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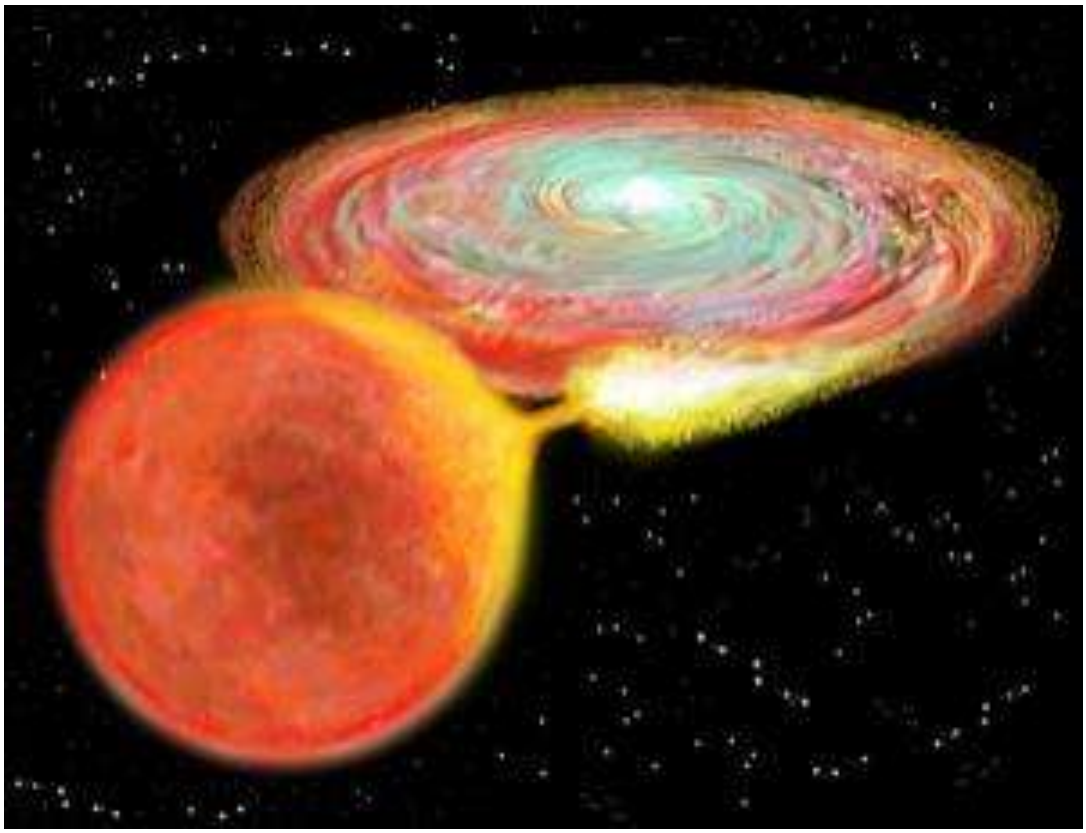
Undead stars rise again as supernovae

- 17:22 28 October 2011 by **David Shiga**



Ancient and undead *(Image: Russell Kightley/Science Photo Library)*

Astrophile is our weekly column covering curious cosmic objects, from within the solar system to the furthest reaches of the multiverse

Object type: white dwarf
Number known: 10 in our galaxy

Ten thousand light years away, the burned-out core of a dead star quietly circles a sun-like companion. Though the stellar corpse shows no signs of life, it is a cosmic vampire, biding its time as it slowly sucks gas from its mate.

Decades later, a blinding flash 100,000 times brighter than the sun heralds the undead star's reawakening: it has finally accumulated enough stolen fuel to power nuclear fusion once more. The star shines brightly for a few glorious days before returning to its deathlike slumber for years or decades, until the whole sequence repeats itself.

Spectacular as they are, these resurrections are just the prelude to the final act, when the undead star will go supernova, finally obliterating itself as it outshines our entire galaxy.

That at least is the suggestion of recent measurements of one such sleeper star, also known as a recurrent nova. They support the theory that these novae are the long-sought progenitors of a very interesting kind of exploding star: type 1a supernova.

Nature of darkness

Finding these progenitors would be a boon to the study of dark energy, the mysterious entity thought to be accelerating the expansion of the universe. It was type 1a supernovae that led to the identification of the mysterious stuff in the first place, garnering three cosmologists a Nobel prize earlier this year. All type 1a evolve from a type of star called a white dwarf, but pinning down exactly which white dwarfs are supernova precursors could lead to much more precise measurements of dark energy – and even reveal its true nature.

The hunt has been on for decades. Recurrent novae were first discovered in 1913, but it wasn't until the 1970s that they became prime suspects. That was when they were identified as heavy white dwarfs with a mass very close to the supernova "tipping point" of 1.4 times the mass of the sun. When a white dwarf grows heavier than this, it can no longer support its own weight and starts collapsing, triggering nuclear reactions that rip the star to shreds in a type 1a supernova.

Still it has been difficult to prove that recurrent novae get massive enough to make the transition from heavy white dwarf to type 1a explosion. They steal gas from their neighbours, but also shed it during their outbursts, so it wasn't clear whether they gain or lose material overall.

Gain or lose?

To settle this question, Bradley Schaefer of Louisiana State University in Baton Rouge analysed measurements of the recurrent nova CI Aquilae from before and after its 2000 eruption.

Heavier pairs of stars orbit each other faster because of their stronger gravity. That means that any mass lost by the white dwarf would lengthen its orbital period.

Schaefer's team found that there was no measurable change in CI Aquilae's 15-hour orbital period after the eruption. Given the accuracy of their observations, this means the white dwarf cannot have lost more than one-millionth of the sun's mass in the event.

As it is estimated to steal more than twice that amount from its companion between eruptions, it must gain mass overall, Schaefer concludes.

Eagle-eyed amateurs

The conclusion is tentative because of possible measurement errors. But fortunately, eagle-eyed amateurs have caught two more of the 10 known recurrent novae in the process of erupting – U Scorpii in January 2010 and T Pyxidis last April.

T Pyxidis was a surprise, but Schaefer had predicted when U Scorpii would rise again, so space telescopes and ground-based observatories were ready to pounce on it. "We plastered that thing with observations – it was awesome," Schaefer says.

The analysis of those observations, along with measurements of orbital periods over the next few years, could help recurrent novae beat rival candidates for the role of true type 1a progenitors.

That would be a breakthrough for the study of dark energy. Type 1a supernova all seem to have the same intrinsic brightness, so their apparent brightness can be used to work out how far away they are. That, in turn, allows us to estimate how fast the universe's expansion is accelerating. However, these so-called "standard candles" do vary slightly from one another, limiting the precision of such measurements.

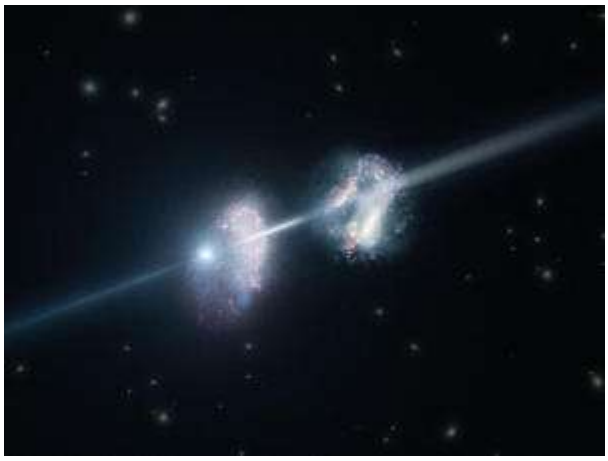
Knowing the properties of the stars that produce these type 1a explosions could help researchers better understand their variations, allowing more precise estimates of the acceleration of cosmic expansion. These in turn will be crucial to distinguishing between different theories for dark energy's origin.

"You can't get that high accuracy unless you know what the progenitor is," says Schaefer. "We desperately need to know."

Journal reference: the research will be published in a forthcoming edition of *The Astrophysical Journal*

http://www.newscientist.com/article/dn18131-astrophile-undead-stars-rise-again-as-supernovae.html?full=true&print=true

Observations of Gamma-Ray Burst Reveal Surprising Ingredients of Early Galaxies



This artist's impression shows two galaxies in the early Universe. The brilliant explosion on the left is a gamma-ray burst. The light from the burst travels through both galaxies on its way to Earth (outside the frame to the right). Analysis of observations of the light from this gamma-ray burst made using ESO's Very Large Telescope have shown that these two galaxies are remarkably rich in heavier chemical elements. (Credit: ESO/L. Calçada)

ScienceDaily (Nov. 2, 2011) — An international team of astronomers led by the Max Planck Institute for Extraterrestrial Physics has used the brief but brilliant light of a distant gamma-ray burst as a probe to study the make-up of very distant galaxies. Surprisingly the new observations revealed two galaxies in the young Universe that are richer in the heavier chemical elements than the Sun. The two galaxies may be in the process of merging. Such events in the early Universe will drive the formation of many new stars and may be the trigger for gamma-ray bursts.

Gamma-ray bursts are the brightest explosions in the Universe. They are first spotted by orbiting observatories that detect the initial short burst of gamma rays. After their positions have been pinned down, they are then immediately studied using large ground-based telescopes that can detect the visible-light and infrared afterglows that the bursts emit over the succeeding hours and days. One such burst, called GRB 090323, was first spotted by the NASA Fermi Gamma-ray Space Telescope. Very soon afterwards it was picked up by the X-ray detector on NASA's Swift satellite and with the GROND system at the MPG/ESO 2.2-metre telescope in Chile. From the GROND observations, the astronomers estimated the minimum rate of star formation, which has to be several times higher than the one in our Galaxy. They could, however, only determine a minimum value because the detected emission could be heavily affected (i.e. absorbed) by the presence of dust in the galaxies. The real rate of star formation, once the (unknown) dust absorption has been taken into account, could easily be 50 times higher than in the Milky Way.

The burst was also studied in great detail using ESO's Very Large Telescope (VLT) just one day after it exploded. These observations show that the brilliant light from the gamma-ray burst had passed through its own host galaxy and another galaxy nearby. These galaxies are being seen as they were about 12 billion years ago. Such distant galaxies are very rarely caught in the glare of a gamma-ray burst.

"When we studied the light from this gamma-ray burst we didn't know what we might find. It was a surprise that the cool gas in these two galaxies in the early Universe proved to have such an unexpected chemical make-up," explains Sandra Savaglio (Max-Planck Institute for Extraterrestrial Physics, Garching, Germany), lead author of the paper describing the new results. "These galaxies have more heavy elements than have ever been seen in a galaxy so early in the evolution of the Universe. We didn't expect the Universe to be so mature, so chemically evolved, so early on."

As light from the gamma-ray burst passed through the galaxies, the gas there acted like a filter, and absorbed some of the light from the gamma-ray burst at certain wavelengths. Without the gamma-ray burst these faint galaxies would be invisible. By carefully analysing the tell-tale fingerprints from different chemical elements the team was able to work out the composition of the cool gas in these very distant galaxies, and in particular how rich they were in heavy elements.

It is expected that galaxies in the young Universe will be found to contain smaller amounts of heavier elements than galaxies at the present day, such as the Milky Way. The heavier elements are produced during the lives and deaths of generations of stars, gradually enriching the gas in the galaxies. Astronomers can use the chemical enrichment in galaxies to indicate how far they are through their lives. But the new observations, surprisingly, revealed that some galaxies were already very rich in heavy elements less than two billion years after the Big Bang. Something unthinkable until recently.

The newly discovered pair of young galaxies must be forming new stars at a tremendous rate, to enrich the cool gas so strongly and quickly. As the two galaxies are close to each other they may be in the process of merging, which would also provoke star formation when the gas clouds collide. The new results also support the idea that gamma-ray bursts may be associated with vigorous massive star formation.

Energetic star formation in galaxies like these might have ceased early on in the history of the Universe. Twelve billion years later, at the present time, the remains of such galaxies would contain a large number of stellar remnants such as black holes and cool dwarf stars, forming a hard to detect population of "dead galaxies," just faint shadows of how they were in their brilliant youths. Finding such corpses in the present day would be a challenge.

"We were very lucky to observe GRB 090323 when it was still sufficiently bright, so that it was possible to obtain spectacularly detailed observations with the VLT. Gamma-ray bursts only stay bright for a very short time and getting good quality data is very hard. We hope to observe these galaxies again in the future when we have much more sensitive instruments, they would make perfect targets for the E-ELT," concludes Savaglio.

