and Chicago institutionalized the process—for example, by making it easier for Wall Street outfits and consulting firms to recruit on campus. A recent Harvard Business School case study about General Electric shows that the company had so much trouble competing for MBAs that it decided to woo top graduates from non-elite schools rather than settle for elite-school graduates in the bottom half or bottom quarter of their classes.

No surprise then that, over time, the faculty and curriculum at the Harvards and Stanfords of the world began to evolve. "If you look at the distribution of faculty at leading business schools," says Khurana, "they're mostly in finance. … Business schools are responsive to changes in the external environment." Which meant that, even if a student aspired to become a top operations man (or woman) at a big industrial company, the infrastructure to teach him didn't really exist.In fairness, all that financial expertise we've been churning out hasn't been a complete waste (much as it may seem that way today). Many of the financial restructurings of the '80s and '90s made the economy more efficient and competitive. Likewise, it would be ludicrous to suggest that simply changing the culture of business schools would single-handedly revive U.S. manufacturing. As I explained in the Ron Bloom piece, that sector faces a variety of challenges, not least the mercantilist industrial policies of our foreign competitors.

On the other hand, it's hard to believe that American manufacturing has a chance of recovering unless business schools start producing people who can run industrial companies, not just buy and sell their assets. And we're pretty far away from that point today.

Noam Scheiber is a senior editor of The New Republic.

http://www.tnr.com/article/economy/wagoner-henderson

The Animator

- Adam Thirwell
- December 19, 2009 | 12:00 am

Charles Dickens

Michael Slater

Yale University Press, 696 pp., $35

I.

For a long time, everyone has known that Paris was the capital of the nineteenth century, the city where the modern was invented: the society of the spectacular. But everyone was wrong. The capital of the nineteenth century was London. Think about it. Walter Benjamin's symbol of the Parisian modern was the arcade. The arcade! In London-according to the social campaigner Henry Mayhew, there were 300,000 dustbins, 300,000 cesspools, and three million chimneys. It was there that the truly modern was invented: industrial, overpopulated dirt. Its symbol was the slum. London was managed by a majority of minority trades, all in the business of garbage: bone-pickers, rag-gatherers, pure-finders, dredgermen, toshers. And London's greatest describer, who converted the ghostly industrial city into a new world of words, was a novelist who could taxonomically and poetically enumerate, say, the varieties of polluted fog: "Even in the surrounding country it was a foggy day, but there the fog was grey, whereas in London it was, at about the boundary line, dark yellow, and a little within it brown, and then browner, and then browner, until at the heart of the City--which call Saint Mary Axe--it was rusty-black."

And yet, in public, this same writer could also put on an act like this:

Believe me, ladies and gentlemen, that to the earnestness of my aim and desire to do right by my readers, and to leave our imaginative and popular literature more closely associated than I found it at once with the private homes and public rights of the English people, I shall ever be faithful,--to my death-in the principles which have won your approval. [Loud applause.]

Charles Dickens gave this sincere speech in Sheffield, the city of steel factories, in December 1855, on being presented by the mayor with a service of cutlery. It is unbelievable, perhaps, but it is true: that, too, is the voice of the most avant-garde European novelist of the nineteenth century.

Of all his impersonations, Dickens's greatest was his fluent mimicry of what the bourgeois public imagined that a novelist should be--through prefaces to his novels, which offered doctored accounts of their geneses as serial sketches in magazines; through his efforts on behalf of the Guild of Literature and Art, or his work with the Royal Literary Fund; through his collected editions (he supervised the following editions: the Charles Dickens, the Cheap, the Library, the Diamond, the People's, and the Hachette). He had a mania for canonization, for the public paraphernalia of authorship.

And this extended, most importantly, to his biography. Dickens died in June 1870. Seventeen months later, in November 1871, the first *Life* of Dickens was published by his friend John Forster--an eminent man of letters, the biographer of Goldsmith, Swift, and Landor--who had been appointed Dickens's biographer by Dickens himself. Dickens gave Forster autobiographical fragments, manuscripts, letters--which were all to be kept secret until the posthumous biography. On its publication, it revealed how autobiographical much of his writing had been--"watered," as one critic wrote, "with tears of self-compassion." The pain in Dickens, it turned out, was less a moral philosophy than a natural identification with the marginalized, the defenseless, the lost. And yet such autobiographical pain did nothing to change the essential idea of Dickens as a moralist, and of his novels as didactic agents of social comment.

But the era of psychology, and of social reform, were not alive to the energy in Dickens's art. His real greatness, I think, lay elsewhere: in his savage, magical style. With the appearance of Michael Slater's extraordinary biography, which exuberantly tracks the mercurial energy of Dickens's publication history--as well as his editing and his public readings--it is possible to be accurate to Dickens's wild originality, the career of his career.The premise of this new biography is very simple, and wholly admirable. "Mindful of Dickens's words in his will about resting his claims to the remembrance of his country upon his published work," Slater declares, "I have focused primarily upon his career as a writer and professional author." The salacious reader will find the occasional brothel, the passing prostitute. But Nelly Ternan, the actress implicated in Dickens's separation from his wife around 1857 or 1858, is only a background figure: partly because Slater scrupulously refuses to speculate on unavailable evidence, but also because of his emphasis on that adjective "professional." The furious energy of Dickens's production in this biography is astonishing. As well as his novels, Slater gorgeously includes also "the context of the truly prodigious amount of *other* writing that he was constantly producing alongside the serial writing of those books"--the "short stories, sketches, topical journalism, essays, travel writing and writings for children, polemical pieces in verse as well as prose."

This is a biography of a writer as writer. It is therefore quite unique. "Overfamiliar metaphor," writes Kundera in *The Art of the Novel*: "The novelist destroys the house of his life and uses its stones to build the house of his novel. A novelist's biographers thus undo what a novelist has done, and redo what he undid." This is not true of Slater. "All their labor cannot illuminate either the value or the meaning of a novel," adds Kundera. I have always agreed with him; but this great book allows one to imagine a more delicate biographical form--a heuristic instrument for the analysis of spectral themes.For Dickens's life--like one of his novels, with its parallel plot--was ghosted by two central motifs. He is the connoisseur of characters acquiring, in the words of the old cliché, a life of their own--like Dr. Marigold, who "came flashing up in the most cheerful manner, and I had only to look on and leisurely describe it." But he is also the connoisseur of corpses. In Paris, the hidden twin to Dickens's London, his favorite destination was the morgue. Dickens digested the dead with gusto. He was drawn to the morgue--"dragged by invisible force," by "the attraction of repulsion." And this is Dickens's subject, the invention of his style: the uneasy, queasy hinterland where it is alluringly unclear what is alive and what is not.

One day, in 1911, Kafka finished reading a biography of Dickens and then turned to his diary:

Is it so difficult and can an outsider understand that you experience a story within yourself from its beginning, from the distant point up to the approaching locomotives of steel, coal, and steam, and you don't abandon it even now, but want to be pursued by it and have time for it, therefore are pursued by it and of your own volition run before it wherever it may thrust and wherever you may lure it.

In this marvelous sentence, where the subject writing and the subject written sinuously swap places, Kafka identifies the mobile essence of Dickens's lesson for fiction. His great subject is the force that gives anything animation at all. His work constitutes a sustained examination of the conditions for lifelikeness.

Dickens can animate anything. Even an oyster opener: for what happens to oyster openers, wonders Dickens, in an improvised moment in a letter from Montreal in 1842, when oysters are out of season? "Do they commit suicide in despair, or wrench open tight drawers and cupboards and hermetically-sealed

bottles for practice? Perhaps they are dentists out of the oyster season. Who knows?" Dickens's animating style discovers the uncanny energy of the commonplace. For Dickens is the great novelist of junk: the décor of hotel restaurants, the clutter of secondhand shops, the wallpaper in pretentious dance schools. London was supremely the city of the industrial, and the industrial was so savagely modern that it was impossible to keep up: everyone lived among the outmoded, among cherished objects which had lost their use value. This was Dickens's discovery--the surreal poetry of what is obsolete, or seems to be obsolete. His life was spent observing how much a life became a collection of useless, loved objects.

London was the capital of the nineteenth century, and Dickens was its greatest flaneur. In London he walked and walked--making sure of his "fifteen miles a day": "If I couldn't walk fast and far, I should just explode and perish." He was the great ambulatory writer. In particular, he liked to walk at night. Slater's biography records how much he was the genie of gaslight--able to compare, for instance, the quality of gaslight in London and in Paris: "London is shabby by daylight, and shabbier by gaslight. No Englishman knows what gaslight is, until he sees the Rue de Rivoli and the Palais Royal after dark." In Paris, illuminated, Dickens could therefore be found "wandering into Hospitals, Prisons, Dead-houses, Operas, Theatres, Concert Rooms, Burial-grounds, Palaces, and Wine shops"--which all became a private "rapid Panorama." In 1855, he mentions "some of the strange places I glide into of nights in these latitudes." The idea of gliding is wonderful; but then Dickens has a whole vocabulary of flaneuring. In London, he asks a friend to come with him on one of his "great, London, back-slums kind of walk[s]."

It was on these walks that Dickens discovered the everyday--his profane illuminations. When his sketches, which first appeared in magazines, were collected in book form, Dickens added a new term, with its hesitant hyphen: "Illustrative of Every-day Life and Every-day People." But the border between his early sketches and his serial fiction is distinctly porous. His style swarms everywhere. And the everyday was "lumber," it was junk:

The walls were garnished with one or two large maps; and several weather-beaten rough great coats, with complicated capes, dangled from a long row of pegs in one corner. The mantel-shelf was ornamented with a wooden inkstand, containing one stump of a pen and half a wafer, a road-book and directory, a county history minus the cover, and the mortal remains of a trout in a glass coffin.

The style of this flaneuring novelist was, then, founded on the observation of the city. Like all great novelists, of course, he tried to occlude the sources of his style. In one of his earliest sketches, "The Prisoner's Van," he included a brief manifesto (which he cut when the piece was collected into a book):

We have a most extraordinary partiality for lounging about in the streets. Whenever we have an hour to spare, there is nothing that we enjoy more than a little amateur vagrancy--walking up one street and down another, and staring into shop windows, and gazing about us as if, instead of being on intimate terms with every shop and house in Holborn, the Strand, Fleet-street and Cheapside, the whole were an unknown region to our wondering mind.

Dickens had the talent not to be averse to the shameful emotions--prurience, or curiosity, or self-deception, or hypocrisy: the shameful emotions without which no noble knowledge would ever be acquired. His style was formed in the voyeuristic city--London, with "that great heavy canopy," as he wrote to Bulwer Lytton in 1851, "lowering over the housetops." The walker alive to the smoggy city of junk: this was Dickens. And the usefulness of the city was very simple. London was a laboratory where the human was transformed into surface in as concentrated a form as possible. Or, as one of his best critics, John Carey, puts it, Dickens's territory was "the border country between people and things, where Dickens's imagination is mostly engaged." And so it was where everything was always on the point of transforming from the animate into the inanimate, or vice versa. For anything, and anyone, can undergo a metamorphosis: it just depends on the strength of someone else's will, desire, fetish--or belief.

II.

In his novels of reanimation, Dickens went for ghosts, for guilt, for bottled fetuses and effigies: for murder. His necromantic imagination needed corpses. Dead bodies are his constant prop. What else could he do? His subject was how strange the transition was between the live and the dead. But the motifs are all subject to the mechanics of his sentences. A sentence, for Dickens, was the medium in which he could investigate how reversible lifelikeness was. The effect of Slater's book--so lavishly truffled with quotations from the vast range of his prose--is to emphasize how thoroughly Dickens was inhabited by this process of style. His life was itself a constant experiment of writing, of quickening by form. And so we must take the time to enumerate the elements of Dickens's sentences. They constitute the true events, after all, of any novelist's biography.

In 1869, in his inaugural address as president of the Birmingham & Midland Institute, Dickens confessed something to his audience: "My own invention or imagination, such as it is, I can most truthfully assure you, would never have served me as it has, but for the habit of commonplace, humble, patient, daily, toiling, drudging attention." Drudgery is the ritual of Dickensian transformation. It enabled inspired detailing, such as a slum with its "starved white horse who was making a meal of oyster-shells." And it also produced exuberant squiggles: a child reading the newspapers, "which are so very large in proportion to himself, shorn of his hat, that when he holds up *The Times* to run his eye over the columns, he seems to have retired for the night, and to have disappeared under the bedclothes." And it emerged in the full dense complexity of a sentence like this: "Smoke lowering down from chimney-pots, making a soft black drizzle, with flakes of soot in it as big as full-grown snow-flakes--gone into mourning, one might imagine, for the death of the sun." The sentence describes a comic apocalypse--but then Dickens's style itself may be called a comic apocalypse, energized by the twin engines of personification and metaphor, where everything and everyone can be transformed into the uncannily alive or the uncannily dead. So it becomes impossible to say how far a metaphor is ornament, or instead a precise description of what is seen.

Dickens's techniques are constant experiments with what we accept to be real. And so, alongside the metaphoric transformation of the everyday, he loved inversely to transform everyday metaphoric activity into literal sentences. The revolutionary Russian critic Shklovsky once suggested that literary style was there to increase our knowledge of reality: "to lead us to a 'vision' of this object rather than mere 'recognition.'" His example was Tolstoy's baroquely literal description of an opera: "In the middle of the stage sat young girls in red bodices and white skirts. One young girl, very fat, and attired in white silk, was sitting separately on a low bench to which a green cardboard was attached from behind. They were all singing something." But Dickens had been there already--more intensely, poetically literal than Tolstoy--watching *Macbeth* at the Theatre Royal in Chatham, confused by the ontology of double casting: "Many wondrous secrets had I come to the knowledge of in that sanctuary: of which not the least were, that the witches in *Macbeth* bore an awful resemblance to the Thanes and other proper inhabitants of Scotland; and that the good King Duncan couldn't rest in his grave, but was constantly coming out of it and calling himself somebody else."

His sentences are festivals of the flickering, the passing, the dying, the obsolete. He inherits the use of junk allusion invented by the English poets: by Pope, and Swift, and Dryden--the geniuses of mock epic. (Henry Fielding's description of what he was up to in his novels was, significantly, this doubly oxymoronic definition: a "comic Epic-Poem in Prose.") In *The Pickwick Papers*, the everyday kitsch allusion is duly incorporated: "'Mrs. Leo Hunter has many of these breakfasts, sir,' resumed the new acquaintance--'"feasts of reason, sir, and flows of soul," as somebody who wrote a sonnet to Mrs. Leo Hunter on her breakfasts, feelingly and originally observed.'" For what is more junk than unwittingly plagiarizing Pope, the greatest ironist of the glibly serious? But Dickens's true innovation is to incorporate this kitsch appropriation of the classics into his own mobile narrative voice, as in his Hamletian description of

the Harmonic Meeting at the Sol's Arms; where the sound of the piano through the partly-opened windows jingles out into the court, and where Little Swills, after keeping the lovers of harmony in a roar

like a very Yorick, may now be heard taking the gruff line in a concerted piece, and sentimentally adjuring his friends and patrons to Listen, listen, listen, Tew the wa-ter-Fall!

(The Sol's Arms, I should add, whose tables are hyper-realistically "ornamented with glutinous rings in endless involutions, made by pots and glasses.")

The profound innovation of Dickens's style is in this way of describing the human as endless superficiality, infinitely bathetic: a bricolage of bric-a-brac. His profundity is precisely in the refusal of depth. He is often attacked for the creation of caricatures, not characters. As a binary opposition, this seems as uselessly simplistic as Forster's division of characters into the flat and the round. It fails to honor the way his vision of what is real, what is alive, is tense with what is dead. His characters, therefore, are necessarily collections of repetitions. When describing the character of Skimpole in *Bleak House*, Dickens described him as "a delightful manner reproducing itself under my hand." A character, for Dickens, is a self-reproducing entity; as artificial as a self--another system of repetition.

Famously, Dickens's daughter Mamie recorded interrupting her father at composition--when he was, she said, performing a "facial pantomime" in front of the mirror. Dickens did not invent: he imitated, he mimicked. "I don't invent it--really do not, *but see it*, and write it down." Instead of the novel as psychology, he copied out his hallucinations: the repetitive gestures of his characters' bodies, the repetitive jingles of their speech. With these gestures and jingles, he constructed the collages of his scenes:

"We are all weak creeturs," said Mrs. Corney, laying down a general principle."So we are," said the beadle.Nothing was said, on either side, for a minute or two afterwards. By the expiration of that time, Mr. Bumble had illustrated the position by removing his left arm from the back of Mrs. Corney's chair, where it had previously rested, to Mrs. Corney's apron-string, round which it gradually became entwined."We are all weak creeturs," said Mr. Bumble.Every novel by Dickens is already an illustrated novel. The actual illustrations are just confirmations, tautologies.

III.

But it is not just the sentences. Dickens's form is the novel, after all. His plots, like his sentences, are forms of resurrection. All Dickens's great novels--from *Dombey and Son*, through *Bleak House* and *Little Dorrit*, to *Our Mutual Friend*--use multiple plots that resolve themselves, gradually, into one: characters are reborn under new names, or discover their true bloodline. Each individual plotline seems unrelated. But every novel turns out, in the end, to be a family romance. And this formal property possesses its artisanal double; the resurrections of Dickens's style--from *Dombey and Son* onward--were facilitated by his new way of working: to use folded sheets of paper, divided into sections, to plan out his novels in their serial parts and chapters. With this, he planned the ballet of his characters, the choreography of his plots.

Early in his career, in *Oliver Twist*, Dickens defended the novel as a place for steep transitions--like "all good murderous melodramas" where the comic and the tragic alternate, "as the layers of red and white in a side of streaky bacon." Some readers thought that this was overly dramatic, but for Dickens it was the structure of "real life." The difference was that in real life we did not notice the transitions "from well-spread boards to death-beds, and from mourning weeds to holiday garments," because "there, we are busy actors, instead of passive lookers-on." This principle of transition was the central method by which Dickens constructed a fiction. Like a morgue, it was a system that produced the irony of transition: the abrupt juxtaposition of the living and the dead.

It was a lesson, the reader discovers, that he would learn himself. (Life is so philistine in its exaggerated care for form!) On April 14, 1851, Dickens gave a speech to the General Theatrical Fund dinner, praising

the resilience of the actor who came "from scenes of affliction and misfortune--even from death itself--to play his part before us." And then Dickens left the dinner--and was told that his infant daughter, "with whom he had been happily playing just before leaving home," had died.

Life, as always, had a double plot. Later, when he was writing *Little Dorrit*, Dickens wrote a note to himself, wanting to intensify this way in which a plot could enact deaths and resurrections--a plot would be a structure to produce the parallels that would unify the vast city: "People to meet and part as travellers do, and the future connexion between them in the story, not to be now shewn to the reader but to be worked out as in real life. Try this uncertainty and this *not-putting of them* together, as a new means of interest."

In his essay "Dickens, Griffith and the Film Today," written in 1944, Sergei Eisenstein hailed Dickens and his use of the intercut double-plot as the ancestor of cinema--the inventor, in prose narrative, of montage. Montage, after all, depended on parallel action. "Griffith arrived at montage through the method of parallel action, and he was led to the idea of parallel action by--Dickens." Eisenstein went on to describe both "Griffith's montage exposition" and also "a montage progression of parallel scenes, intercut into each other." I admire this invocation of Dickens, alongside the early art of cinema; but it is important to see how Dickens's art of montage was more advanced than Eisenstein's. The idea of the parallel is everywhere in Dickens's notes. In August 1862, about to begin work on *Our Mutual Friend*, he remarked to Forster about his germinating idea of a structure: "bringing together two strongly contrasted places and two strongly contrasted sets of people with which and with whom the story is to rest, through the agency of an electric message."

An electric message! This is Dickens's description of a parallel, and its importance, I think, is this. The parallel allows a novel to become a whole force field, a living and expanding universe--an animating network of motifs--or, in his terms, a network of "shadowings." As he told Wilkie Collins--that other master of melodrama--a plot was an impersonation of fate: "I think the business of Art is to lay all that ground carefully, but with the care that conceals itself--to shew by a backward light, what everything has been working to--but only to SUGGEST, until the fulfilment comes. These are the ways of Providence--of which ways, all Art is but a little imitation."

Dickens, the novelist, impersonated Providence. This is another way of saying that he impersonated the city. It is the city, after all, where such fateful parallels happen with the densest rhythm. The city, as Eisenstein knew, is where montage was invented: "that head-spinning tempo of changing impressions with which Dickens sketches the city in the form of a dynamic (montage) picture." London was the capital of the nineteenth century, and its form was montage.

Dickens, it is true, used the montage form to prove that the rich could not separate themselves from the poor, to prove the "connexion" that existed "between many people in the innumerable histories of this world, who, from opposite sides of great gulfs, have, nevertheless, been very curiously brought together!" He was hysterically exercised by the way in which civilization could ignore the fact that it was barbaric. Before Walter Benjamin's famous late thesis on history--"there is no document of culture which is not at the same time a document of barbarism"--Dickens had already noted the inanimate animation. The urban graveyard at the center of the city, "with every villainy of life in action close on death, and every poisonous element of death in action close on life": "a shameful testimony to future ages, how civilization and barbarism walked this boastful island together."But this does not imply that Dickens had a coherent politics. In his essay, Eisenstein criticized the implications of Griffith's montage: "the structure that is reflected in the concept of Griffith's montage is the structure of bourgeois society.... And this society, perceived *only as a contrast between the haves and the have-nots*, is reflected in the consciousness of Griffith no deeper than the image of an intricate race between two parallel lines." Eisenstein, I assume, would have been similarly infuriated by Dickens. Dickens, after all, annoyed Brecht, and he dismayed

Lukács, who lamented "the limitations of Dickens's social criticism, his sometimes abstract-moral attitude towards concrete social-moral phenomena." But why must Dickens have a politics? He was a novelist. He had a style instead.