Story Source:

The above story is reprinted from materials provided by **Max-Planck-Institut für extraterrestrische Physik (MPE)**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. S. Savaglio et al. **Super-solar Metal Abundances in Two Galaxies at z~3.57 revealed by the GRB090323 Afterglow Spectrum**. *Monthly Notices of the Royal Astronomical Society*, 2011

http://www.sciencedaily.com/releases/2011/11/111102092929.htm

How innovative is Apple's new voice assistant, Siri?

- 03 November 2011 by **Jacob Aron**
- Magazine issue 2836.

Your iPhone is listening *(Image: Joshua Sudock/The Orange County Register/Zumapress/Corbis)*

IT LETS you check the weather or make an appointment simply by asking aloud, but is Siri, the "personal assistant" on Apple's newly released iPhone 4S, really such an advance?

Yes, says Boris Katz, an artificial intelligence (AI) researcher at MIT. He says Apple has created a "very impressive piece of engineering" by combining established techniques from fields such as voice recognition and natural language processing.

Phil Blunsom, who researches machine learning at the University of Oxford, stresses that Apple hasn't just put together existing techniques. But he has reservations: "The difficulty is that each one of these systems makes errors, and when they are fed into each other the errors multiply."

Apple won't talk about Siri's underlying technology, though a patent application it filed earlier this year reveals that the software manages these errors by restricting queries to specific areas like dining or the weather. Apple calls such themes, for which Siri has access to databases of information, "active ontologies". For example, the dining ontology contains databases of restaurants, cuisines and dishes, along with information on the concept of a meal - that it involves one or more people gathering to eat.

The active ontology idea is not new - Tom Gruber, one of the inventors of Siri, formally defined it in 1995. What is unusual about Siri is that, unlike earlier grand AI projects, it is "very specifically focused on helping in particular domains", says Philip Resnik, a computational linguist at the University of Maryland in College Park. "If you go out of those domains, all bets are off."

Siri listens out for keywords such as "Mexican" or "taco" to identify the subject area. It also works out whether to prompt for more information - such as what time to book a table - or whether it has enough details to access a reservations website and make the booking. This final step is possible because most web services

now offer application programming interfaces (APIs) that let apps feed information to them. "That's one of the reasons Siri is possible now when it wouldn't have been five or 10 years ago," says Resnik.

The ability to make sense of requests phrased in ordinary language sets Siri apart from competitors such as Android's Voice Actions, which requires commands in a certain format - saying "navigate to" will elicit directions, but "how do I get to... ?" will not. It doesn't look as if Google is planning a Siri competitor yet. "I don't believe that your phone should be an assistant," said Andy Rubin, who heads Android development at Google, last week.

Siri will only get better. All queries users put to it are processed by Apple's servers, giving the company a wealth of data it can use to improve the app. Katz suggests Apple could mine this data to discover commonly asked questions that Siri cannot yet handle. That's simple enough, but what about asking it to "book a meal for my family when we're all available"?

"Siri 2 might involve taking advantage of the fact that many of the tasks you attempt to solve have a social aspect to them," says Resnik. So, for example, the Siris on your family members' iPhones could all work together to organise the meal.

Blunsom says Apple must try to keep expectations realistic, otherwise people might dismiss Siri because it "can't answer esoteric questions, despite the fact that it can find you a good sushi restaurant nearby".

http://www.newscientist.com/article/mg21228365.300-how-innovative-is-apples-new-voice-assistant-siri.html?full=true&print=true

Evolution During Human Colonizations: Selective Advantage of Being There First

Vintage engraving of the city of Quebec in the 18th century. (Credit: iStockphoto/Duncan Walker)

ScienceDaily (Nov. 3, 2011) — Research published in *Science* Nov. 3 reveals that the first individuals settling on new land are more successful at passing on their genes than those who did not migrate. According to Dr. Damian Labuda at the University of Montréal and Sainte-Justine Hospital, the study suggests that population expansion creates opportunities for natural selection to act.

The findings come from the utilization of a unique research infrastructure, the BALSAC population database which allows the reconstruction of the structure of the Quebec population over four centuries. In this research the descending lineages of all couples married in the Charlevoix-Saguenay Lac St-Jean region between 1686 and 1960 were analyzed. This genealogy comprises more than 1 million individuals.

Dr. Laurent Excoffier, University of Berne and Swiss Institute of Bioinformatics, Dr. Damian Labuda, and Dr. Hélène Vézina, Projet BALSAC, Université du Québec à Chicoutimi, who led the study, together with research associates Claudia Moreau, Michèle Jomphe and Ph.D. student Claude Bhérer, investigated the demographic history of this region to investigate the effects of rapid territorial and demographic expansion on the dynamics of colonization and human evolution.

"We find that families who are at the forefront of a range expansion into new territories had greater reproductive success. In other words, that they had more children, and more children who also had children," Labuda explained. "As a result, these families made a higher genetic contribution to the contemporary population than those who remained behind in what we call the *range core*, as opposed to the *wave front*.

The research confirms in humans a phenomenon that has already been observed in other species with much shorter generation spans. "We knew that the migration of species into new areas promoted the spread of rare mutations through a phenomenon known as 'gene surfing', but now we find that selection at the wave front could make this surfing much more efficient," Excoffier said. This evolutionary mechanism in combination with founder effects and social or cultural transmission of reproductive behavior could explain why some

genetic diseases are found at an elevated frequency in the Charlevoix and Saguenay Lac Saint-Jean regions where the study was carried out, as rare mutations can also surf during a range expansion.

"It is exciting to see how a study on a regional population of Quebec can bring insight on a human process that has been going on for thousands of years. The BALSAC population is a powerful tool for social and genetic research and this study is a very nice demonstration of its possibilities," Vézina said.

The researchers also note that, although their study concerns a whole human population spread over several centuries, it only represents a short period of human evolution at a limited geographical scale. It thus appears difficult to directly generalize these results obtained in a farmer population to what happened during other range expansions, especially considering the differences between the ecological demography of hunter-gatherer and farmer communities. But given the highly successful history of the human colonization of our planet, it appears very likely that a considerable fraction of our ancestors have lived on the edge of expansion waves. Consequently, several human traits favoring dispersal and reproduction could have evolved during phases of range expansions rather than resulting from selection in constant environments.

"This was a very productive sabbatical stay of Laurent Excoffier in Montreal, putting all our teams together, and indeed a very encouraging beginning setting stage for subsequent collaborative studies" Labuda said. Using BALSAC we plan to expand the research to other regions of Quebec and other suitable populations elsewhere.

Story Source:

The above story is reprinted from materials provided by **University of Montreal**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Claudia Moreau, Claude Bhérer, Hélène Vézina, Michèle Jomphe, Damian Labuda, and Laurent Excoffier. **Deep human genealogies reveal a selective advantage to be on an expanding wave front**. *Science*, 2011 DOI: 10.1126/science.1212880

http://www.sciencedaily.com/releases/2011/11/111103143237.htm

Report questions long-term safety of composite planes

- 03 November 2011 by **Paul Marks**
- Magazine issue 2837.

Plastic fantastic, or a safety risk? *(Image: Bloomberg/Getty Images)*

ON 1 NOVEMBER the first aircraft with a pressurised fuselage and wings made from carbon-fibre reinforced plastic (CFRP) flew its first passengers from Tokyo to Hiroshima. The All Nippon Airways Boeing 787's composite structure makes it around 15 per cent lighter than a typical aluminium-based plane of that size, increasing fuel efficiency and making aviation greener.

But the media hoopla over the flight disguised some worrying questions about the long-term safety of composite aircraft. On 20 October, the US Government Accountability Office (GAO) published a report which, while accepting that the 787 has been certified as airworthy, questions the ability of the US regulator, the Federal Aviation Administration, to ensure that inspectors are capable of assessing and repairing damage to composite structures over the long life of a plane.

"It is too early to fully assess the adequacy of FAA and industry efforts to address safety-related concerns and to build sufficient capacity to handle composite maintenance and repair," says the GAO.

Until now, only smaller, isolated pieces of secondary structure, such as tail fins and wing leading edges, have been made from composites. The GAO reviewed the scientific literature and interviewed engineers about the evidence underpinning the expansion of composite use to incorporate the whole fuselage. On damage and ageing issues it found the science wanting.

The GAO found that engineers don't know how such materials will behave when damaged, what such damage will look like, and how these factors change as the material ages. Because composite damage is hard to detect - indeed it can be effectively invisible - working out what risk a dent poses is difficult. Too few inspectors are being trained to diagnose such damage, the GAO report adds.

Boeing has no doubts. "We test, we analyse and we demonstrate that even in extreme conditions - which may never be experienced in a full life of service - the airplane is safe and durable," the firm said in a statement.

A composite is made by combining multiple layers of carbon fibres with an epoxy resin. It has a higher strength-to-weight ratio than aluminium and resists corrosion. But it has different fatigue problems: it tends to snap, rather than bend or stretch over time like a metal.

Although the Boeing 787 is deemed safe, the GAO says regulators must focus on assessing composite damage in service. "The long-term ageing behaviour of these composite materials is indeed an unknown," says Philip Irving, an aviation structures specialist at Cranfield University in the UK. "What is going to happen to these structures, which are often bonded as a single piece, in the 30-year lifetime of an aircraft?" Much is known about metal, he says. "There is almost nothing equivalent published on composite-structure damage, visibility and growth - and the necessary research is still under way," he says.

Some of that research is being done by the Commercial Aircraft Composite Repair Committee, says Boeing, an industry-wide effort involving regulators and manufacturers, including Airbus (which is building its own composite fuselage plane, the A350). In the meantime, Irving says ground staff will need to wield one of their most powerful tools to track down damage in composite planes: "Their eyeballs."

http://www.newscientist.com/article/mg21228376.300-report-questions-longterm-safety-of-composite-planes.html?full=true&print=true

Brain Cells Responsible for Keeping Us Awake Identified

Researchers have identified the group of neurons that mediates whether light arouses us and keeps us awake, or not. (Credit: iStockphoto/Osman Safi)

ScienceDaily (Nov. 3, 2011) — Bright light arouses us. Bright light makes it easier to stay awake. Very bright light not only arouses us but is known to have antidepressant effects. Conversely, dark rooms can make us sleepy. It's the reason some people use masks to make sure light doesn't wake them while they sleep.

Now researchers at UCLA have identified the group of neurons that mediates whether light arouses us -- or not. Jerome Siegel, a professor of psychiatry at the Semel Institute for Neuroscience and Human Behavior at UCLA, and colleagues report in the current online edition of the *Journal of Neuroscience* that the cells necessary for a light-induced arousal response are located in the hypothalamus, an area at the base of the brain responsible for, among other things, control of the autonomic nervous system, body temperature, hunger, thirst, fatigue -- and sleep.

These cells release a neurotransmitter called hypocretin, Siegel said. The researchers compared mice with and without hypocretin and found that those who didn't have it were unable to stay awake in the light, while those who had it showed intense activation of these cells in the light but not while they were awake in the dark.

This same UCLA research group earlier determined that the loss of hypocretin was responsible for narcolepsy and the sleepiness associated with Parkinson's disease. But the neurotransmitter's role in normal behavior was, until now, unclear.

"This current finding explains prior work in humans that found that narcoleptics lack the arousing response to light, unlike other equally sleepy individuals, and that both narcoleptics and Parkinson's patients have an increased tendency to be depressed compared to others with chronic illnesses," said Siegel, who is also a member of the UCLA Brain Research Institute and chief of neurobiology research at the Sepulveda Veterans Affairs Medical Center in Mission Hills, Calif.

Prior studies of the behavioral role of hypocretin in rodents had examined the neurotransmitter's function during only light phases (normal sleep time for mice) or dark phases (their normal wake time), but not both. And the studies only examined the rodents when they were performing a single task.

In the current study, researchers examined the behavioral capabilities of mice that had their hypocretin genetically "knocked-out" (KO mice) and compared them with the activities of normal, wild-type mice (WT)

that still had their hypocretin neurons. The researchers tested the two groups while they performed a variety of tasks during both light and dark phases.

Surprisingly, they found that the KO mice were only deficient at working for positive rewards during the light phase. During the dark phase, however, these mice learned at the same rate as their WT littermates and were completely unimpaired in working for the same rewards.

Consistent with the data in the KO mice, the activity of hypocretin neurons in their WT littermates was maximized when working for positive rewards during the light phase, but the cells were not activated when performing the same tasks in the dark phase.

"The findings suggest that administering hypocretin and boosting the function of hypocretin cells will increase the light-induced arousal response," Siegel said. "Conversely, blocking their function by administering hypocretin receptor blockers will reduce this response and thereby induce sleep."