Dickens's politics was just a mode of feeling. He had been marked, after all, by one particular experience of living death--when he worked at a blacking factory off the Strand in 1824, when he had just turned twelve, and his family was almost bankrupt. Slater records the humiliating everyday detail: along with his partner, Bob Fagin (Fagin!), Dickens worked, with remarkable speed and dexterity, at the window--so remarkably, writes Slater, that passersby "used to stop to stare admiringly in at the window by which they worked." Dickens was transformed into a spectacle. And this experience comprehensively haunted him. Every time Dickens let his imagination become frivolous, the Blacking returned. At Christmas, the Dickens family played a parlor game in which everyone had to remember a sentence made up by the family, and add another phrase. According to his son Henry, "My father, after many turns, had successfully gone through the long string of words, and finished up with his own contribution, 'Warren's Blacking, 30, Strand!'"

A theory of the political in literature needs a theory of feeling: this is a conclusion that may be drawn from the life, and the biography, of Dickens. A theory of junk needs a corresponding theory of the sentimental. The sentimental, after all, is just the junk of feeling, its hollow repetition. Dickens often described himself having "a real good cry" when he wrote. Such outbursts were constant. On April 21, 1849, writing in *The Examiner*, Dickens quoted from an inquiry into a recent scandalous case of children who had died of cholera in a baby farm. When the scandal was uncovered, the surviving children had been taken to the Royal Free Hospital--where the nurses fed them milk and bread. And, Dickens reported, there was a child who could not eat: "No; he held up his hand, and said, 'Oh, nurse, what a big bit of bread this is!'"--"a little touch," added the writer, "of a peculiarly affecting kind, such as the masters of pathos have rarely excelled in fiction."

The masters of pathos: there is real admiration in that phrase. Dickens was not at all embarrassed by the sentimental. And yet he was also an expert in compassion, which was not fake. He institutes the modernist examination of fake and true feeling: what is live and what is not. "I should not like to hear the charge of sentimentality made against this strain that runs through *Bleak House,*" observed Nabokov rightly, at his lectern, in his *Lectures on Literature*. "I want to submit that people who denounce the sentimental are generally unaware of what sentiment is." And he added: "Dickens's great art should not be mistaken for a cockney version of the seat of emotion--it is the real thing, keen, subtle, specialized compassion."

The compassion is there most decisively in Dickens's generous precision to minor characters. Like, say, Mrs. Piper, who comes to the Sol's Arms in order to present her minor evidence at an inquest:

Mrs. Piper lives in the court (which her husband is a cabinet-maker), and it has long been well beknown among the neighbours (counting from the day next but one before the half-baptizing of Alexander James Piper aged eighteen months and four days old on accounts of not being expected to live such was the sufferings gentlemen of that child in his gums) as the Plaintive--so Mrs. Piper insists on calling the deceased--was reported to have sold himself.Mrs. Piper is just a flicker in that vast electric network that Dickens called *Bleak House*--and she is permanent. With Mrs. Piper, the reader comes upon the center of Dickens's life-giving style, in the care lavished so quickly on lesser figures. For there is also truth in cliché, in the way a self freezes into its gestures. In the end, the self can be content with very little--like a cabman who is given twopence, which he receives "with anything but transport, tosses the money into the air, catches it over-handed, and retires." Nabokov commented: "this gesture, this one gesture, with its epithet 'over-handed'--a trifle--but the man is alive forever in a good reader's mind." And then he added: "A great writer's world is indeed a magic democracy where even some very minor character ... has the right to live and breed." This, in the end, is the flimsy, ethereal, convincing politics of Dickens's prose: not in his speeches, or his newspaper campaigns, but in the democracy of his fiction, in its massive crowd of animate extras.

IV.

The medium in which these minor characters lived was the mixing and refining solution of Dickens's voice. Among all the Dickensian system of repetitions, the most repeated element is Dickens himself: his prose style. At his audience with Queen Victoria in 1870, he may have commiserated sedately over "the price of butchers' meat, and bread," but he was really a revolution of one. And the key to this revolution, to this style, may be found in his performances.

Around 1843, when he was writing *A Christmas Carol*, Dickens changed the way he wrote. He developed a more performative system of punctuation: a musical notation of semicolons. And it was also in *A Christmas Carol* that Dickens allowed his prose to become an electric message between the novelist and the absent reader: "Scrooge, starting up into a half-recumbent attitude, found himself face to face with the unearthly visitor who drew them: as close to it as I am now to you, and I am standing in the spirit at your elbow." When he came to give his famous performed readings, he chose to begin with *A Christmas Carol*--but he cut that passage, because at last there was no need to remind the absent reader of the absent novelist's presence.

Before he became a novelist, Dickens had considered becoming an actor. With his assiduous precision, he had practiced "even such things as walking in and out, and sitting down in a chair." His hero was Charles Matthews, who would come on stage as himself, in evening dress--and then play all the parts, culminating in a final bravura "monopolylogue." It was an early form of stand-up. And this solo performance of multiple imitations formed the nucleus of Dickens's style: a new form of prose, based on mimicry.

Mimicry, of course, is based on an idea of the human as repetition. "How easily peculiarities may be acquired by negligence," observed Matthews, "and how difficult they are to eradicate when strengthened by habit." Dickens made this offhand observation central to the art of the novel: a sustained analysis of how far the repetitive is the essence of a character, or the appropriation of a self by the other. Dickens is the great comic impersonator. In the vocabulary of the nineteenth century, he is the great assumer. He impersonated other people, and he impersonated himself. This is why his biography is of such prickly and absorbing interest. He performed his own multiple imagination.

He wanted to be ghostly. He liked the idea of the novelist as ghost--as in his idea of an editing persona for his magazine, *Household Words*: "I want to suppose a certain SHADOW ... a kind of semi-omniscient, omnipresent, intangible creature" which would "loom as a fanciful thing all over London ... a sort of previously unthought of Power going about." But this was simply a way of describing his infinite vampiric style. And the main subject he haunted was himself. This was the secret he imparted to a Russian admirer, another genius of "good murderous melodramas," who came to interview him in the summer of 1862. Dostoevsky, who was not yet the author of *Crime and Punishment* or *Demons* or any of his major novels, later recounted Dickens's theory:

There were two people in him, he told me: one who feels as he ought to feel and one who feels the opposite. From the one who feels the opposite I make my evil characters, from the one who feels as a man ought to feel I try to live my life. Only two people? I asked.Toward the end of his life, Dickens decided to add to his repertory of readings the murder of Nancy by her lover Bill Sikes in *Oliver Twist*. In performance, he continued to create the tale, to embellish the novel, adding extra detail--such as Sikes's dog, his paws bloodstained, "crawling as if those stains had poisoned him!!" Famously, his enactment of the guilty murderer made Dickens feel like a murderer: he wrote to the painter Frith in November 1868 that his acting was "horribly like, I am afraid"--"I have a vague sense of being 'wanted' as I walk about the streets." A short while earlier, in April 1867, Dickens had written to his friend Robert Lytton that with his performed readings, with "this interpretation of myself (then quite strange in the public ear)," he had hoped to hint at "some new expression of the meaning of my books." The new meaning, I think, was simple. It was the living proof that Dickens--with gas jets rigged up to shine brightly on his face, because he was, after all, the flaneur of gaslight--had invented the narrator as impersonator.

From Paris, on May 16, 1863, Dickens published an essay in his magazine *Household Words*. His essay featured the Paris morgue. In particular, it noted the variety of expressions adopted by the tourists when looking at the corpses (adopted by the flaneur, looking at the world):

there was a wolfish stare at the object.... And there was a much more general, purposeless, vacant staring at it--like looking at waxwork, without a catalogue, and not knowing what to make of it. But all these expressions concurred in possessing the one underlying expression of *looking at something that could not return a look.*

The Paris morgue was the hidden, concentrated form of London--of life. In the horrified italics of this asymmetrical looking, where the world is observed in the form of a waxwork, the disturbed energy of Dickens's art and life may be found. So horrified by the inanimate, by the world's junk, Dickens gave himself the infinite task of quickening everything, of impersonating everything--a demiurgic task of animation, through the precarious immortality of art.

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http://www.tnr.com/article/books-and-arts/the-animator

The Ideal and the Real

- Moshe Halbertal
- December 12, 2009 | 12:00 am

The Idea of Justice

By Amartya Sen

(Harvard University Press, 467 pp., $29.95)

In his introduction to *The Idea of Justice*, Amartya Sen asks the reader to imagine a scenario that will figure prominently throughout the book. Three children are arguing among themselves about which one of them should have a flute. The first child, Anne, is a trained musician who can make the best use of the flute. The second child, Bob, is the poorest of the three and owns no other toys or instruments. Clara, the third contender, happens to be the one who, with hard sustained labor, made the flute. Since philosophers try to reason about such distributive problems, each of the children can enlist support from a grand theory of justice that originated in what seems to be an impartial position in moral philosophy.

Utilitarians will opt for giving the flute to Anne, since their criteria for distribution is to give preference to the scheme that will maximize overall utility, thus granting the instrument to the individual who can derive the most pleasure out of it. Bob, the poorest child among the three, will be chosen by egalitarians, since the main concern of their distributive approach is to narrow social and economic gaps as much as possible. And libertarians, who emphasize rights-based ownership entitlements, will claim that Clara deserves the flute as the producer of the object, and that no other distributive concerns--egalitarian or utilitarian--can supersede her entitlement to what she naturally owns.

Since the publication of John Rawls's monumental book *A Theory of Justice* in 1971, such grand theories of distributive justice have gained momentum and depth. Rawls himself defended an egalitarian position. He articulated it in his famous difference principle, according to which deviations from strict equality

may be allowed only if such deviations will work for the benefit of the worst-off. According to Rawls, perfect equality should have been the rule, but rewarding capable people with differential income will create an incentive for them to raise the production of the sum total of goods, which in a system of fair distribution might end up benefiting the people who are at the bottom of the economic ladder.

The ultimate merit of Rawls's work did not lie only in his own theory, but in the extraordinarily broad discussion that it generated. Rawls's work provided a framework for a flurry of counter-theories, such as G.A. Cohen's in *Rescuing Justice and Equality*, which challenged Rawls from the left and advocated a stricter egalitarianism; and Robert Nozick's sophisticated libertarian response in *Anarchy, State, and Utopia*; and Michael Walzer's development, in *Spheres of Justice*, of a communitarian approach to the problem. Now comes Sen's magnificent book, which is dedicated to Rawls's memory, but differs dramatically from the Rawlsian and post-Rawlsian conversations.

Sen rejects, as a matter of principle, the nature of Rawls's project. The reader who seeks in this book yet another exercise in grand theory--another abstract discussion out of which the foundations for the institutions of a just society may be generated--will be disappointed. And the reader who wonders about the connection of all these abstractions about justice to the remedying of actually existing injustices will be glad. Sen questions the plausibility of such edifices of pure reason. His book quite radically attempts to shift the grounds of the conversation altogether. Its seeks to provide a counter-framework rather than a counter-theory. And this is only one of its many admirable ambitions.

According to Sen, a sustained and reasoned argument about justice should focus on a result-oriented comparative approach among different conditions, rather than on an attempt to formulate the philosophical conditions of a perfectly just society. We can confidently claim that a society that rejects slavery is more just than a society that endorses slavery. And such a sound comparison can be performed without actually having a clear-cut notion of what a perfectly just society would be like. Injustices are altogether easier to identify than the conditions of perfect justice. And injustices can be identified on the basis of various and competing grand theories, which may overlap in such actual comparative judgments. As Sen observes, we can assess whether a painting by Dalí is better than a painting by Picasso without making the claim that the *Mona Lisa* is the best or the most ideal painting of all. Constituting a perfect standard is not a necessary condition for the comparative work that has to be done in removing injustices. Nor is it a sufficient condition: we might have a clear conception of the perfectly just society and still find it difficult, or even impossible, to evaluate two options, two courses of action, that present themselves in real life. Each of these options, which will never be fully perfect, might be closer to perfection according to a different variable they each have.

Given the fact that having a perfect conception of the just society is neither necessary nor sufficient for the actual comparative judgments that are needed in real life, Sen concludes that such a project is quite redundant. To the redundancy argument he adds a deeper and philosophically more interesting argument for rejecting the very notion of the theory of justice. He argues that such an attempt is not feasible. Consider again that debate between the three children about the flute. According to Sen, each child makes a persuasive claim, and each of the grand theories that support such claims--utilitarian, egalitarian, libertarian--can withstand impartial scrutiny, and therefore each of them is right. There simply is no way to adjudicate between the rival grand theories that support different distributive schemes.

There is genuine humility in recognizing the intrinsic limits of our reasoning and the essential pluralism of value. Sen's conceptual sophistication is in the service of a rare intellectual modesty. Still, we must distinguish between two different interpretations of the rejection of the grand theory of justice, only one of which seems to me defensible. Sen, at different moments of his argument, asserts that indeed each of the proposed grand theories is right and has a strong case, and that we should therefore avoid the business of arguing about--and attempting to establish--perfect justice, because perfection can legitimately come in a variety of radically different forms. I think that such a view is implausible. There are some good

arguments for rejecting libertarianism, and some of them are made by Sen in his book, and also in his previous works.

Imagine a slight shift in the parable of the three children. Let us assume that what is at stake for distribution is not a flute but a rare medicine that Clara, the brilliant and productive child, somehow managed to invent. She is willing to provide the medicine to Anne, who is very sick, but only for an outrageous compensation. If she does not get her coveted price, then Anne will die; and nobody--this is the libertarian claim--can take the medicine away from her, since she has ownership rights as a producer. In such a story, it seems clear that sticking solely to the libertarian approach to ownership rights, regardless of the outcome, is wrong. Even if we assert that there are such rights, surely they should not be absolute.

A serious argument can be made as well against the other grand theory--utilitarianism, the one that would have awarded the contested flute to the child who would get the most use out of it. In its sole interest in outcomes, utilitarianism tends to erase the individuality of people, as Rawls pointed out. In order to highlight this problematic feature of utilitarianism, let us once again alter the circumstances, and therefore the distributive stakes, of our parable. Let us assume that Clara needs a liver transplant and Anne a heart transplant to survive. From a strict utilitarian perspective, as a matter of principle, there is a justification for removing Bob's heart and liver. (Assume for the sake of argument that Anne's heart or Clara's liver cannot be used for transplants.) But such a violation of Bob's rights to the integrity of his body seems intuitively wrong. Moreover, the egalitarian approach is also vulnerable to serious criticism. If Clara is the only producer among the children, and everything that she produces is given by the egalitarian to the deprived child Bob, so as to minimize the social gaps, we can expect that Clara will stop producing altogether. And that will end up harming Bob, among others. (Rawls was himself concerned about this consequence.)

So it should be possible to state, and interpret, Sen's argument in a slightly different and sharper way. The problem with grand theories of justice, we might say, is not that each of them is, in its own way, right, but that by aspiring to grandness and exclusivity they are, all of them, wrong. The very attempt to produce a total and ultimate theory for a perfectly just society will inevitably generate injustice. This is the reason why Sen, after realizing the limitations of each grand theory, wisely resists any temptation to produce one of his own.

Following Sen, when we examine different grand theories we realize that each of them has a point, that there is an aspect--but no more than an aspect--of their respective claims that is convincing. Grand theories become perverse when they postulate themselves as exclusive, when they wish to solve all the complex issues with one decisive and final principle. Rights-based libertarians have a point, but their complete disregard of outcomes makes their position flawed. Utilitarians make an important contribution to the conversation, but their exclusive interest in outcomes is wrong. Egalitarians are deeply attractive for the principle that moves them, but their principle cannot withstand critical scrutiny when it is the only principle of justice there is.

The best way of making comparative judgments is by considering multiple points of view as they are refined by different theories, and weighing the diverse claims that they make. By rejecting an ultimate theory of justice, we do not paralyze ourselves, or surrender our intention to improve the world. Quite the contrary. We liberate ourselves for the full complexity of the challenge before us, and equip ourselves with all the elements of comparative reasoning that the evaluation of an injustice requires. Only when philosophy is deployed in this patient and pluralistic way can we apply it usefully to real people and real conditions.

It is important to note also that Sen's acceptance of the limited and relative force of each grand theory does not deteriorate into any kind of moral relativism. Pluralism is not relativism. Choosing between different approaches and policies is not an expression of taste or prejudice, a purely subjective effusion of

passion. Such choice has a more general and objective and rational ground. In Sen's view, truth may be secured intellectually without our being in control of a single absolute criterion. In this connection, he develops one of the deepest ideas of his book--the notion that he calls positional objectivity.

Objectivity, Sen insists, is not omniscience, or a God's-eye view of things, or a view from nowhere. After all, we are always somewhere, in a specific position, with particular constrictions of perception and understanding. Yet we still can mentally correct for the limitations of our cognitive situation and make a rational judgment in choosing a policy and opting between alternatives. We do this--we arrive at objectivity--by means of a thorough examination of diverse points of view. This is also the procedure of democracy, which Sen likes to call government by discussion. In a true democracy, we are open to ideas and methods that originate outside our own cultural and political traditions. It is through such an examination of the relative weight of different arguments that we can approach a consensus about the truth of a matter, without claiming to possess any perfect or ideal or absolute standard.

Sen makes a powerful argument for adopting a particular standard in ranking and comparing the various approaches to proposed policies or states of affairs. In making such assessments, he says, we should consider the standard of capabilities, and their distribution across a society. By capabilities, he means the actual effective power that people have to develop their human potential and to act in the world. Such a scale measures relative conditions such as health, literacy, and freedom, which all combine together to measure the relative condition of people for the fulfillment of themselves and their community. In measuring capabilities, we must understand that sometimes the broadening of agency and effectiveness may bring about a decline in happiness. Deprived people with no choice might be happy about their condition, since happiness is often a function of limited expectations; and with rising expectations comes the revolution that bears their name, and also the possibility of disappointment and defeat. And yet, Sen insists, we should opt for agency and freedom rather than for sheer happiness.

In his emphasis on capabilities, Sen rejects two other measures of the condition of individual agency: income and well-being. Income is too narrow a criterion, since the capacity to convert income into actual freedoms and possibilities differs between people of similar means. If someone is limited by an illness or a handicap, his capacity to make use of a certain income will be very different from that of a healthier person. According to Sen, we should also avoid using well-being--which is very commonly supported among economists who deal with social choice--as a criterion for our approach to justice. The adoption of welfare, well-being, or happiness as the standard is based on an assumption that people are self-interested creatures who seek the fulfillment of their desires, and that the rational approach to assessing a social situation is measuring to what degree it offers maximization of self-interest. Well-being, in other words, is just a softer name for self-interest and egotistical harshness.

The repudiation of the economicist account of life is one of this book's most valuable achievements. People seek not only their own well-being but also the well-being of others, and often they are willing to make sacrifices so that others will benefit. In measuring their situation, therefore, we should consider also the degree to which they have the capability to contribute to others. Theorists who support the self-interest picture of "economic man" claim that this kind of altruism is actually reducible to egoism. In this economic view, people seek the good of others because it will make them happy. There is no essential difference between an altruist and an egotist--they both wish the fulfillment of their desires, but the altruist happens to have a desire that benefits others.

Such an argument is a reversal of the actual causal order. People do not seek the good of others because it will first make them happy. They are happy as a result of the help, the happiness, that they give to others: they wish to help for its own sake. The gratification that they receive from helping is hardly the primary reason for their help. Even more, Sen argues, the very capability and power to affect the lives of others for the better is the source of our moral obligation.

The spectacle of an economist rejecting a purely economic understanding of the individual is delightful to behold. And this wise and deep position--focusing on a comparative, results-oriented approach, which is measured by the actual capabilities that it offers human beings--is not based on Sen's arguments alone,

important and penetrating as they are. His position expresses also a larger sensibility that is anchored in his exceptional range of thought and his lifelong commitments. Besides what he describes as his love affair with philosophy, he is a world-renowned economist and one of the greatest public intellectuals of India, who has been a leading voice for social and economic reforms, breaking new ground in the analysis of gender inequality, famine, and illiteracy.

Sen's range is amazing. His intimacy with the Hindu, Buddhist, and Muslim cultures of India, which is beautifully woven into the book, gives him access to a far greater range of argumentation and reasoning than is common among philosophers who were educated exclusively in the Western analytical tradition. His knowledge of this vast cultural history, and his profound respect for it, is an important source of Sen's humility in recognizing the essential plurality of legitimate claims--in rejecting any sort of monism in the life of the mind.

This larger scope, I should add, enables Sen to teach--by example: he is not a preacher of any kind--a more nuanced sense of the complexity and the richness of Eastern and Islamic cultures. Though Sen is steeped in other traditions (some of which are, of course, his own traditions), his syncretism carries no threat of a clash of civilizations. Nor does it propound any kind of superficial harmony. Instead his work--in its simultaneous affirmation of the universal and the particular--serves as an eloquent and humane testimony to the power of reason, which respects (when it is honest and attends to the integrity of its arguments) the multiplicity of voices and traditions. Reason seeks truth wherever it may be found, and so, like the author of this genuinely important book, it travels widely, and may find support near and far.