Further, Siegel noted, "The administration of hypocretin may also have antidepressant properties, and blocking it may increase tendencies toward depression. So we feel this work has implications for treating sleep disorders as well as depression."

Other authors on the study included Ronald McGregor (first author), Ming-Fung Wu, Grace Barber and Lalini Ramanathan, all of UCLA, the Veterans Affairs Greater Los Angeles Healthcare System and the UCLA Brain Research Institute.

The research was supported by the National Institutes of Health and the Medical Research Service of the Department of Veterans Affairs. The authors report no conflict of interest.

Story Source:

The above story is reprinted from materials provided by **University of California - Los Angeles**. The original article was written by Mark Wheeler.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/11/111103143434.htm

How fracking caused earthquakes in the UK

- 17:45 02 November 2011 by **Michael Marshall**

In April and May this year, two small earthquakes struck the UK near the town of Blackpool. Suspicion immediately fell on hydraulic fracturing, known as fracking – a controversial process to extract natural gas by fracturing the surrounding rock. A report has now confirmed that fracking caused the earthquakes.

New Scientist looks at what happened, and whether fracking is likely to cause more earthquakes.

When and where did the earthquakes happen?
A magnitude-2.3 earthquake occurred on 1 April, followed by a magnitude-1.5 quake on 27 May. Both occurred close to the Preese Hall drilling site, where Cuadrilla Resources was using fracking to extract gas from a shale bed.

Initial studies by the British Geological Survey (BGS) suggested that the quakes were linked to Cuadrilla's fracking activities. The epicentre of the second quake was within 500 metres of the drilling site, at a depth of 2 kilometres. Less information was available on the first quake, but it seems to have been similar.

The link with fracking has now been confirmed by an independent report commissioned by Cuadrilla, *Geomechanical Study of Bowland Shale Seismicity*, which states: "Most likely, the repeated seismicity was induced by direct injection of fluid into the fault zone."

The two geologists who wrote the report ran detailed models to show that the fracking could – and most likely did – provoke the quakes.

How did the fracking cause the earthquakes?
Fracking works by injecting huge volumes of water into the rocks surrounding a natural gas deposit. The water fractures the rocks, creating dozens of cracks through which the gas can escape to the surface.

The UK quakes were not caused by the violent rupturing of the rocks, as you might expect, but by the presence of water. This lubricates the rocks and pushes them apart, allowing them to slip past each other. "It's a bit like oiling the fault," says Brian Baptie of the BGS.

Seismologists have not been able to find the fault that moved, probably because it is tiny. Baptie says the surface area of the fault is likely to be just 100 metres by 100 metres, and that the rocks moved by about 1 centimetre – the seismological equivalent of a needle in a haystack.

So should we expect lots more earthquakes from fracking?
It's difficult to say. Fracking has been going on in the US for decades, and has become much more common in recent years, yet evidence that it causes earthquakes has so far been elusive. "This is one of the first times felt earthquakes have been associated with fracking," Baptie says.

The Cuadrilla report says the earthquakes occurred because of a rare combination of circumstances: the fault was already under stress, was brittle enough to fracture and had space for large amounts of water that could lubricate it. The report says this is unlikely to happen again at the Preese Hall site.

Baptie is not so sure. He says small faults are probably common in deep rocks, but go undetected because of their size. "It seems quite possible, given the same injection scheme in the same well, that there could be further earthquakes," he says.

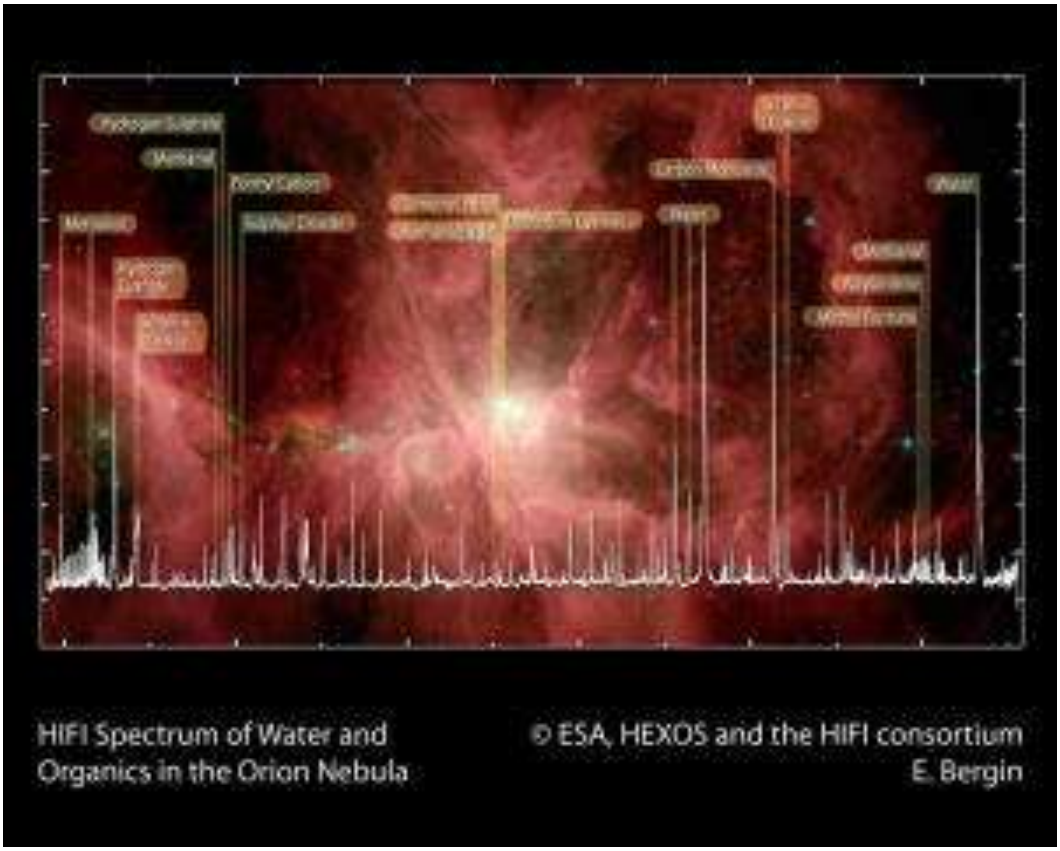
Cuadrilla is proposing to monitor seismic activity around its fracking site. If earthquakes begin to occur, it could reduce the flow of water into the well, or even pump it back out, preventing the bigger quakes. Baptie says such monitoring is now necessary to avoid further quakes at fracking sites.

Are these earthquakes dangerous?
Not particularly. Magnitude-2.3 earthquakes can shake the ground enough for people to notice, especially if they occur close to the surface, but damage is normally limited to objects falling off shelves.

According to Baptie, the UK gets an average of 15 magnitude-2.3 earthquakes every year, so the quakes produced by the fracking are not out of the ordinary.

http://www.newscientist.com/article/dn21120-how-fracking-caused-earthquakes-in-the-uk.html?full=true&print=true

Astrobiologists Discover 'Sweet Spots' for the Formation of Complex Organic Molecules in the Galaxy



Spectrum showing water and organics in the Orion nebula. The data were taken by the heterodyne instrument for the far infrared, or HIFI, onboard the Herschel Space Observatory. (Credit: Courtesy of ESA/NASA/JPL-Caltech)

ScienceDaily (Nov. 2, 2011) — Scientists within the New York Center for Astrobiology at Rensselaer Polytechnic Institute have compiled years of research to help locate areas in outer space that have extreme potential for complex organic molecule formation. The scientists searched for methanol, a key ingredient in the synthesis of organic molecules that could lead to life. Their results have implications for determining the origins of molecules that spark life in the cosmos.

The findings will be published in the Nov. 20 edition of *The Astrophysical Journal* in a paper titled "Observational constraints on methanol production in interstellar and preplanetary ices." The work is collaboration between researchers at Rensselaer, NASA Ames Research Center, the SETI Institute, and Ohio State University.

"Methanol formation is *the* major chemical pathway to complex organic molecules in interstellar space," said the lead researcher of the study and director of the NASA-funded center, Douglas Whittet of Rensselaer. If scientists can identify regions where conditions are right for rich methanol production, they will be better able to understand where and how the complex organic molecules needed to create life are formed. In other words, follow the methanol and you may be able to follow the chemistry that leads to life.

Using powerful telescopes on Earth, scientists have observed large concentrations of simple molecules such as carbon monoxide in the clouds that give birth to new stars. In order to make more complex organic

molecules, hydrogen needs to enter the chemical process. The best way for this chemistry to occur is on the surfaces of tiny dust grains in space, according to Whittet. In the right conditions, carbon monoxide on the surface of interstellar dust can react at low temperatures with hydrogen to create methanol (CH_3OH). Methanol then serves as an important steppingstone to formation of the much more complex organic molecules that are required to create life. Scientists have known that methanol is out there, but to date there has been limited detail on where it is most readily produced.

What Whittet and his collaborators have discovered is that methanol is most abundant around a very small number of newly formed stars. Not all young stars reach such potential for organic chemistry. In fact, the range in methanol concentration varies from negligible amounts in some regions of the interstellar medium to approximately 30 percent of the ices around a handful of newly formed stars. They also discovered methanol for the first time in low concentrations (1 to 2 percent) in the cold clouds that will eventually give birth to new stars.

The scientists conclude in the paper that there is a "sweet spot" in the physical conditions surrounding some stars that accounts for the large discrepancy in methanol formation in the galaxy. The complexity of the chemistry depends on how fast certain molecules reach the dust grains surrounding new stars, according the Whittet. The rate of molecule accumulation on the particles can result in an organic boom or a literal dead end.

"If the carbon monoxide molecules build up too quickly on the surfaces of the dust grains, they don't get the opportunity to react and form more complex molecules. Instead, the molecules get buried in the ices and add up to a lot of dead weight," Whittet said. "If the buildup is too slow, the opportunities for reaction are also much lower."

This means that under the right conditions, the dust surrounding certain stars could hold greater potential for life than most of its siblings. The presence of high concentrations of methanol could essentially jumpstart the process to create life on the planets formed around certain stars.

The scientists also compared their results with methanol concentrations in comets to determine a baseline of methanol production in our own solar system.

"Comets are time capsules," Whittet said. "Comets can preserve the early history of our solar system because they contain material that hasn't changed since the solar system was formed." As such, the scientists could look at the concentrations of methanol in comets to determine the amount of methanol that was in our solar system at its birth.

What they found was that methanol concentrations at the birth of our solar system were actually closer to the average of what they saw elsewhere in interstellar space. Methanol concentrations in our solar system were fairly low, at only a few percent, compared to some of the other methanol-dense areas in the galaxy observed by Whittet and his colleagues.

"This means that our solar system wasn't particularly lucky and didn't have the large amounts of methanol that we see around some other stars in the galaxy," Whittet said.

"But, it was obviously enough for us to be here."

The results suggest that there could be solar systems out there that were even luckier in the biological game than we were, according to Whittet. As we look deeper into the cosmos, we may eventually be able to determine what a solar system bursting with methanol can do.

Story Source:

The above story is reprinted from materials provided by **Rensselaer Polytechnic Institute**.

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http://www.sciencedaily.com/releases/2011/11/111102190028.htm

Paper scans unmask Livingstone's fury at slave killing

- 16:53 02 November 2011 by **Andy Coghlan**

"I proposed to catch the bloodhounds who fired in the market and on the canoes and put their heads on poles" *(Image: David Livingstone Centre/Birkbeck, University of London)*

Explorer David Livingstone has been credited with ending the east African slave trade by reporting a massacre of slaves in 1871. A new analysis of his original diary entries, however, shows that he sanitised his account.

Deciphered through sophisticated digital imaging techniques, the entries reveal his previously unreported hunger to avenge the massacre of 400 out of 1500 slaves gathered for sale in a market in Nyangwe, a village in what is now the eastern Democratic Republic of the Congo. They were slaughtered by slave traders firing indiscriminately into the throng.

News of the massacre emerged in the world press after Livingstone recounted the events to the journalist Henry Stanley after their famous meeting.

Stanley's reports of the massacre changed history, prompting the British government to close the east African slave trade, and sealed Livingstone's place in history as the catalyst for abolition.

But the newly deciphered diary entries demonstrate how Livingstone sanitised his own original accounts of the massacre, omitting raw emotional reactions to what he witnessed. They also reveal that he denied the possibility that those guilty of the massacre were part of his own party.