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Making His Way

- Stanley Kauffmann
- December 11, 2009 | 12:00 am

The Sun

Lorber Films

The Wedding Song

Strand Releasing

Act of God

Zeitgeist Films

The pace is adagio, the temper contemplative, so it is all the more surprising that the subject is Emperor Hirohito of Japan during the brief period between Hiroshima and surrender. *The Sun* was made by the Russian director Alexander Sokurov, who is noted, among other reasons, for the slow tempo of his films. Except for his feature-length careering through the Hermitage in St. Petersburg (*Russian Ark*), he has often chosen to meditate on shots, making that meditation part of the picture's progress. *The Sun* is quite different. This film never consciously pauses in the former Sokurov style, yet the atmosphere in which the action occurs seems contrapuntally thoughtful.

With a screenplay by Yuri Arabov, the film is unique immediately because it deals with human divinity. Though Hirohito often says that he has a body like everyone else, and though we see the dailiness of his life, to his staff, and to the people of Japan, he is descended from the sun and is a god. So his divine being requires the deliberate rhythm of the film: it could hardly hurry. Obliquely, the way that he is regarded is a reminder that the fury of the Japanese armed forces in World War II had its base in religious fervor unknown elsewhere. The idolized Hitler was a familiar figure to his zealots; Hirohito, though sometimes seen by the Japanese, was never even actually heard by them until the end of the war.

Sokurov explores the behavior of a god after his country is atom-bombed, as defeat closes in. For a brief time Hirohito maintains both his mortality and his godhead. At the start of the picture, he is awakened and dressed, is told his agenda for the day. It includes all aspects of his being. He attends a military meeting and tells some opposing generals that he doesn't want the war pursued. (After he leaves they continue to argue.) Then the other Hirohito visits a marine biology lab and investigates a crab--this lab is a favorite of his. Then he writes to his son and looks through family photo albums. He even has an album of Hollywood stars, though he says later that he doesn't care for cinema. The day ticks on and on. We see an individual trapped between tradition and reality, not to draw sympathy from us but a sense of fate growling at the gate of past centuries.

Though he dreams later of Hiroshima, though he sees some bomb damage in Tokyo from his limousine, it is only after General MacArthur is established in Tokyo that the texture of Hirohito's life begins to change. MacArthur invites him to call, instead of calling on him. Hirohito accepts, knowing what acceptance means. (They converse in English: Hirohito knows several languages.) When the emperor leaves, MacArthur remains seated, and no staff member is on hand to open the door. This is the only time that we see the emperor open a door for himself. Later MacArthur invites him to dinner, just the two of them; smokes a cigar with him; and then sends him a box of Hershey bars.

MacArthur, we feel, is moving cagily. He wants to bring the divinity down to earth at the same time that he doesn't want to anger the Japanese people. The schism seems fused when at last the emperor-god speaks on the radio--the first time that his people have heard him--to declare an end to the war and to renounce his divinity. He then agrees to be photographed, and when he appears in front of the palace, unattended, in a suit and homburg, the U.S. Army photographers don't at first realize that he is the emperor.

The fascination of this film is not only that all its contradictions are true but that we see an immense historical change embodied in one slight figure. Issey Ogata, who plays Hirohito, creates a man who, versed in the world, understands the pathos of his power. Sokurov, whose own country has had its sanguine encounters with Japan, helps Ogata to step out of the chronicles into rueful oddity. The film has some curious lip-synching at times--inexplicable because the Japanese actors speak their own language. Nonetheless, *The Sun* is clearly the work of a director with exceptional curiosities and resources.

There has been no shortage of films from the Middle East about emotional attachment between a Jew and a Muslim, usually a man and a woman. In *The Wedding Song* the attachment is between two nubile girls--not lesbian, simply sisterly love--and the place is an Arab city, Tunis, during the German occupation in 1942. Written by its director, Karin Albou, who also plays a major role, *The Wedding Song* explores the contrasts and conflicts we might expect, and it illuminates them all, but it also opens an even larger matter.

At the start Arab children actually do sing a wedding song that recurs throughout the picture--sometimes apt, sometimes sadly not. Then we see a belly dancer who is part of the engagement party for two Muslim cousins, Khaled and Nour. The latter lives across a courtyard from Myriam, her dear Jewish friend. Myriam is not engaged, but her mother, played by Albou, is trying to alter that. The war hastens her. The Allies have bombed Tunis--we see and hear some of the raid--and the authorities have levied a heavy fine on the Jews of Tunis to pay for the damage. (Since the entire war was craftily engineered by Jews, say the authorities, the Jews of Tunis should pay for the havoc that other Jews caused.) Myriam's mother wants her to marry a wealthy Jewish doctor, an older man, who can help with her share of the city's fine.

The double story plays itself out in cultural contrasts between its two strands, with somewhat more attention to Nour because she wants to be with her fiancé and Myriam doesn't even like her proposed fiancé. We see some Muslim practices and attitudes toward women (including an explicit scene in which a bride-to-be has her pubic hair removed so that she will have a satin skin for her groom). Khaled and Nour are themselves too impatient to wait until marriage for sex, which leads to a wedding-night trick. Nour is supposed to be deflowered that night. Khaled nicks her ankle with a knife and stains a sheet, which is then passed out the door to a group of waiting women who sing and celebrate.

Myriam's story is otherwise settled. But engaging as the two stories are, including their quarrels and reconciliations, what Albou has essentially and embracingly evoked here is a suffusing atmosphere of femaleness. Males abound in the film, but the communion of women prevails. The very scent in the air is of the beings of women, physical, emotional, unarticulated but understood.

From the opening belly dance through the depilation to the marital maneuverings of Myriam's mother, we move in a world where men seem both the raison d'être of the stories and intruders. Albou keeps the camera so close to female faces so much of the time that we are enclosed in a wave of gender. The cinematographer, Laurent Brunet, tints many shots with a hint of blue that deepens the intimacy.

Olympe Borval plays Nour with understanding and heat. Lizzie Brocheré is even more skilled as Myriam. Albou herself, as Myriam's mother, has strength and presence. They and all the others negotiate the turns and crannies of the stories with conviction, but ultimately what we are left with is the aura of femininity.

One invaluable function of the documentary is to reveal the interest in commonplaces. Such a film was a German documentary about dust last year. *Act of God* is a documentary about lightning by Jennifer Baichwal. I have myself been keen on the subject of lightning ever since I was fifteen, when I had a summer job on a dairy farm in upstate New York. After a severe thunderstorm one night, I went up the hill next morning to get the cows for milking and found one of them prone and, seemingly, inflated. She had been struck by lightning. Her hide was untouched, but it was as if she had been made of rubber and had been blown up. The stroke had in fact incinerated her insides.

Lightning always reminds me of that cow, of chance as fact. Baichwal's film underscores this view. She investigates lightning strikes and the lightning-struck--and those who have witnessed the phenomenon. The film is bookended by the novelist Paul Auster. He says at the beginning that when he was fourteen, at a summer camp, he and some other boys were trapped in a severe storm. The film finishes with Auster telling us that a boy who was only a few feet from him was killed, that it was only a few seconds' movement that took the other boy and not him. The randomness, the happenstance, the sense of space as possible enemy are the subjects of the intervening film.

Baichwal has traveled for her material-all of which, though anyone's chance of being hit is only one out of 700,000, is sobering. In France we visit a museum of objects that have been struck by lightning. In Las Vegas we meet a man who was struck by lightning, was severely injured, recovered, and became a spiritualist teacher. In Cuba there is a group, descended from Africans, who see lightning as an African god from an earlier religion who still has the power to vent his anger below. In Mexico we meet survivors of a lightning storm that killed several children gathered around a gigantic cross on top of a hill. (We later see the cross being taken down and moved away. This shot may not have been meant to have implications, but it can't escape them.)

Inevitably there are many shots of lightning flashes, but more startling are the shots of stormy skies. Views of the sky in films are usually sunny--sunrise, sunsets, etc. Stormy skies have an entirely different character--almost like beautiful warnings. In any case, Baichwal's film brings us safely close to a danger that, as I happen to know, we never think about until it strikes somewhere, as it always can.

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http://www.tnr.com/article/metro-policy/making-his-way

Our Bauhaus

- Jed Perl
- December 10, 2009 | 12:00 am

Bauhaus 1919–1933: Workshops for Modernity

Museum of Modern Art

Kandinsky

Guggenheim Museum

This is an autumn of anniversaries in two of New York's most important museums. At the Museum of Modern Art, "Bauhaus 1919–1933: Workshops for Modernity," the exhibition saluting the ninetieth anniversary of the opening of the legendary German school of art, architecture, and design, also marks the eightieth anniversary of the founding of the Modern. Up north and to the east, the Guggenheim is capping the celebrations of the fiftieth anniversary of Frank Lloyd Wright's still astonishingly audacious building, now freshly restored, with a stirring retrospective of paintings by Vasily Kandinsky, whose work was at the core of the Guggenheim's mission when it opened its doors as the Museum of Non-Objective Painting on East 54th Street seventy years ago. The year 1939 was also highly significant in the history of the Museum of Modern Art: it was in November of that year, mere months after mounting a pioneering Bauhaus show late in 1938, that the museum unveiled its very own new building on West 53rd Street, a structure whose spare lines were closely related to the vision of a new architecture that had been promoted at the Bauhaus.

To recite these neat round numbers is to be reminded of the almost boundless excitement about modern art that animated some New Yorkers--and some Americans--in the second quarter of the twentieth century. I sense in this fall's heartfelt salutes to Kandinsky and to the extraordinary personalities in the fourteen-year history of the Bauhaus, where Kandinsky taught, a re-affirmation of that old modern, or modernist, enthusiasm. Under the directorship of Richard Armstrong, the Guggenheim has a chance of awakening from the nightmare of the Thomas Krens years, and the Kandinsky show has inspired an extraordinary response, with crowds lined up around the block to see the work of one of the most uncompromising, hell-bent, and, sometimes, inscrutable of all the masters of modern art. And I have a hunch that "Bauhaus 1919–1933: Workshops for Modernity" is going to be that most glorious and rare of museum events, a blockbuster with brains. The Modern, which has made more than its fair share of missteps in recent years, has this time around done itself proud. The curators involved are Barry Bergdoll, chief curator of architecture and design, and Leah Dickerman, a curator in the department of painting and sculpture. They are impressive scholars who treat the variegated products of the Bauhaus, which range

from lamps and coffee pots to paintings, as part of the historical record *and* as works with a freestanding value. This supercharged exhibition is about nothing less than the triumphs and tribulations of modernity.