Heads on poles

In the "official" version, for example, Livingstone makes excuses for not pursuing the murderers, writing: "My first impulse was to pistol the murderers but Dugumbe [a leading slave trader in the village] protested against my getting into a blood feud and I was thankful afterwards that I took his advice."

In the original diary, Livingstone was far more impassioned about finding the culprits, writing: "I went over to Dugumbe and proposed to catch the bloodhounds who fired in the *chitoka* [market] and on the canoes and put their heads on poles."

"He was clearly furious, bewildered and devastated by what had happened," says project director Adrian Wisnicki of Indiana University of Pennsylvania, who is also a research fellow at Birkbeck, University of London.

Livingstone had slaves of his own at the time, and they were accused of being involved in the massacre. His original entry is ambiguous on this point: "Shot after shot followed on the terrified fugitives – great numbers died – and a worthless Moslem asserted that all was done by the people of the English – this will spread though the murderers are on the other side [of the river] plundering and shooting."

In his sanitised version, he is much more adamant about clearing his own party of blame, writing: "Two wretched Moslems asserted 'that the firing was done by the people of the English'. I asked one of them why he lied so and could utter no excuse."

Livingstone himself sanitised his original 1871 entries when he copied them into his journal a year later, and these were edited further before they were published.

Invisible ink

Now historians can read the original, 80-page diary, thanks to a digital imaging technique that involves scanning the text with 12 different wavelengths of light, from infrared through to blue.

The entries have been illegible until now because Livingstone, lacking proper ink and paper, wrote them using pigments from berries on newspaper that was already covered with printed text. Over time, the pigments faded, blurred and merged illegibly with the underlying newsprint.

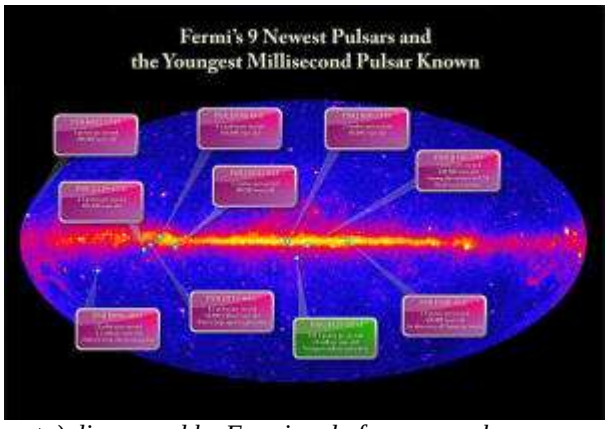
After scanning each page with the different wavelengths, researchers led by Mike Toth of R. B. Toth Associates – a company based in Washington DC that specialises in imaging ancient manuscripts – were able to distinguish Livingstone's original words written in "berry" ink.

Wisnicki says the original accounts, which took 18 months to decipher, give historians a new, vivid picture of what happened at the time. Till now, they have mostly relied on *The Last Journals of David Livingstone, in Central Africa, from 1865 to His Death*, a compendium of Livingstone's journals edited after the explorer's death in 1873 by his close friend, Horace Waller, and published a year later.

Livingstone's 1871 Field Diary: A multispectral critical edition, funded by the British Academy and the US National Endowment for the Humanities, is now available free online through a digital library hosted by the University of California, Los Angeles.

http://www.newscientist.com/article/dn21115-paper-scans-unmask-livingstones-fury-at-slave-killing.html

NASA's Fermi Finds Youngest Millisecond Pulsar, 100 Pulsars To-Date



This plot shows the positions of nine new pulsars (magenta) discovered by Fermi and of an unusual millisecond pulsar (green) that Fermi data reveal to be the youngest such object known. With this new batch of discoveries, Fermi has detected more than 100 pulsars in gamma rays. (Credit: NASA/DOE/Fermi LAT Collaboration)

ScienceDaily (Nov. 3, 2011) — An international team of scientists using NASA's Fermi Gamma-ray Space Telescope has discovered a surprisingly powerful millisecond pulsar that challenges existing theories about how these objects form.

At the same time, another team has located nine new gamma-ray pulsars in Fermi data, using improved analytical techniques.

A pulsar is a type of neutron star that emits electromagnetic energy at periodic intervals. A neutron star is the closest thing to a black hole that astronomers can observe directly, crushing half a million times more mass than Earth into a sphere no larger than a city. This matter is so compressed that even a teaspoonful weighs as much as Mount Everest.

"With this new batch of pulsars, Fermi now has detected more than 100, which is an exciting milestone when you consider that, before Fermi's launch in 2008, only seven of them were known to emit gamma rays," said Pablo Saz Parkinson, an astrophysicist at the Santa Cruz Institute for Particle Physics at the University of California Santa Cruz, and a co-author on two papers detailing the findings.

One group of pulsars combines incredible density with extreme rotation. The fastest of these so-called millisecond pulsars whirls at 43,000 revolutions per minute.

Millisecond pulsars are thought to achieve such speeds because they are gravitationally bound in binary systems with normal stars. During part of their stellar lives, gas flows from the normal star to the pulsar. Over time, the impact of this falling gas gradually spins up the pulsar's rotation.

The strong magnetic fields and rapid rotation of pulsars cause them to emit powerful beams of energy, from radio waves to gamma rays. Because the star is transferring rotational energy to the pulsar, the pulsar's spin eventually slows as the star loses matter.

Typically, millisecond pulsars are around a billion years old. However, in the Nov. 3 issue of Science, the Fermi team reveals a bright, energetic millisecond pulsar only 25 million years old.

The object, named PSR J1823−3021A, lies within NGC 6624, a spherical collection of ancient stars called a globular cluster, one of about 160 similar objects that orbit our galaxy. The cluster is about 10 billion years old and lies about 27,000 light-years away toward the constellation Sagittarius.

Fermi's Large Area Telescope (LAT) showed that eleven globular clusters emit gamma rays, the cumulative emission of dozens of millisecond pulsars too faint for even Fermi to detect individually. But that's not the case for NGC 6624.

"It's amazing that all of the gamma rays we see from this cluster are coming from a single object. It must have formed recently based on how rapidly it's emitting energy. It's a bit like finding a screaming baby in a quiet retirement home," said Paulo Freire, the study's lead author, at the Max Planck Institute for Radio Astronomy in Bonn, Germany.

J1823−3021A was previously identified as a pulsar by its radio emission, yet of the nine new pulsars, none are millisecond pulsars, and only one was later found to emit radio waves.

Despite its sensitivity, Fermi's LAT may detect only one gamma ray for every 100,000 rotations of some of these faint pulsars. Yet new analysis techniques applied to the precise position and arrival time of photons collected by the LAT since 2008 were able to identify them.

"We adapted methods originally devised for studying gravitational waves to the problem of finding gamma-ray pulsars, and we were quickly rewarded," said Bruce Allen, director of the Max Planck Institute for Gravitational Physics in Hannover, Germany. Allen co-authored a paper on the discoveries that was published online in *The Astrophysical Journal*.

Allen also directs the Einstein@Home project, a distributed computing effort that uses downtime on computers of volunteers to process astronomical data. In July, the project extended the search for gamma-ray pulsars to the general public by including Femi LAT data in the work processed by Einstein@Home users.

NASA's Fermi Gamma-ray Space Telescope is an astrophysics and particle physics partnership. It is managed by NASA's Goddard Space Flight Center in Greenbelt, Md. It was developed in collaboration with the U.S. Department of Energy, with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden and the United States.

For more information, images and animations, visit: http://www.nasa.gov/fermi

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http://www.sciencedaily.com/releases/2011/11/111103154626.htm

World unites to discuss internet freedoms and dangers

- Updated 10:15 02 November 2011 by **Niall Firth**

The whole world has finally decided to talk about the internet.

The London Conference on Cyberspace, the first international gathering of its kind, kicked off today, bringing together senior political figures from across the world and tech royalty such as Wikipedia founder Jimmy Wales.

Among the topics scheduled for discussion are how to ensure global access to the internet and dealing with net's darker elements: child safety, cybercrime and cyberwar.

Nations that try to restrict internet use, like China and some in the Middle East, particularly during times of peaceful uprisings, came in for harsh criticism.

"We reject the view that government suppression of the internet, phone networks and social media at times of unrest is acceptable," said UK foreign secretary William Hague.

People power

Underlining this point, Yemeni activist and blogger Atiaf Alwazir said: "Before the internet in Yemen, everything was controlled. This has changed: now we are in control.

"People say that Facebook and Twitter created the revolution," she added. "I disagree. People are the agents of change and the internet helped accelerate the process."

US vice-president Joe Biden made an explicit reference to demands from China and Russia for more international regulation of cyberspace: "What citizens do online should not, as some have suggested, be decreed solely by groups of governments making decisions for them somewhere on high."

He added: "No citizen of any country should be subject to a repressive global code."

Wales suggested that governments learn from Wikipedia's policy of openness.

http://www.newscientist.com/article/dn21110-world-unites-to-discuss-internet-freedoms-and-dangers.html?full=true&print=true

Humans and Climate Contributed to Extinctions of Large Ice Age Mammals, New Study Finds

The musk ox is one of the species studied by Beth Shapiro and her team. (Credit: Beth Shapiro lab, Penn State)

ScienceDaily (Nov. 2, 2011) — The genetic history of six large herbivores -- the woolly rhinoceros, woolly mammoth, wild horse, reindeer, bison, and musk ox -- has shown that both climate change and humans were responsible for the extinction or near extinction of large mammal populations within the last 10,000 years. The study, which is the first to use genetic, archeological, and climatic data together to infer the population history of large-bodied Ice Age mammals, will be published in the journal *Nature*.

The study was led by Professor Eske Willerslev of the Centre for GeoGenetics at the University of Copenhagen and includes an international team of paleontologists, geologists, geneticists and climate modelers including Beth Shapiro, the Shaffer Associate Professor of Biology at Penn State University. The study's findings are expected to shed light on the possible fates of living species of mammals as our planet continues its current warming cycle. The paper will be posted on the journal's Advance Online Publication website on 2 November 2011 at 2:00 p.m. U.S. Eastern time.

"Our findings put a final end to the single-cause theories of these extinctions," said Willerslev. "Our data suggest care should be taken in making generalizations regarding past and present species extinctions; the relative impacts of climate change and human encroachment on species extinctions really depends on which species we're looking at."

Shapiro explained that all six of the species the team studied flourished during the Pleistocene Epoch -- the period of geological time that lasted from about 2 million to 12,000 years ago. "During this time, there were lots of climatic ups and downs -- oscillations between long, warm intervals called interglacial periods, during which the climate was similar to what we have today, followed by long, cold intervals called glacial periods, or ice ages," Shapiro said. "Although these cold-adapted animals certainly fared better during the colder, glacial periods, they still managed to find places where the climate was just right -- refugia -- so that they could survive during the warmer, interglacial periods. Then, after the peak of the last ice age around 20,000 years ago, their luck started to run out. The question is, what changed? Why were these mammals no longer able to find safe refugia where they could survive in a warm climate?"

To answer these questions, the team collected many different types of data to test hypotheses about how, when, and why the woolly rhinoceros, woolly mammoth, and wild horse all went extinct after the last ice age, and why the reindeer, bison, and musk ox were able to survive -- albeit in much more restricted ranges than they could inhabit during the ice ages. "One source of information we used was DNA from the animals themselves," Shapiro explained. "With genetic data, it's possible to estimate when and how much populations were able to grow and shrink as the climate changed and their habitat started to disappear." The team also

collected climatic data -- temperature and precipitation patterns -- from both glacial and interglacial periods, as well as archeological data, which they used to study the extent to which early humans may have influenced the survival of these six mammal species. "For example, in locations where animal bones had been cooked or converted into spears, we know that humans lived there and were using them as a resource," Shapiro said. "Even where we don't find evidence that humans were using the animals, if humans and the animals lived in the same place and at the same time, humans could have had some influence on whether the animals survived or not."

In the case of the now-extinct woolly rhinoceros, the scientists found that, in Europe, the ranges of humans and woolly rhinoceros never overlapped. "These data suggest that climate change, and not humans, was the main reason why this particular species went extinct in present-day Europe," Shapiro said. "Still, we expect humans might have played a role in other regions of the world where they did overlap with woolly rhinos, and so further studies will be necessary to test this hypothesis." Much clearer was the evidence that humans did influence, and not always negatively, the population sizes of the five other species -- the woolly mammoth, wild horse, reindeer, bison, and musk ox.