Consider for a moment the year 1919, when the Bauhaus opened its doors in Weimar. The very mention of that year (and of that city) sends a chill down the spine. A hideous war had ended. Europeans at last had reason to hope. But in retrospect we can see that the cataclysms that enveloped the continent only twenty years later were already set in motion. To return to the art of Kandinsky and to the history of the Bauhaus is to feel, once again, both the promises and the disappointments of those years, and how confoundingly they were sometimes intermingled. Progressive-minded artists, whether Marxist or not, were following the Soviet experiment, which was at first apparently friendly to the avant-garde--Kandinsky experienced it at first hand, living in Russia from 1914 to 1921, when he obtained an appointment to teach at the Bauhaus. Arriving at the Bauhaus, a state-supported school in a country whose new democratic institutions were always threatened by the forces of reaction, Kandinsky found himself amid a group of creative spirits, invariably the products of bourgeois society, who sought, individually and collectively, to revise the nature of that society.At the Bauhaus, teachers and students talked and argued about everything--brilliantly, expansively. What was the place of artisanal production in an increasingly technological society? Were the arts a matter of individual expression? Would a new, more egalitarian society require a new, more egalitarian--and perhaps more impersonal--art? And until that new society became a reality, could radically new forms of expression be reconciled with capitalist methods of production? To these questions they offered many answers, most often in the form of actual objects and works of art, nearly all of them outrageously lovely, some of them indisputable masterworks, which now fill the galleries on the sixth floor of the Museum of Modern Art. Certainly, the Bauhaus had its fair share of ideologues, among them Walter Gropius, the architect who was director from 1919 to 1928, and wanted to create a new unity of the arts. But the truth was that there could never be any definitive answer, any ultimate Bauhaus faith: that was part of the school's greatness. And then Hitler came to power, and the questions could no longer be asked openly, at least not in Germany.

New York--indeed, America--had nothing to do with the formation of Kandinsky's art, and next to nothing to do with the dream of re-imagining the visual world that animated the Bauhaus. And yet in New York now, at a time when artistic expression seems more than ever at the mercy of impersonal technological forces, the questions that these men and women asked several lifetimes ago seem fresh, pointed, essential. In part this is because so many of the key figures at the Bauhaus ended up in America, including Gropius, Herbert Bayer, László Moholy-Nagy, Marcel Breuer, Ludwig Mies van der Rohe, and Josef and Anni Albers. In America, the alumni of the Bauhaus, the teachers and the students, were formidable émigré presences, romantic optimists who to one degree or another had been mugged by reality. On American soil they picked themselves up and became preoccupied with new versions of the same questions about the relation between artistic innovation and industrial production, and the place of the individual in bourgeois society. Their impact on many aspects of America, from the art of the avant-garde to Madison Avenue ad campaigns and the postwar skyscraper style, was incalculable.If a Bauhaus show now seems like the most natural thing in the world-certainly the most natural show to encounter at the Museum of Modern Art--it is to some extent because the Modern long ago waged the fight for the acceptance of tubular metal furniture, sans-serif type, geometric carpets, and paintings by Klee and Kandinsky. From *Good Old Modern*, Russell Lynes's history of the museum, I learn that New York did not exactly embrace the Bauhaus show of 1938 with open arms. Lynes quotes the newspaper attacks on the exhibition: "confusing, and still worse … gadgety," "clumsily installed," "little short of a fiasco," "chaotic." One reviewer found "something essentially heavy, forced and repellent in most of the Bauhaus work." Yet Alfred H. Barr Jr., the museum's founding director, would not be deterred. He had spent a few days at the Bauhaus two years before the museum opened, and there he discovered a vision of the unity of the modern arts that would influence the shape of the Modern, which promoted not only painting and sculpture but also photography, architecture, and design. The exhibitions of inexpensive, well-designed household objects that the museum inaugurated in the late 1930s, although sometimes criticized as a capitulation to market forces, were in fact Barr's admiring response to the old Bauhaus project of bringing modern taste to the masses.

The revolutionary dreams of the Bauhaus became our everyday realities, and in some cases our everyday banalities. And the two great shows being presented at the Museum of Modern Art and the Guggenheim Museum this fall allow us to go back and figure out what went wrong--how the glorious promise of the Bauhaus became so terribly tarnished, and in so many respects misunderstood. Is it possible to go back to the future? I am not sure. But the other day, as I stood at the top of the ramp at the Guggenheim, it really seemed like a possibility. Just above my head was Frank Lloyd Wright's skylight dome, at once extravagant and austere, the work of a man who had deeply impressed many European architects, including Gropius, and had in turn been affected by their work (although he denied it). Looking across the rotunda, I could take in the unfolding spectacle of Kandinsky's late paintings, in which his perfervid romanticism had cooled to a Mozartean classicism--witty, delicate, lyrical, Olympian. Standing there, near the summit of the great spiral, I did believe that the old modern hopes could be hoped once again.

The Bauhaus show opens thunderously, with a cry of optimism. It is Johannes Itten's almost eight-foot-high *Ascent and Resting Point*, a cacophonous, visionary abstraction--a fantastical cathedral made of rising circles and triangles in hot, strident colors. And the exhibition's end is pianissimo, with five magnificent works by Paul Klee, ranging from the impassioned geometry of *Fire in the Evening* and *Highway and Byroads* to the mystical geology of *Castle Garden* and the tragicomedy of *Mask of Fear*. In between, a museumgoer is engaged by a bewildering array of objects and works of art, somehow gathered together so as to create an entirely convincing whole. Anybody who loves the decorative and graphic arts cannot fail to be entranced by this gathering of modern delights, which includes the sometimes fantastically shaped pottery pitchers produced in the early years in Weimar, the intricately woven hangings of Gunta Stölzl and Anni Albers, the precipitously asymmetrical designs for posters and books and magazine covers by Bayer and Moholy-Nagy, and Breuer's sleek, tubular metal furniture. There are architectural models, photographs, set designs, children's toys and furniture, ashtrays, fabrics, wallpapers, chess sets, and much, much more.

This deliciously heterogeneous display is held together by Bergdoll and Dickerman's sure sense of historical development and social dynamics. This is the first show that the Museum of Modern Art has devoted to the Bauhaus since 1938, when what was presented, we are now told, was a fairly distorted view of the evolution of the school. Organized by Gropius, who was then teaching at Harvard, and installed by Bayer, who also designed the influential catalogue, the 1938 exhibition entirely omitted the final five years of the Bauhaus, after Gropius had left, and also downplayed the early years in Weimar, when the influence of the painter Johannes Itten was strongest, and the orientation was more artisanal and perhaps mystical, with links to the spirit of the Arts and Crafts movement of the nineteenth century. What dominated at the Modern in 1938 was Gropius's vision of a school where individual expression was subsumed in the creation of a new visual order, what he called "a new and powerful correlation of all the processes of creation."

"Bauhaus 1919–1933: Workshops for Modernity" refocuses the story, conveying an especially strong sense of shifting goals and diverse personalities. The building that Gropius designed for the Dessau Bauhaus in 1927--represented at the Modern by a beautiful model of the striking, meandering structure, with its interlocking wings--is generally seen as the heart and soul of the institution. But here Gropius's Dessau building turns out to be only one element in a complex evolution. Bergdoll and Dickerman wish to emphasize the fluidity of the Bauhaus. In their telling, the fundamental courses dedicated to general principles of design, which influenced generations of art educators in the United States, seem less important than the intense activity in workshops devoted to weaving or metalwork, so that we have a sense of the Bauhaus as somewhat decentralized, composed of a number of overlapping force fields. Diversity, not unity, is the keynote in this brilliant new portrait of an institution that was for more than a decade regarded by many as the mecca of modernism.

A lifetime--certainly a good deal more than fourteen years--seems to separate the folkloric earthiness of the early Weimar years of the Bauhaus as seen at the Museum of Modern Art from the arctic cool of some

of the later displays. In the beginning there is a mood of barbaric fairytale adventure--in Lothar Schreyer's *Death House for a Woman*, a modern interpretation of a medieval recumbent funerary figure, and in the throne-like, crazily hyperbolic *African* chair designed by Breuer and upholstered by Stölzl. At the end there are students' architectural drawings done under the aegis of Mies van der Rohe when he was director of the school in its very last years, works that partake of the master's autocratic, elegant chill, and which can make the machine-tooled work of a few years earlier look friendly by comparison. Although the exhibition layout is essentially open, with spaces flowing one into the other, Bergdoll and Dickerman have skillfully provided us with peak moments, interludes, striking glimpses, and vignettes. There is a partial reconstruction of one of the houses that Gropius designed at Dessau for the key teachers, in this case Kandinsky's dining room, with its dark walls, its rather unappealing, awkward geometric furniture by Breuer, and Kandinsky's own *On White II* hanging on the wall. It is extraordinary to see Klee responding to the work of students, many of whom had been so profoundly affected by his ideas about structure and composition. The subtleties of his *Vocal Fabric of the Singer Rosa Silber*, a modern re-imagining of a page from an illuminated Renaissance songbook, is only further enriched when seen near some magnificent Bauhaus weaving. And the radiant geometry of Klee's *Architecture of the Plane* and *May Picture* are fascinating to study in relation to several of Josef Albers's rich yet astringent stained-glass windows.

Everywhere in the show I felt both the pull toward a unified Bauhaus style and the tug of many individual visions. It is in the nature of the Bauhaus story that it is many stories. And not all of them are easily told in an exhibition. When the architect Hannes Meyer took over as director in 1928, he wanted architectural form to be directly derived from a leftist analysis of social and political imperatives, and he was seen as moving away from Gropius's more formalist orientation. Meyer's vision--reflected here in drawings and photographs related to his Federal School of the German Trade Union Federation, completed in 1930-cannot register as clearly in an exhibition as certain other achievements, but Detlef Mertins's essay in the catalogue of the Modern show fills in the picture. In order to understand the relationship between Gropius's functionalism and Meyer's functionalism, one must grapple with the subtle and not-so-subtle differences between an architecture grounded in social idealism and an architecture that aims to respond to particular social situations and dynamics.

The excellent catalogue is organized around a range of brief essays by a number of scholars, each of which focuses on an individual object or group of objects. The essays zero in on specific works: Moholy-Nagy's experiments in enamel paintings, done by sending specifications to a fabricator; Alma Buscher's shipbuilding toy, a collection of variously colored and shaped blocks, and its relationship to ideas about childhood; the wallpapers that were developed at the Bauhaus, and were the only products still marketed under the Bauhaus name during the Nazi years. To tell the Bauhaus story as a seamless, end-to-end narrative may be impossible. Too much went on. I find it interesting that the catalogue of the other major ninetieth-anniversary Bauhaus show, which opened in Berlin in July, is also organized in terms of an array of brief, highly specific essays. Museumgoers who catch the Bauhaus bug will want to buy not only the Modern catalogue but also the English-language version of the German one, *Bauhaus: A Conceptual Model* (Hatje Cantz). Readers who want to further explore the controversies that have always surrounded the Bauhaus should consult two excellent essay collections, *Bauhaus Conflicts: 1919–2009: Controversies and Counterparts (Hatje Cantz) and Bauhaus Culture: From Weimar to the Cold War (University of Minnesota Press).*

The Modern has also published an English version of a terrific little book about the dominant figure in the textile workshop, *Gunta Stölzl: Bauhaus Master*, which juxtaposes Stölzl's drawings and weavings with excerpts from her diaries, letters, and articles. The result is a fascinating portrait of the Bauhaus artist as a young woman. Born in 1897, the daughter of a progressively minded school principal, Stölzl studied at the Royal School of Art and Crafts and served as a Red Cross nurse in World War I before being accepted at the Bauhaus in 1919. Like many women at the school, she was pushed into the weaving workshop, where she proved herself a great innovator--until it became evident to most of the students, in the mid-1920s, that Stölzl, and not the painter Georg Muche, should be the master of the textile workshop. With her elevation to master in the summer of 1926, she became the only woman to earn that title at the Bauhaus. Through her letters and diaries we gather the picture of a young woman of astonishing passion and determination. She created a scandal at the Bauhaus--progressivism has its limits-

-by giving birth to her first child some five weeks after marrying the father, Arieh Sharon, an architecture student at the school. Finding her way to Switzerland amid the collapse of the Bauhaus, she continued her career there. She died in Zurich in 1983.