Shapiro explained that population fluctuations for all six species continued until the end of the last ice age -- around 14,000 years ago -- when many of the species simply disappeared. "The take-home message is that during the most recent warming event, when the last ice age faded into the warm interval we have today, something kept these animals from doing what they had always done, from finding alternative refugia -- less-than-ideal, but good-enough chunks of land on which to keep their populations at a critical mass," Shapiro said. "That 'something' was probably us -- humans." During the period when these animals were declining, the human population was beginning its boom, and was spreading out across not only the large-bodied mammals' cold-climate habitats, but also across their warm-climate refuges, changing the landscape with agriculture and other activities. Many large-bodied, cold-adapted mammals, including the horse -- which is considered extinct in the wild and now survives only as a domesticated animal -- suddenly had no alternative living spaces, and, as such, no means to maintain their populations.

"The results of our study suggest that although past warm periods caused these animal species to go through periodic bottlenecks -- evolutionary events during which the size of a population diminishes substantially and stays small for a long time -- they always seemed to bounce back, and to return to their previous habitats as soon as the Earth became cooler again. Then, during the most-recent warming cycle, that trend changed," Shapiro said.

As the climate became warmer after the last ice age, the woolly rhinoceros, woolly mammoth, and wild horse became extinct, and the reindeer, bison, and musk ox may have just been fortunate in avoiding extinction, according to Shapiro. "We couldn't pinpoint what patterns characterize extinct species, despite the large and varying amount of data analyzed," said Eline Lorenzen, from the University of Copenhagen and the first author of the study. "This suggests that it will be challenging for experts to predict how existing mammals will respond to future global climate change -- to predict which species will go extinct and which will survive."

Reindeer managed to find safe habitat in high arctic regions and, today, have few predators or competitors for limited resources. Bison are extinct in Asia, where their populations were extensive during the ice ages, and today they are found only in North America, although a related species survives in small numbers in Europe. Cold-adapted muskoxen now live only in the arctic regions of North America and Greenland, with small introduced populations in Norway, Siberia, and Sweden. Interestingly, if humans had any impact on musk-ox populations, it may have been to help sustain them. Musk-ox populations first became established in Greenland around 5,000 years ago, after which they expanded rapidly, despite having been a major resource for the Paleo-Eskimo population. Today, the animal species survives in large numbers.

Shapiro also said that the findings could help to predict the fate of populations threatened by the climate change and habitat alteration that is happening today. "Our results provide direct evidence that something changed between the most-recent glacial cycle, when many of these species went extinct, and previous glacial cycles, through which they all managed to survive. Although it is clear that climate change drives the dynamics of these species, we, as humans, have to take some of the blame for what happened during this most-recent cycle. It seems that our ancestors were able to change the landscape so dramatically that these animals were effectively cut off from what they needed to survive, even when the human population was small," Shapiro said. "There are many more humans today, and we have changed and are continuing to change the planet in even more important ways."

In addition to Shapiro, Willerslev and Lorenzen, many other scientists contributed to this study. In the United States, contributing authors are from institutions in Utah, California, Texas, Missouri, Maryland, Colorado, Massachusetts, Oregon, and Kansas. The study's international contributors are from institutions in Denmark, Australia, Sweden, Spain, the United Kingdom, the Netherlands, Germany, Norway, Russia, China, and Canada.

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http://www.sciencedaily.com/releases/2011/11/111102161041.htm

Brain-training games stop depression before it starts

- 11:00 01 November 2011 by **Justin Warner**

It may be possible to stave off depression before it even appears using brain-training software so simplistic in its design that even the psychologist testing it once bet it wouldn't work.

Ian Gotlib's group at Stanford University, California, studies girls aged 10 to 14 years whose mothers suffer from depression. Such girls are thought to be at higher-than-normal risk of developing the condition themselves, in part because they may inherit their mothers' tendency to "amplify" unpleasant information. Although none of the girls has yet experienced a depressive episode, Gotlib has found that their brains already overreact to negative emotional stimuli – a pattern they share with their mothers and other depressed people.

Gotlib is studying whether these young subjects can use interactive software and brain-imaging hardware to "rewire" their brains by unlearning this negative bias. In a pilot experiment, eight girls used a neural feedback display to learn how to control activity in a network of interrelated brain regions that have been linked to depression – these include the dorsal anterior cingulate cortex, anterior insula and dorsolateral prefrontal cortex.

The level of activity in this network was measured using an functional MRI scan and displayed to the girls in the form of a thermometer on a computer screen. The girls were shown sad or negative pictures that might ordinarily raise their "temperature", and tried to lower that "temperature" by adopting more sanguine mental states. They were then advised to try to recreate that mindset in their daily lives.

A control group unknowingly watched someone else's scan output instead of their own, so they didn't actually learn how to control their brain activity.

Accentuate the positive

Another set of girls in the pilot experiment received their training through a simple computer game instead. In this game, a pair of faces appeared on a screen every few seconds: they would be either neutral and sad, or neutral and happy. Then a dot replaced one of the faces, and the "game" was to click on the dot. For the eight girls in the control group, the face replaced by the dot was selected at random, but for eight girls in the experimental group, the dot always replaced the more positive face in the pair. Over a week of playing this game daily, these girls were in effect being trained to avoid looking at the sad faces.

Gotlib himself originally found this concept, called attentional-bias training, so simplistic that he bet Colin MacLeod, a psychologist at the University of Western Australia in Perth who pioneered the technique, that it would not alter psychological symptoms. Gotlib lost his bet.

In his pilot study, both kinds of training significantly reduced stress-related responses – for example, increases in heart rate, blood pressure and cortisol levels – to negative stimuli. These stress responses are a key marker of depression, and they diminished one week after training. The girls in the experimental groups also developed fewer defensive responses to negative faces, such as startled blinking. Control groups showed no such improvement.

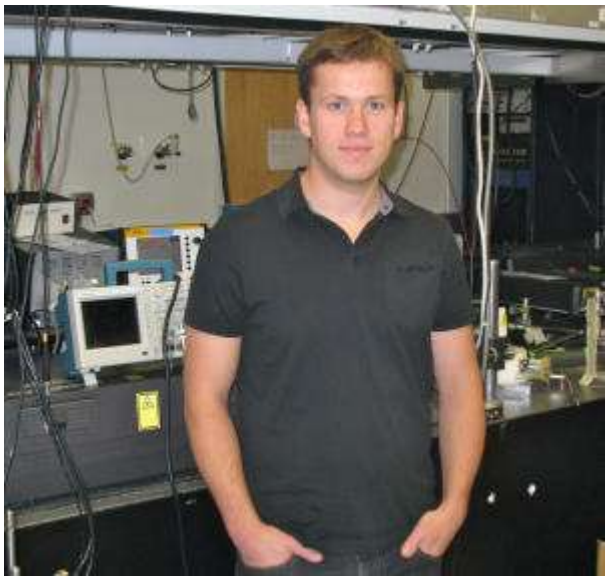
Jill Hooley, head of Harvard University's clinical psychology programme, was impressed by the findings despite the small sample size: "This is highly innovative work," she said. "Ian is breaking new ground here."

Gotlib is adding more subjects to the training programme and plans to compare their long-term mental health with a parallel cohort of 200 girls, half of whom have depressed mothers, who aren't participating in the study.

He presented his results at the annual meeting of the Society for Research in Psychopathology in Boston in September.

http://www.newscientist.com/article/dn20707-braintraining-games-stop-depression-before-it-starts.html

Physicists Identify Room Temperature Quantum Bits in Widely Used Semiconductor



William Koehl (Credit: George Foulsham, Office of Public Affairs, UCSB)

ScienceDaily (Nov. 2, 2011) — A discovery by physicists at UC Santa Barbara may earn silicon carbide -- a semiconductor commonly used by the electronics industry -- a role at the center of a new generation of information technologies designed to exploit quantum physics for tasks such as ultrafast computing and nanoscale sensing.

The research team discovered that silicon carbide contains crystal imperfections that can be controlled at a quantum mechanical level. The finding is published this week in the journal *Nature.*

The research group of David Awschalom, senior author, made the finding. Awschalom is director of UCSB's Center for Spintronics & Quantum Computation, professor of physics, electrical and computer engineering, and the Peter J. Clarke Director of the California NanoSystems Institute.

In conventional semiconductor-based electronic devices, crystal defects are often deemed undesirable because of their tendency to immobilize electrons by "trapping" them at a particular crystal location. However, the UCSB team discovered that electrons that become trapped by certain imperfections in silicon carbide do so in a way that allows their quantum states to be initialized, precisely manipulated, and measured using a combination of light and microwave radiation. This means that each of these defects meets the requirements for use as a quantum bit, or "qubit," which is often described as the quantum mechanical analog of a transistor, since it is the basic unit of a quantum computer.

"We are looking for the beauty and utility in imperfection, rather than struggling to bring about perfect order," said Awschalom, "and to use these defects as the basis for a future quantum technology."

Most crystal imperfections do not possess these properties, which are intimately tied to the atomic structure of a defect and the electronic characteristics of its semiconductor host, explained Awschalom. In fact, before this research, the only system known to possess these same characteristics was a flaw in diamond known as the nitrogen-vacancy center.

The diamond nitrogen-vacancy center is renowned for its ability to function as a qubit at room temperature, while many other quantum states of matter require an extremely cold temperature, near absolute zero. However, this center exists in a material that is difficult to grow and challenging to manufacture into integrated circuits.

In contrast, high-quality crystals of silicon carbide, multiple inches in diameter, are commonly produced for commercial purposes. They can be readily fashioned into a multitude of intricate electronic, optoelectronic, and electromechanical devices. In addition, the defects studied by Awschalom and his group are addressed using infrared light that is close in energy to the light used widely throughout modern telecommunications networks. And while several distinct defect types were studied at a range of temperatures, two of them were capable of room temperature operation, just like the diamond nitrogen-vacancy center.

The combination of these features makes silicon carbide, with its defects, an attractive candidate for future work seeking to integrate quantum mechanical objects with sophisticated electronic and optical circuitry, according to the researchers. This research fits within a wider effort at UCSB to engineer quantum devices by fostering collaboration between the fields of materials science and quantum physics.

While defects in silicon carbide may offer many technologically attractive qualities, an immense number of defects in other semiconductors are still left to be explored.

"Our dream is to make quantum mechanics fully engineerable," said William Koehl, lead author and a graduate student in the Awschalom lab. "Much like a civil engineer is able to design a bridge based on factors such as load capacity and length span, we'd like to see a day when there are quantum engineers who can design a quantum electronic device based on specifications such as degree of quantum entanglement and quality of interaction with the surrounding environment."

Story Source:

The above story is reprinted from materials provided by **University of California - Santa Barbara**.

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http://www.sciencedaily.com/releases/2011/11/111102161257.htm

Smarter cameras help you take slicker snaps

- 28 October 2011 by **Jacob Aron**
- Magazine issue 2835.

Child's play *(Image: Patrik Engström/Folio Images/plainpicture)*

DIGITAL cameras mean you no longer get stuck with a film roll full of blurry, under-exposed holiday snaps. Sadly, they don't stop you from taking bad photos in the first place. Wouldn't it be nice if your camera could also make you a better photographer?

Modern digital cameras like those found on smartphones often come with helpful tools such as face detection, yet it is still all too easy to make a mess of a picture. "A lot of the interaction with a phone camera is very similar to the interaction you had with a film camera 30 years ago," says Stephen Brewster, a researcher in human-computer interaction at the University of Glasgow, UK, He is developing a new camera interface to help get pictures right first time.

The interface uses the sensors and processing power found in smartphones to provide photographers with more information before they click. For example, accelerometers can detect that an image is aligned with the horizon or when your hands are shaking. The phone can then warn you with guidelines on the screen, audio cues or vibration. Brewster's team has also extended the face detection found in some smartphone cameras to help you frame arms-length self-portraits with friends - useful if your smartphone only has one built-in camera. When you point it towards yourself you can't see the screen, but the phone will vibrate once for each face it has in its sights.

For other photos, guidelines are summarised by a traffic-light system that lets you know the quality of a shot before you take it - a red or amber light means you might want to recompose, while a green light helps ensure a decent picture. This is important because people simply delete bad photos, says Brewster. "You've got to get it right first time because the event has gone, and if you've got a really bad photo, you've lost it."

Brewster, who will present his system at the Electronic Imaging conference in San Francisco in January, says he is in talks with a major camera manufacturer about incorporating some of his ideas into their products. He also plans to release a version of the interface as an Android app by the end of the year.

Even with extra help, smartphones can never match the images afforded by a professional digital camera with a high quality lens. But photographers with these more advanced cameras face another problem - the

balancing act between a photo's exposure time and its depth of field (DoF), or how much of the shot is in focus.

Photos taken with a small aperture have a large DoF, meaning more of the frame is in focus, but less light gets into the camera. This means it takes longer to achieve the correct exposure and can lead to a blurry photo if the subject is in motion. Using a larger aperture solves that problem but narrows the focus, blurring the background or foreground.

Now Sam Hasinoff, a software engineer at Google, has a solution that gives photographers the best of both worlds. He takes multiple wide-aperture photos with different DoFs and combines them to create a picture with a DoF equivalent to a small-aperture photo but taken in a fraction of the time, since the wider aperture reaches the correct exposure level much faster. His method, called light efficient photography, automatically calculates which combination of photos will produce the desired picture for a selected exposure (*IEEE Transactions on Pattern Analysis and Machine Intelligence*, DOI: 10.1109/TPAMI.2011.62).

"If either the scene or camera is moving, our method will record less motion blur, leading to a sharper and more pleasing photo," says Hasinoff. It also makes it possible to capture low-light scenes with a large DoF, which is often challenging.

Hasinoff thinks it should be possible to implement his method in existing cameras, but some processing techniques still require the number-crunching power of a PC. Earlier this month, Adobe, which makes Photoshop, gave attendees of its MAX conference in Los Angeles a sneak preview of a tool that can unblur digital photos. It examines the image to calculate the movement of the photographer that led to blurring, then computationally reverses the motion to clear up the photo.

Sensor data from your smartphone or camera could improve the technique. "You can use that to help deblur the photo as well because you know lots about how the camera was moving," says Brewster. Future cameras could boast all of these methods, performing both pre and post-processing to give you the best possible photo. "That would be the perfect solution."

3D photos from a single lens

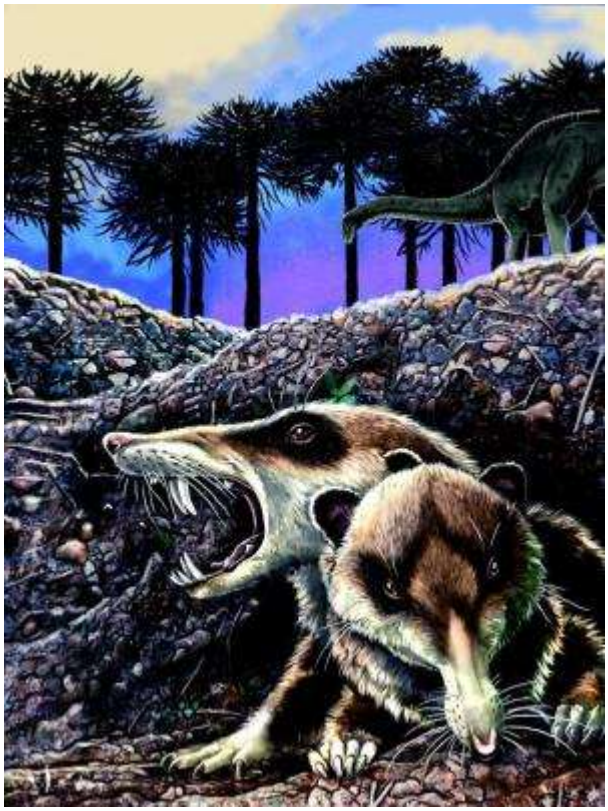
Advances in camera software might help you take a better photo, but hardware advances offer new kinds of photos altogether. Electrical engineer Alyosha Molnar and his team at Cornell University in Ithaca, New York, are working on a sensor that could capture 3D pictures using just a single lens.

It uses pixels that detect both the intensity of light and the angle at which it hits the sensor. Regular digital camera sensors only detect intensity, which is why today's 3D cameras need two lenses to collect the angle information as well. This can lead to small errors in the image.

Molnar's sensor only has around 0.15 megapixels, but he says the image quality should be comparable to normal cameras once it is scaled up.

http://www.newscientist.com/article/mg21228356.000-smarter-cameras-help-you-take-slicker-snaps.html?full=true&print=true

'Saber-Toothed Squirrel': First Known Mammalian Skull from Late Cretaceous in South America



Artist's depiction of Cronopio dentiacutus. (Credit: Illustration by Jorge Gonzalez)

ScienceDaily (Nov. 2, 2011) — Paleontologist Guillermo Rougier, Ph.D., professor of anatomical sciences and neurobiology at the University of Louisville, and his team have reported their discovery of two skulls from the first known mammal of the early Late Cretaceous period of South America. The fossils break a roughly 60 million-year gap in the currently known mammalian record of the continent and provide new clues on the early evolution of mammals.

Details of their find are published Nov. 3 in Nature. Co-authors are Sebastián Apesteguía of Argentina's Universidad Maimónides and doctoral student Leandro C. Gaetano.

The new critter, named *Cronopio dentiacutus* by the paleontologists, is a dryolestoid, an extinct group distantly related to today's marsupials and placentals.

"Dr. Rougier and his colleagues truly have made an outstanding discovery of the first really informative skull remains belonging to a key mammalian group," said Rich Cifelli, Ph.D., Presidential Professor of Zoology at the University of Oklahoma and a researcher who, like Rougier, has spent his career discovering and identifying mammal remains.

"The discovery of Cronopio is especially notable because it provides for the first time the whole cranial morphology (form and structure) of a dryolestoid," writes Christian de Muizon, director of the Muséum National d'Histoire Naturelle in Paris in a "News and Views" article in the same issue of Nature.

Cronopio was shrew-sized, about 4-6 inches in length, and was an insectivore with a diet of the insects, grubs and other bugs of the time. It lived when giant dinosaurs roamed Earth -- more than 100 million years ago -- and made its home in a vegetated river plain.

The skulls reveal that Cronopio had extremely long canine teeth, a narrow muzzle and a short, rounded skull. "These first fossil remains of dryolestoids … give us a complete picture of the skull for the group," John R. Wible, Ph.D., curator of mammals at the Carnegie Museum of Natural History, said. "The new dryolestoid, Cronopio, is without a doubt one of the most unusual mammals that I have seen, extinct or living, with its elongate, compressed snout and oversized canine teeth. What it did with that unusual morphology perhaps may come to light with additional discoveries… ."

Rougier describes Cronopio in a manner that fans of a popular animated movie series can easily understand.

"It looks somewhat like Scrat, the saber-toothed squirrel from 'Ice Age,' " he said.

Cartoon references aside, Rougier, Apesteguía and Gaetano realized almost immediately the importance of the discovery when they located the fossils in 2006 because mammalian skulls are very fragile, small and rarely found.

The skulls were embedded in rock in a remote area of northern Patagonia, about 100 miles from the city of Allen in the Argentinian province of Rio Negro. Removal of the specimens from the rocks encasing them took several years of patient lab work, which eventually confirmed that the skulls were the first of their kind found.

"We knew it was important, based on the age of the rocks and because we found skulls," Rougier said. "Usually we find teeth or bone fragments of this age. Most of what we know of early mammals has been determined through teeth because enamel is the hardest substance in our bodies and survives well the passage of time; it is usually what we have left to study.

"The skull, however, provides us with features of the biology of the animal, making it possible for us to determine this is the first of its kind dating to the early Late Cretaceous period in South America," he said. "This time period in South America was somewhat of a blank slate to us. Now we have a mammal as a starting point for further study of the lineage of all mammals, humans included."

The prospects for further investigation are exciting. "In recent years it has become clear that southern continents hosted their own endemic groups of mammals during the Age of Dinosaurs. But until now, all we have had are isolated teeth and a few jaw fragments … which don't really help much in deciphering broader relationships," Cifelli said. "For this reason, the new fossils provide a sort of Rosetta Stone for understanding the genealogy of early South American mammals, and how they fit in with those known from northern landmasses. Now the burden is on the rest of us to find similarly well preserved fossils from elsewhere, so that the broader significance of Rougier's finds can be fully placed in context."

In addition to conducting research, Rougier teaches anatomy to UofL School of Medicine students and said the discovery extends the knowledge of our lineage.

"This tells us a little more of the full history of our lineage, a very resilient lineage," he said. "Cronopio lived in a completely different world than ours, dominated by dinosaurs and with a different geography; these new fossils give us information on how transient and ever-evolving our world is."

Rougier, a native Argentinian, earned his doctorate at Universidad de Buenos Aires and joined the UofL faculty in 1998 following work at the American Museum of Natural History in New York and Museo

Argentino de Ciencias Naturales in Buenos Aires. Funding to support his work came from the National Science Foundation, the Antorchas Foundation and the American Museum of Natural History.

Story Source:

The above story is reprinted from materials provided by **University of Louisville**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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1. Guillermo W. Rougier, Sebastián Apesteguía, Leandro C. Gaetano. **Highly specialized mammalian skulls from the Late Cretaceous of South America**. *Nature*, 2011; 479 (7371): 98 DOI: 10.1038/nature10591

http://www.sciencedaily.com/releases/2011/11/111102161050.htm

Thawing microbes could control the climate

- 18:00 06 November 2011 by **Michael Marshall**

The tundra is awakening *(Image: Steven Kazlowski/Science Faction/Getty)*

As the Arctic permafrost melts over the coming decades, long-frozen microorganisms will thaw out and start feasting on the soil. The first have already begun to wake up – and early signs are that they will have a major impact on how Earth's climate changes.

As the Arctic permafrost thaws, runaway global warming may ensue, because the huge amounts of organic carbon the permafrost contains will escape into the atmosphere.

To find out how the permafrost's microorganisms will respond to a thaw, Janet Jansson of the Lawrence Berkeley National Laboratory in Berkeley, California, and colleagues collected three cores from permafrost soil in central Alaska. Back in the lab, they thawed samples of each core and kept them at 5 °C. For the first two days the melting ice released lots of methane that had been trapped when it formed, but the rate then quickly dropped.

That's because soil microorganisms thawed out, and although some began making methane that added to the emissions, others consumed it and converted it into carbon dioxide instead. "It's a very rapid response," Jansson says. Her team took samples of DNA from the permafrost as it warmed up, allowing them to track how the microbial population changed.

Many studies have examined the gases that escape from thawing permafrost, but we knew little about how the microbes within influence the process, says Torben Christensen of Lund University in Sweden. The permafrost ecosystem is almost entirely unexplored. "Most of the microorganisms in permafrost have never been cultivated, and more than 90 per cent are unidentified," Jansson says.

Chilly microbes

Methane is a stronger greenhouse gas than CO_2, although it does not stay in the atmosphere as long. Jansson says a release of CO_2 is still bad news, but preferable to methane.

It's long been known that methane-munching microorganisms will get to work in thawing permafrost, Christensen says. "At least 50 per cent of the gross production of methane will be oxidised." In other words, consumed.

The question is, will the methane-eaters be able to consume the bulk of the gas once the permafrost starts melting in a big way? Christensen says that will depend on what happens to the water table. Higher water tables mean more methane and fewer microorganisms to eat it, while lower water tables mean the opposite.

No laughing matter

Also adding to our worries are indications that thawing permafrost may release large quantities of nitrous oxide – aka laughing gas – which is an even more powerful greenhouse gas than methane, and damages the ozone layer into the bargain.

As the team's permafrost samples thawed they saw no boost in the levels of microbes that produce nitrous oxide reductase, an enzyme that converts nitrous oxide into harmless nitrogen. Without this boost, the nitrous oxide could escape.

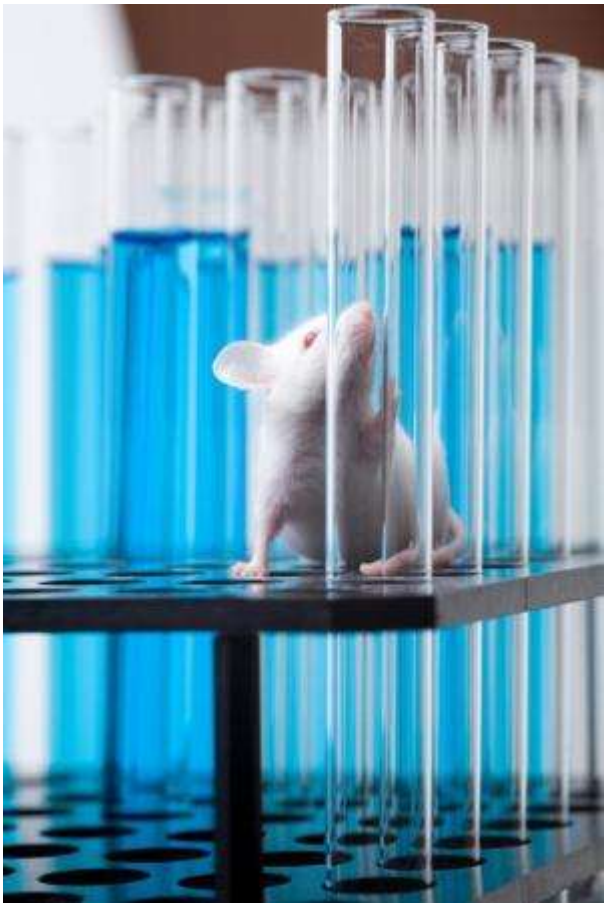
Christensen has set up a monitoring system to track greenhouse gas emissions from thawing permafrost, and is increasingly tracking nitrous oxide as well as CO_2 and methane. "It may be a player," he says.