Reading Stölzl's early letters to her brother, who was a lawyer, you feel all the romantic idealism of those years, the fearlessness about bucking conventions, the ardor with which art and life were embraced. In one brief memory she evokes a spirit of adventure and discovery that brings to mind the fictions of Nerval. "On long walks through the Thuringian Forest," Stölzl writes, "we came to an old glassblowing workshop and there we found in the attic old samples of completely fantastic, colorful glass animals--which we then also gave to [Paul Klee]--I seem to recall that he was very pleased." At the Bauhaus there was a love of fantasy as well as a love of functionalism. And although they were reluctant to admit it, functionalism sometimes became a form of fantasy. One certainly feels this in the costume parties and theatrical events that were so essential a part of life at the Bauhaus.

Gropius comes across in many accounts of the school as controlling and megalomaniacal, but it is one of the fascinations of the Bauhaus that he surrounded himself with men who were his equals and, in the case of Kandinsky, perhaps a more significant figure in the international avant-garde. With artists of the intellectual caliber and artistic daring of Klee and Kandinsky on the faculty, Gropius's insistence that all the arts were ultimately one art could hardly be the last word, at least not for everybody. It is difficult to imagine that he did not understand this. Could it be that somewhere in his calculations was the thought that conflict was necessary in a great educational institution?

By the time Kandinsky arrived at the Bauhaus in 1922, he had already proved that he could act as freely as any artist alive, perhaps more freely. Going through the early phases of the retrospective at the Guggenheim, I found myself thinking that no other artist had ever broken so definitively with the old sense of a painting as a mirror of the natural world, rejecting the afterimages of perspectival space and naturalistic color and Euclidean physics to which Matisse and Picasso were devoted even when they were at their most abstract. At first it may seem a paradox that Kandinsky was born in 1866, more than a decade before Picasso and Braque, but perhaps this explains his profoundly romantic spirit, a nineteenth-century spirit awakening to a twentieth-century vision of soaring mountains, galloping horses, swift-moving clouds, all turned into abstract gestures, motifs, glimpses, glances. His color is the strangest and most unexpected in modern art, with wild confrontations of strong, divergent hues set alongside colors that have been whitened and grayed and mixed (and mixed again). The effect is clamorous, disquieting, a play of moods, swiftly changing, flashing, disappearing, re-appearing. As for space, it is flexible, fluid, constantly improvised, a coming-into-being. At the Guggenheim, some of the greatest paintings of the years leading up to World War I form a magnificent group in the double-height room just off the beginning of the ramp. They are astral abstractions, topsy-turvydom apotheosized.

Kandinsky was generally regarded as an apolitical man, and surely the spirituality about which he wrote so movingly involved a rejection of all external forces, and thus could make him an anomalous figure in the socially aware ambience of the Bauhaus. In the 1920s, however, it was still possible to sense a relationship between the romantic individualism of Kandinsky and Klee and a larger progressive social enterprise, a connection that would become increasingly fraught in the 1930s, as the Depression and the rise of totalitarianism on the right and the left turned anything that suggested art-for-art's-sake into the ultimate dissident position. Kandinsky came to the school to teach form and color, but in short order he took over the mural-painting workshop, and later that year he produced mural designs for a room in an art exhibition in Berlin. This was not the act of a man who intended to remain in some fin-de-siècle ivory tower. Kandinsky's maquettes, with flurries of forms cascading across dark fields, were turned into full-scale wall paintings by his students, a sure sign that Kandinsky was not indifferent to the promise of a communal avowal, or to the possibility of teaching younger artists how to work broadly and publicly. But for Kandinsky public art did not signal the end of a more personal avowal, and a few years later he was instrumental in setting up at the Bauhaus a free painting workshop, where the art of painting could be pursued for its own sake, without reference to any other artistic activity.

At the Bauhaus, Kandinsky's visual language became cooler, a system of signs and symbols through which he demonstrated the narrative possibilities of an abstract art. Many of the most beautiful works of his Bauhaus years are on paper, where we see his increasingly exacting analysis of his own moods, the conflicts between light and dark, hard and soft, geometric and biomorphic traced with a thrilling graphic exactitude. American critics, beginning with Clement Greenberg in the early 1940s, have seen in the architectonic discipline of the Bauhaus years a weakening of Kandinsky's art, but this strikes me as mostly a prejudice in favor of the painterly that cannot be justified by an unbiased examination of the work.

Kandinsky remained at the Bauhaus until it finally was closed by the Nazis in 1933. He moved to Paris in that year, and although various efforts were made to help him emigrate to the United States, he remained there through the Occupation and died in December 1944, only four months after the Allies liberated the city. In Paris he became, rather like the aging Poussin three centuries earlier, a romantic turned stoic who was still in some philosophical sense a supreme hedonist. *Thirty*, with that many black and light gray rectangles arranged in a checkerboard of subtly shifting dimensions, draws its ebullience from the watchmaker's precision of Kandinsky's draftsmanship. His panoply of jots, dots, squiggles, and arabesques, although rendered in black and gray, illuminate a monochromatic palette, suggesting color incarnate. *Sky Blue*, from 1940, is one of the greatest of all Kandinskys, with shivering, quivering forms suspended in a delicate blue infinity, as sublime as anything by Fra Angelico.

At the Guggenheim, the Kandinsky show fills the entire rotunda, with graphic works occupying galleries to the side. There are aspects of this exhibition that one might criticize. Perhaps the balance is slightly off, with a little too much space devoted to the early years. But the show, which has already been seen in Munich and Paris, is the Guggenheim's first full presentation since the 1980s, and I do not think we can ask for much more. Tracey Bashkoff of the Guggenheim is the curator in charge, and I mean it as high praise when I say that this exhibition offers no theory, no hypothesis, only a great artist straight on.

It is not easy for curators to resist the temptation to give historical material a dramatic spin, and no one ought to underestimate the quiet steadiness of purpose that Barry Bergdoll and Leah Dickerman have brought to their retelling of the Bauhaus story. This is an exhibition in which everything falls into place. The emphasis feels exactly right. Consider the perfect-pitch handling of Oskar Schlemmer's *Bauhaus Stairway*, the painting of figures moving up the stairway of the Bauhaus building in Dessau that for years was one of the very first works visitors encountered at the Museum of Modern Art, where it hung in the museum's own stairway, an invitation to the permanent collection. Painted in 1932, after the Nazi party had shut down the Dessau Bauhaus, the canvas was, as Andreas Huyssen observes in a skillful catalogue essay, a "melancholy memorial to the Bauhaus's utopian ambition." Hanging toward the close of "Bauhaus 1919–1933: Workshops for Modernity," *Bauhaus Stairway* is indeed a work in a valedictory mode. The show might have ended with the Schlemmer painting, a sentimental favorite, but the curators have chosen not to close on this theatrical and somewhat downbeat note, preferring to acknowledge the power of Schlemmer's composition and then shift our attention to the more subtly imaginative achievements of Klee, Kandinsky, and Josef Albers.If there is going to be some criticism of "Bauhaus 1919–1933: Workshops for Modernity," it will probably echo the old complaints about Alfred Barr's--and his successor William Rubin's--historical exhibitions. These were sometimes said to underestimate or downplay the relationship between art and political and social forces. Although not always stated outright, there was a suggestion that by presenting what their detractors described as an essentially formalist reading of modern art, Barr and Rubin were making modern art more palatable for an upper-middle-class audience. Meyer Schapiro criticized Barr's "Cubism and Abstract Art" as "essentially unhistorical" back in 1936, two years before the Bauhaus exhibition was mounted, and although by the time he spoke at Barr's funeral Schapiro had changed his opinion, there always seems to be somebody who is ready to argue that the Modern is denying the political and social implications of modern art. My feeling is that Bergdoll and Dickerman understand what Barr understood, namely that the duty of a museum is to present the visual material in the most lucid and powerful manner possible, allowing museumgoers and scholars to draw their own conclusions. Bergdoll and Dickerman are well aware of the

controversies that have always surrounded the Bauhaus, ranging from attacks on the allegedly dehumanizing qualities of the Bauhaus style to complaints that the school was less interested in transforming society than in finding a place for its products in the marketplace.

"Bauhaus 1919–1933: Workshops for Modernity" is bold yet richly detailed, clear yet never simplistic--it is everything that we want from a Museum of Modern Art show. I do not think it is incidental that both Bergdoll and Dickerman are relative newcomers to the institution. They have no use for the postmodern rehashing of the museum's history that made such an unholy mess of "MoMA2000," the Modern's attempt to assess its own past before construction began on the new building nine years ago. Bergdoll and Dickerman have embraced the museum's enormous role in the history of the Bauhaus without self-consciousness or embarrassment. They understand that the extraordinarily variegated achievements of the Bauhaus can speak for themselves, if only they are given a chance. So go to see "Bauhaus 1919–1933: Workshops for Modernity" and let the works speak to you. See where your thoughts lead. See what you discover. The Nazis may have shut down the school, but they could not dampen the Bauhaus spirit. We are all still students at the Bauhaus, especially this autumn in New York.

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http://www.tnr.com/article/environment-energy/our-bauhaus

Rate of Autism Disorders Climbs to One Percent Among 8-Year-Olds

A new study shows that one in 110 American 8-year-olds is classified as having an autism spectrum disorder (ASD), a 57 percent increase in ASD cases compared to four years earlier. (Credit: iStockphoto/Kim Gunkel)

ScienceDaily (Dec. 18, 2009) — Autism and related development disorders are becoming more common, with a prevalence rate approaching 1 percent among American 8-year-olds, according to new data from researchers at the University of Alabama at Birmingham (UAB) School of Public Health and the Centers for Disease Control and Prevention (CDC).

The study is a partnership between UAB, the CDC and 10 other U.S. research sites. It shows that one in 110 American 8-year-olds is classified as having an autism spectrum disorder (ASD), a 57 percent increase in ASD cases compared to four years earlier.

The new findings, published Dec. 18 in the CDC's Morbidity and Mortality Weekly Report (MMWR), highlight the need for social and educational services to help those affected by the condition, said Beverly Mulvihill, Ph.D., a UAB associate professor of public health and co-author on the study.