Journal reference: *Nature*, DOI: 10.1038/nature10576

http://www.newscientist.com/article/dn21130-thawing-microbes-could-control-the-climate.html?full=true&print=true

Tactic to Delay Age-Related Disorders

Laboratory mouse. (Credit: iStockphoto)



ScienceDaily (Nov. 2, 2011) — Researchers at Mayo Clinic have shown that eliminating cells that accumulate with age could prevent or delay the onset of age-related disorders and disabilities. The study, performed in mouse models, provides the first evidence that these "deadbeat" cells could contribute to aging and suggests a way to help people stay healthier as they age.

The findings appear in the journal *Nature*, along with an independent commentary on the discovery.

"By attacking these cells and what they produce, one day we may be able to break the link between aging mechanisms and predisposition to diseases like heart disease, stroke, cancers and dementia," says co-author James Kirkland, M.D., Ph.D., head of Mayo's Robert and Arlene Kogod Center on Aging and the Noaber Foundation Professor of Aging Research. "There is potential for a fundamental change in the way we provide treatment for chronic diseases in older people."

Five decades ago, scientists discovered that cells undergo a limited number of divisions before they stop dividing. At that point the cells reach a state of limbo -- called cellular senescence -- where they neither die nor continue to multiply. They produce factors that damage adjacent cells and cause tissue inflammation. This alternative cell fate is believed to be a mechanism to prevent runaway cell growth and the spread of cancer. The immune system sweeps out these dysfunctional cells on a regular basis, but over time becomes less effective at "keeping house."

As a result, senescent cells accumulate with age. Whether and how these cells cause age-related diseases and dysfunction has been a major open question in the field of aging. One reason the question has been so difficult to answer is that the numbers of senescent cells are quite limited and comprise at most only 10 to 15 percent of cells in an elderly individual.

"Our discovery demonstrates that in our body cells are accumulating that cause these age-related disorders and discomforts," says senior author Jan van Deursen, Ph.D., a Mayo Clinic molecular biologist and the Vita Valley Professor of Cellular Senescence. "Therapeutic interventions to get rid of senescent cells or block their effects may represent an avenue to make us feel more vital, healthier, and allow us to stay independent for a much longer time."

"Through their novel methodology, the research team found that deletion of senescent cells in genetically engineered mice led to improvement in at least some aspects of the physiology of these animals. So, with the caveat that the study involved a mouse model displaying accelerated aging, this paper provides important

insights on aging at the cellular level," says Felipe Sierra, Ph.D., Director of the Division of Aging Biology, National Institute on Aging, National Institutes of Health.

How They Did It

Dr. van Deursen and colleagues genetically engineered mice so their senescent cells harbored a molecule called caspase 8 that was only turned on in the presence of a drug that has no effect on normal cells. When the transgenic mice were exposed to this drug, caspase 8 was activated in the senescent cells, drilling holes in the cell membrane to specifically kill the senescent cells.

The researchers found that lifelong elimination of senescent cells delayed the onset of age-related disorders such as cataracts and muscle loss and weakness. Perhaps even more importantly, they showed that removing these cells later in life could slow the progression of already established age-related disorders.

The findings support a role of senescent cells in the aging process and indicate that chemicals secreted by these cells contribute to age-related tissue dysfunction and disease.

Other co-authors of the article are: Darren Baker, Ph.D., Tamar Tchkonia, Ph.D., Nathan LeBrasseur, Ph.D. and Bennett Childs, all of Mayo Clinic; and Tobias Wijshake and Bart van de Sluis, Ph.D., both of Groningen University, The Netherlands. The Ellison Medical Foundation, the Noaber Foundation, the Robert and Arlene Kogod Center on Aging, and the National Institutes of Health funded the study.

Story Source:

The above story is reprinted from materials provided by **Mayo Clinic**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/11/111102161056.htm

Visit to the coral gardeners' seabed lab

- 04 November 2011 by **Erica Gies**, The seabed, Florida Keys
- Magazine issue 2837.

Just another day in the office *(Image: NASA Extreme Environment Missions Operations)*

I DRIFT weightlessly down the anchor line, through water churned turbid by a recent storm. Twenty metres beneath the surface, Aquarius Reef Base hunkers on the seabed.

A research lab like no other, the 14-metre-long horizontal cylinder sleeps six and is linked to the surface via tubes that supply air, communications and power. Teams can spend up to 14 days living underwater, in a pressurised environment. That allows training NASA astronauts (pictured below) to experience a hostile environment where they depend on life-support systems. And it offers biologists an unmatched opportunity to research the coral ecosystems nearby.

Schoolmaster fish cluster in the base's crevices, peering at me wide-eyed. I peek in through portholes at instrument panels, stacked bunks and the mess, stocked with Pringles. Through another, I make out near-naked bodies: aquanauts have arrived in the entry bay and are drying off in their swimsuits. Their lab is the surrounding Florida Keys National Marine Sanctuary, a jewel of marine biodiversity that is in rapid decline as a result of overfishing, pollution run-off, injuries from careless boats, warming seas and ocean acidification.

Billy Causey, regional director for the sanctuary, has been diving here since 1968. "I have seen enormous change in the abundance of corals, the health of the corals, and the variety of species of corals in some areas," he says. These changes inspired Ken Nedimyer to undertake what is perhaps the world's most ambitious marine-conservation restoration project.

Nedimyer is president of the non-profit Coral Restoration Foundation, based in Tavernier, Florida. On a sandy seabed near the lab, he has started an unusual nursery where staghorn corals (*Acropora cervicornis*) grow suspended from stands that resemble artificial Christmas trees.

In 2003 Nedimyer got permission from the sanctuary to test transplants from his nursery on part of a reef that a boat had damaged. That reef now features more staghorn, but it's unclear to what extent other creatures in

the ecosystem have returned. Still, the results were encouraging enough to kick-start similar projects. Margaret Miller of the US National Marine Fisheries Services now leads an experiment out of Aquarius that is comparing the success of corals that are planted out from the nursery with others grown in an aquarium, or collected and transplanted from two wild sites.

Coral restoration isn't unique to Florida, but what's happening here is arguably the most scientifically rigorous effort. "This is the only restoration project I know where they've genotyped the types of corals," says Andrew Baker of the University of Miami, Florida. The genetic sequencing revealed that within species, some strains are more resistant to threats than others, and Baker says the aim of the restoration projects is to try to increase the abundance of these hardier genotypes.

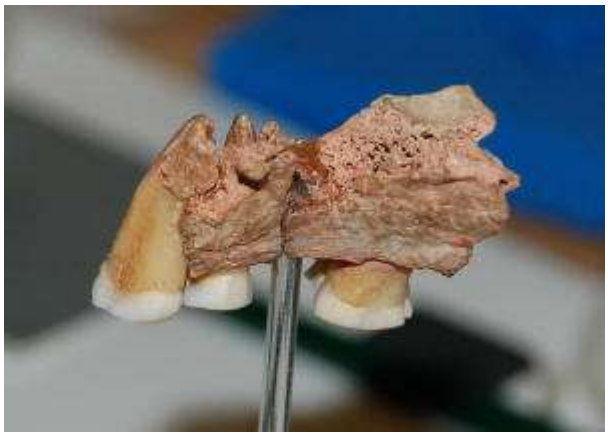
The variety of threats that corals face make the prospect of genotype selection a difficult one, and it is important to maintain as many genotypes as possible in any restoration effort. While slower-growing genotypes might seem less promising, says Miller, "we need to pay special attention to the runts. They might have some other resistance that we haven't recognised yet." Without a station like Aquarius, this sort of underwater farming research would be impossibly slow. Teams would be limited to a couple of hours of diving every day, instead of 9 hours during each day on Aquarius, and data would be sparse. The difference is like taking a photograph versus shooting video, says Causey.

In April, Nedimyer applied to the sanctuary for a full-scale restoration permit, which is still under review. Baker, Miller and Causey are all proponents of assisting coral adaptation, having seen how quickly the ecosystem has declined. The fact that some areas under consideration for restoration have lost all of some native coral species minimises concerns such as introducing disease vectors.

Work on Aquarius has so far given valuable insights into the physiology of corals and their symbiotic algae, the effects of herbivorous fish on coral growth, and the resistance of sponges to higher temperatures and levels of carbon dioxide. This and Nedimyer's coral farms could help Florida's unique marine ecosystems adapt more quickly to human-created threats, setting an example for other coral-reef restoration projects around the planet.

http://www.newscientist.com/article/mg21228374.200-visit-to-the-coral-gardeners-seabed-lab.html?full=true&print=true

Jawbone Found in England Is from the Earliest Known Modern Human in Northwestern Europe



A photograph of the maxilla including three teeth, of the earliest known modern human in Europe, discovered during excavations at Kent's Cavern, Devon, England, in 1927. (Credit: Chris Collins (NHM) and Torquay Museum)

ScienceDaily (Nov. 2, 2011) — A piece of jawbone excavated from a prehistoric cave in England is the earliest evidence for modern humans in Europe, according to an international team of scientists. The bone first was believed to be about 35,000 years old, but the new research study shows it to be significantly older -- between 41,000 and 44,000 years old, according to the findings that will be published in the journal Nature. The new dating of the bone is expected to help scientists pin down how quickly the modern humans spread across Europe during the last Ice Age. It also helps confirm the much-debated theory that early humans coexisted with Neanderthals.

Beth Shapiro, the Shaffer Associate Professor of Biology at Penn State University and a member of the research team, explained that the fragment of maxilla -- the upper jaw -- containing three teeth was unearthed in 1927 in a prehistoric limestone cave called Kent's Cavern in southwestern England. Records from the original excavations, undertaken by the Torquay Natural History Society located in Devon, England, indicate that the jawbone was discovered 10 feet 6 inches beneath the surface and was sealed by stalagmite deposits. "In 1989, scientists at Oxford University dated the bone as being about 35,000 years old. However, doubts were later raised about the reliability of the date because traces of modern glue, which was used to conserve the bone after discovery, were found on the surface," Shapiro said. "We knew we were going to have to do additional testing to re-date the bone." Because the remaining uncontaminated area of bone was deemed too small to re-date, the research team searched through the excavation archives and collections in the Torquay Museum to obtain samples of other animal bones from recorded depths both above and below the spot where the maxilla was found.

Members of the research team then obtained radiocarbon dates for the bones of wolf, deer, cave bear, and woolly rhinoceros, all of which were found close to the maxilla, and all of which could be dated at between 50,000 and 26,000 years old. Using a Bayesian statistical-modelling method, the scientists then were able to calculate an age for the maxilla. The new date indicates that the bone is between 41,000 and 44,000 years old.

Tom Higham, Deputy Director of Oxford University's Radiocarbon Accelerator Unit and a member of the research team, said: "Radiocarbon dating of ancient bones is very difficult to do. Because the initial date from this fragment of jawbone was affected by traces of modern glue, the initial measurement made in 1989 was too young. The new dating evidence we have obtained allows us, for the first time, to pinpoint the real age of this key specimen. We believe this piece of jawbone is the earliest direct evidence we have of modern humans in northwestern Europe."

Shapiro explained that the new and more-accurate date is especially important because it provides clearer evidence about the coexistence of Neanderthals and anatomically modern humans. "If the jawbone is, in fact, 41,000 to 44,000 years old, that means it was from a time when Neanderthals were still present in Europe, so we first had to confirm that the bone was from an anatomically modern human, and not a Neanderthal," Shapiro said. Shapiro and her team first tried to extract mitochondrial DNA from one of the teeth, but there were insufficient amounts for valid DNA sequencing. Eventually, team members were able to use a virtual three-dimensional model based on a CT scan of the jawbone to carry out a detailed analysis of the fossil. They compared the external and internal shapes of the teeth with those of modern human and Neanderthal fossils from a number of different sites. They found early modern human characteristics in all but three of the 16 dental characteristics.