ASDs are a group of developmental disabilities such as autism and Asperger disorder that are characterized by delays or changes in childhood socialization, communication and behavior.

"This is a dramatic increase in the number of kids classified as autistic or documented on the spectrum of similar disorders," Mulvihill said. "It is not entirely clear what is causing the rise, but we know major collaborative efforts are needed to improve the understanding and lives of people and families impacted."

The MMWR study discusses possible factors that might contribute to the increase in ASD cases. They include a broader definition of autism disorders and a heightened awareness of ASD by parents, doctors, educators and other professionals. The findings do not address whether or not any of the increase is

attributable to a true increase in the risk of developing ASD, more frequent and earlier diagnoses, and other factors.

Data comes from the Autism and Developmental Disabilities Monitoring (ADDM) Network, a collection of 11 sites in Alabama, Arizona, Colorado, Florida, Georgia, Maryland, Missouri, North Carolina, Pennsylvania, South Carolina and Wisconsin. ADDM reviewers are uniformly trained to review and confirm cases; some children included in the study have documented ASD symptoms but never received a diagnosis.

The study also found that boys are 4.5 times more likely than girls to have ASD, a finding that confirms earlier studies, says Martha Wingate, Dr.P.H., a UAB assistant professor of public health and study co-author.

"It still is not clear why males more frequently are affected," Wingate said. "One thing we know for sure is that more research is needed to quantify the effects of single or multiple factors such as diagnosis patterns, inclusion of milder cases and other components."

The ADDM sites are not selected based on any statistical pattern, but the 300,000-plus children included in the study represent 8 percent of the nation's 8-year-olds.

Story Source:

Adapted from materials provided by University of Alabama at Birmingham, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/12/091218133301.htm

Europe's Flora Is Becoming Impoverished

The Giant Hogweed (Heracleum mantegazzianum) are up to four metres high. It can cause third-degree burns because of the extremely aggressive sap inside the plant. (Credit: André Künzelmann/UFZ)

ScienceDaily (Dec. 18, 2009) — With increasing species richness, due to more plant introductions than extinctions, plant communities of many European regions are becoming more homogeneous. The same species are occurring more frequently, whereas rare species are becoming extinct.

It is not only the biological communities that are becoming increasingly similar, but also the phylogenetic relations between regions. These processes have led to a loss of uniqueness among European floras, scientists from the DAISIE research project have published their findings in the current online edition of the scientific journal *Proceedings of the National Academy of Sciences of the USA (PNAS).*

For their research the scientists analysed the data of flora native to Europe (Flora Europaea), extinct plant species (national red lists) and alien plant species from the DAISIE database. About 1,600 new non-European species were introduced to the approx. 11,000 native European plant species since 1500 A.D. The researchers also took into account those European plants that are native to a particular region of Europe but considered as introduced species in another (approx. 1,700. It works in a similar way for the species considered to be "extinct." While in the whole of Europe only 2 plant species can "really" be considered as extinct, approx. 500 species have become locally extinct. One such example is the Blue Woodruff (*Asperula arvensis*), a weed that grows on cultivated land, which has been greatly displaced particularly from the intensification of agricultural practices. This species is considered to be locally extinct in Germany and Austria for example, whereas it still occurs e.g. in Italy and Spain.

The researchers were able to demonstrate, that biodiversity is increasing in all regions of Europe due to high numbers of alien species. But at the same time the plant communities of the regions are becoming increasingly more homogenous because alien species are distributed relatively consistently over the continent. The remarkable thing is that it is not only the diversity between plant communities that is decreasing (taxonomic homogenisation), but also the phylogenetic diversity.

Phylogenetic diversity reflects the evolutionary history of a community and therefore also its genetic diversity, which can also be an expression of its functional diversity. A phylogenetic tree with high diversity can be imagined as a genealogical tree with a protruding crown, with many strong branches (distantly related species) and numerous twigs (many species). A high phylogenetic and taxonomic diversity (many tree species that look different), presents a wealth of information and ability, making it possible for biological communities to react to environmental changes, like those arising for example from the current global climate change (e.g. climate or land use change). If one finds many very similar looking trees, then one assumes that the flexibility of the communities is no longer as high to be able to react positively to these changes. Put simply: the genealogical tree of the plant species occurring in Europe has got more twigs, but these only sprout from a few large branches.

Biological depletion from loss of species and introduced species is a consequence of global change associated with increasing pressure on the environment (e.g. the intensification of agriculture, the loss of habitat diversity, urbanisation, increasing global traffic and excessive nutrient influx into ecosystems).

"Our studies have shown that in spite of an increase in regional species richness due to species introductions exceeding the local extinctions of plant species in European regions, these are increasingly losing both their phylogenetic and taxonomic uniqueness," according to Dr. Marten Winter from the Helmholtz Center for Environmental Research (UFZ). "In all discussions on `biodiversity' one needs to consider other forms of biodiversity than pure species richness e.g. those of phylogenetic relations. These can supply additionally important information about the condition and possible risks to ecosystems ," the researcher adds.

Over the last few years, the EU project DAISIE (Delivering Alien Invasive Species Inventories for Europe) has gathered for the first time information on all known alien species across Europe. Information on the ecology and distribution of alien plant and animal species was collected and has been made available for interested parties via an Internet database. Research institutes and organizations from 15 nations were involved in the project.

Story Source:

Adapted from materials provided by Helmholtz Association of German Research Centres.

Journal Reference:

1. Marten Winter, Oliver Schweiger, Stefan Klotz, Wolfgang Nentwig, Pavlos Andriopoulos, Margarita Arianoutsou, Corina Basnou, Pinelopi Delipetrou, Viktoras Didziulis, Martin Hejda, Philip E. Hulme, Phil Lambdon, Jan Pergl, Petr Pysek, David B. Roy and Ingolf Kühn. **Losing uniqueness: Plant extinctions and introductions lead to phylogenetic and taxonomic homogenization of the European flora**. *Proceedings of the National Academy of Sciences of the USA (PNAS)*, DOI: 10.1073/pnas.0907088106

http://www.sciencedaily.com/releases/2009/12/091211131516.htm

Mammals May Be Nearly Half Way Toward Mass Extinction

Small herd of buffalo in Utah, U.S. If the planet is headed for another mass extinction like the previous five, each of which wiped out more than 75 percent of all species on the planet, then North American mammals are one-fifth to one-half the way there, according to a University of California, Berkeley, and Pennsylvania State University analysis. (Credit: iStockphoto)

ScienceDaily (Dec. 18, 2009) — If the planet is headed for another mass extinction like the previous five, each of which wiped out more than 75 percent of all species on the planet, then North American mammals are one-fifth to one-half the way there, according to a University of California, Berkeley, and Pennsylvania State University analysis.

Many scientists warn that the perfect storm of global warming and environmental degradation -- both the result of human activity is leading to a sixth mass extinction equal to the "Big Five" that have occurred over the past 450 million years, the last of which killed off the dinosaurs 68 million years ago.

Yet estimates of how dire the current loss of species is have been hampered by the inability to compare species diversity today with the past.

By combining data from three catalogs of mammal diversity in the United States between 30 million years ago and 500 years ago, UC Berkeley and Penn State researchers show that the bulk of mammal extinctions occurred within a few thousand years after the arrival of humans, with losses dropping after that. Although modern humans emerged from Africa into Europe and Asia by about 40,000 years ago, they didn't reach North American until about 13,000 years ago, and most mammal extinctions occurred in the subsequent 1-2,000 years.

"The optimistic part of the study is that we haven't come all that far on extinction in the past 10,000 years," said co-author Anthony Barnosky, UC Berkeley professor of integrative biology. "We have this pulse when humans had their first effect about 13,000 years ago, but diversity has remained pretty steady for about 10,000 years."

He expects to see a similar pattern in Europe after the invasion of Homo sapiens some 40,000 years ago.

In the last 100 or so years, however, "we are seeing a lot of geographic range reductions that are of a greater magnitude than we would expect, and we are seeing loss of subspecies and even a few species. So it looks like we are going into another one of these extinction events."

"I'm optimistic that, because we haven't lost those species yet, if we redouble our conservation efforts we can stem the tide of extinctions and have those species around in the future," he added.

The study's 30 million-year timeline allowed the researchers to compare species diversity over a period of dramatic change in the landscape. The Rocky Mountains and Sierra Nevada ranges formed in the West, while there were dramatic swings in climate that may have been larger than and as fast as the Earth is seeing today, said co-author and UC Berkeley research associate Marc A. Carrasco. Yet these changes did not have a great effect on mammal diversity, compared to what happened when the last glacial period ended, the ice retreated in North America, and humans crossed from Asia into America.

"The only difference is that 13,000 years ago humans appear on the scene," Carrasco said. "The bottom line is, mammals in general were able to deal with these changes in the past. Only when humans arrive do the numbers fall off a cliff."

The analysis by Barnosky, Carrasco and Russell W. Graham, professor of geosciences at Penn State in University Park, Pa., appears online the week of December 13 in the open-access journal *PLoS One*.

Their analysis combined two databases compiled over the past 15 years ago by Graham and one database created by a UC Berkeley team led by Barnosky and Carrasco in the past few years. Graham's databases are FAUNMAP I, which lists all mammal fossils and their geographic ranges in the United States between 40,000 and 500 years ago, and FAUNMAP II, a compilation of mammalian fossils dating from 40,000 to 5 million years ago. The UC Berkeley database is MIOMAP, which includes all fossil occurrences in the U.S. between 5 and 30 million years ago, which covers the Miocene and part of the Oligocene periods. The databases include all terrestrial mammals from shrews to mammoths, except bats.

If similar databases were analyzed for other terrestrial species, such as reptiles or birds, scientists could look for similar patterns, the researchers say. However, few plant or animal groups produce the abundant fossil record of mammals, Carrasco said.

If a similar analysis of European mammal extinctions were performed, Barnosky said, he expects that it would show a similar pulse of extinction following the arrival of humans, followed by a leveling off until the present day. He ascribes that initial pulse of extinction to a synergistic effect of burgeoning humanity and natural global warming after the Ice Age.

"Now here we are again, astronomically increasing the number of humans on the face of the globe, plus unusual climate change," he said. "That seems to be a recipe for extinction that we saw in past and we are seeing again."

The team hopes to extend its analysis to mammals in other areas of the globe, and use the database to monitor the pace of mammal extinctions.

"One strength of the analysis is that it provides a baseline for judging not only the past, but the future," Carrasco said.

"There is a bit of urgency here, Barnosky said. "By demonstrating that we have already lost 15 to 42 percent of mammalian diversity, the question is, Do we really want to lose any more. I think the answer to that is pretty obvious."The work was supported by the National Science Foundation programs in geosciences and environmental biology.

Story Source:

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http://www.sciencedaily.com/releases/2009/12/091217115838.htm