Studies of the maxilla have been under way for the last decade, but it was only with the application of the latest investigative and dating techniques that the research team was able to make this breakthrough in identifying the jawbone as the earliest modern human so far known from Europe.

"Comparative data were lacking for some of the traits our team was studying," Shapiro said. "So, thankfully, our team member Tim Compton of the Natural History Museum in England helped by building a completely new database to help discriminate modern features from Neanderthal features. While the dominant characteristics are certainly modern, there are some that are ambiguous, or that fall into the Neanderthal range." The research team believe that these ambiguous features may reflect inadequate sampling of modern human variation, shared primitive features between early modern humans and Neanderthals, or even interbreeding between the two species. "We'll have to delve a little deeper and do more work to resolve these questions," Shapiro said.

Another exciting feature of the new study is that it could help solve the apparent discrepancy about the known dates of the Aurignacian period -- a time of cultural development in Europe and southwest Asia that lasted from around 45,000 to 35,000 years ago. Previous researchers have discovered artefacts and tools from this period that are thought to have been produced by the earliest modern humans in Europe. However, strangely, these artifacts have been found to be much older than the rare skeletal remains found in the same vicinity. While Aurignacian tools and ornaments have been dated at as old as 44,000 years, tests to pinpoint the age of relevant human remains have resulted in dates that reach no further than between 41,000 and 39,000 years ago, indicating a significant gap.

"The new date and identification of this bone from Kent's Cavern is very important, as we now have direct evidence that modern humans were in northwest Europe about 42,500 years ago," Higham said. "It confirms the presence of modern humans at the time of the earliest Aurignacian culture, and tells us a great deal about the dispersal speed of our species across Europe during the last Ice Age. It also means that early humans coexisted with Neanderthals in this part of the world, something that a number of researchers have doubted."

In addition to Shapiro, Higham, and Compton, other members of the research team include Chris Stringer, Roger Jacobi, and Chris Collins of the Natural History Museum in the United Kingdom; Erik Trinkaus of Washington University in the United States; Barry Chandler of the Torquay Museum in the United Kingdom; Flora Gröning, Paul O'Higgins, and Michael Fagan of the University of Hull in the United Kingdom; Simon Hillson of University College London in the United Kingdom; and Charles FitzGerald of McMaster University in Canada.

The research was funded by two organizations in the United Kingdom: the Leverhulme Trust, established at the wish of William Hesketh Lever, the first Viscount Leverhulme, and the Natural Environment Research Council.

Story Source:

The above story is reprinted from materials provided by **Penn State, Eberly College of Science**. The original article was written by Maria Coyle and Katrina Voss.

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http://www.sciencedaily.com/releases/2011/11/111102161058.htm

Dust bowl looms if US Southwest drought plans fail

- Updated 13:46 02 November 2011 by **Peter Aldhous**
- Magazine issue 2836.

The dry heart of Texas *(Image: Eric Gay/AP/PA)*

1 more image

THEY like their beef in Texas. So when Texan ranchers started offloading their cattle at bargain prices because pastures were parched - as they did this summer - it was a clear sign that this was no ordinary drought.

While rains in October brought some relief, further drought is forecast, which will add to losses already exceeding $5 billion. The bigger question is whether the Texan rancher's pain is a harbinger of things to come for the entire Southwest - and if so, what the broader impact on Americans living in the region will be.

Climate models indicate that the Southwest will get drier in the coming decades, threatening water supplies already under pressure from a growing population and ageing infrastructure.

Interactive graphic: "Parched future for the Southwest"

The most alarming projections come from a team led by Richard Seager of Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York. They ran 19 climate simulations, averaged out across the

entire Southwest, and came to a stark conclusion: that conditions matching the 1930s Dust Bowl and the multi-year droughts of the 1950s "will become the new climatology of the American Southwest" within decades (*Science*, DOI: 10.1126/science.1139601).

Water infrastructure can be overhauled, and this is what some states - Texas included - are planning. But their proposals mostly do not allow for what climate change may bring. The latest draft of the Texas State Water Plan, for instance, assumes that between now and 2060 the most severe drought it will face will match the worst on record, from 1950 to 1956. Texan officials argue that climate models do not give sufficiently reliable projections, at the level of individual river basins, to warrant planning for even more severe droughts. "I really can't adapt the planning assumptions," says Carolyn Brittin of the Texas Water Development Board.

It is possible to "downscale" climate models to deliver local predictions, either using statistical techniques or by adjusting them to fit with regional weather models. Unfortunately, while downscaled models give fairly consistent projections for temperature, they do not for precipitation - a situation that is unlikely to change soon.

Nevertheless, some water resource managers are prepared to take climate change into account. The most ambitious such project is being run by the Bureau of Reclamation, a federal government body which manages dams and reservoirs across the region. Its Colorado River Basin Water Supply & Demand Study is considering 112 different climate "futures" for a watershed that supplies some 30 million people across seven states. On average, these scenarios suggest that total water flow into the upper Colorado basin will fall by about 9 per cent between now and 2060.

In Colorado, Denver Water, which supplies about a quarter of the state's population, has used tree-ring records and downscaled climate models to build up a picture of possible future flows in rivers and streams in its catchment area. The tree-ring work shows that natural climate variability is likely to throw up worse droughts than those experienced since European settlement. Assuming warming of about 2.75 °C by 2050, the models also suggest there will be a water supply shortfall of 15 to 20 per cent, even if precipitation does not decline.

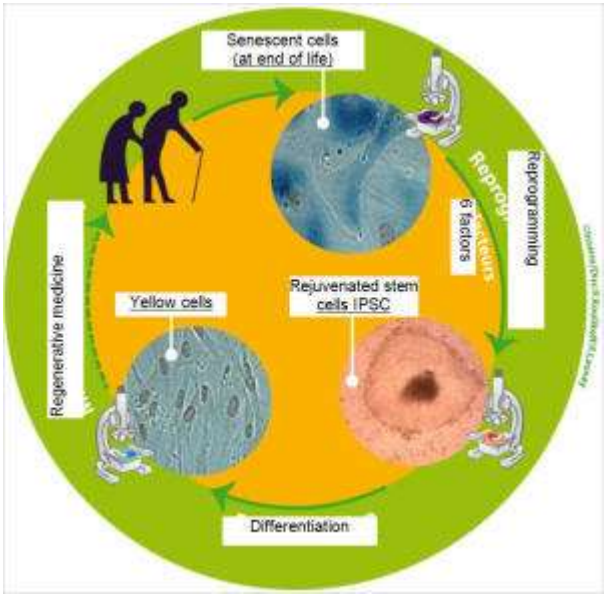
Denver Water is still deciding on its strategy, but given that more than half the water it supplies goes into watering lawns and other landscaping, it is likely to offer financial incentives for "xeriscaping" - replanting with native species that need less water.

In the longer term, there will be changes in store across the region. People may have to get used to the idea that water recovered from treated sewage is fit for drinking and not just for industrial use, for example.

The cost of failing to plan for a drier future could be a replay across the Southwest of the hardship faced by Texans in 2011. But agencies that are planning for climate change say it will be possible to adapt. "It's a manageable situation," says Thomas Buschatzke of the Arizona Department of Water Resources. "But it's not a situation that's going to manage itself."

http://www.newscientist.com/article/mg21228363.900-dust-bowl-looms-if-us-southwest-drought-plans-fail.html?full=true&print=true

Erasing the Signs of Aging in Human Cells Is Now a Reality



Reprogramming elderly senescent cells. (Credit: Image courtesy of INSERM)

ScienceDaily (Nov. 3, 2011) — Scientists have recently succeeded in rejuvenating cells from elderly donors (aged over 100). These old cells were reprogrammed in vitro to induced pluripotent stem cells (iPSC) and to rejuvenated and human embryonic stem cells (hESC): cells of all types can again be differentiated after this genuine "rejuvenation" therapy. The results represent significant progress for research into iPSC cells and a further step forwards for regenerative medicine.

Inserm's AVENIR "Genomic plasticity and aging" team, directed by Jean-Marc Lemaitre, Inserm researcher at the Functional Genomics Institute (Inserm/CNRS/Université de Montpellier 1 and 2) performed the research. The results were published in *Genes & Development* on November 1, 2011.

Human embryonic stem cells (hESC) are undifferentiated multiple-function cells. They can divide and form all types of differentiated adult cells in the body (neurons, cardiac cells, skin cells, liver cells, etc.). Since 2007, a handful of research teams across the world have been capable of reprogramming human adult cells into induced pluripotent cells (iPSC), which have similar characteristics and potential to human embryonic stem cells (hESC). This kind of reprogramming makes it possible to reform all human cell types without the ethical restrictions related to using embryonic stem cells.

Until now, research results demonstrated that senescence (the final stage of cellular aging) was an obstacle blocking the use of this technique for therapeutic applications in elderly patients. Today, Inserm researcher Jean-Marc Lemaitre and his team have overcome this obstacle. The researchers have successfully rejuvenated cells from elderly donors, some over 100 years old, thus demonstrating the reversibility of the cellular aging process.

To achieve this, they used an adapted strategy that consisted of reprogramming cells using a specific "cocktail" of six genetic factors, while erasing signs of aging. The researchers proved that the iPSC cells thus

obtained then had the capacity to reform all types of human cells. They have the physiological characteristics of "young" cells, both from the perspective of their proliferative capacity and their cellular metabolisms.

A cocktail of six genetic factors...

Researchers first multiplied skin cells (fibroblasts) from a 74 year-old donor to obtain the senescence characterized by the end of cellular proliferation. They then completed the in vitro reprogramming of the cells. In this study, Jean-Marc Lemaitre and his team firstly confirmed that this was not possible using the batch of four genetic factors (OCT4, SOX2, C MYC and KLF4) traditionally used. They then added two additional factors (NANOG and LIN28) that made it possible to overcome this barrier.

Using this new "cocktail" of six factors, the senescent cells, programmed into functional iPSC cells, re-acquired the characteristics of embryonic pluripotent stem cells.

In particular, they recovered their capacity for self-renewal and their former differentiation potential, and do not preserve any traces of previous aging. To check the "rejuvenated" characteristics of these cells, the researchers tested the reverse process. The rejuvenated iPSC cells were again differentiated to adult cells and compared to the original old cells, as well as to those obtained using human embryonic pluripotetent stem cells (hESC).

"Signs of aging were erased and the iPSCs obtained can produce functional cells, of any type, with an increased proliferation capacity and longevity," explains Jean-Marc Lemaitre who directs the Inserm AVENIR team.

…tested on cells taken from donors over the age of 100

The results obtained led the research team to test the cocktail on even older cells taken from donors of 92, 94 and 96, and even up to 101 years old. "Our strategy worked on cells taken from donors in their 100s. The age of cells is definitely not a reprogramming barrier." He concluded. "This research paves the way for the therapeutic use of iPS, insofar as an ideal source of adult cells is provided, which are tolerated by the immune system and can repair organs or tissues in elderly patients." adds the researcher.

Story Source:

The above story is reprinted from materials provided by **INSERM (Institut national de la santé et de la recherche médicale)**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Lapasset, L. et al. **Rejuvenating senescent and centenarian human cells by reprogramming through the pluripotent state**. *Genes & Development*, 2011 DOI: 10.1101/gad.173922.111

http://www.sciencedaily.com/releases/2011/11/111103120605.htm

Green tea and red laser attack Alzheimer's plaques

- Updated 17:28 03 November 2011 by **Belle Dumé**
- Magazine issue 2837

IT MAY sound like a strange brew, but green tea and red light could provide a novel treatment for Alzheimer's disease. Together, the two can destroy the rogue "plaques" that crowd the brains of people with the disease. The light makes it easier for the green-tea extract to get to work on the plaques.

Andrei Sommer at the University of Ulm in Germany, and colleagues, have previously used red light with a wavelength of 670 nanometres to transport cancer drugs into cells. The laser light pushes water out of the cells and when the laser is switched off, the cells "suck in" water and any other molecules, including drugs, from their surroundings.

Now, Sommer's team have found that the same technique can be used to destroy the beta-amyloid plaques in Alzheimer's. These plaques consist of abnormally folded peptides, and are thought to disrupt communication between nerve cells, leading to loss of memory and other symptoms.

The team bathed brain cells containing beta-amyloid in epigallocatechin gallate (EGCG) - a green-tea extract known to have beta-amyloid inhibiting properties - at the same time as stimulating the cells with red light. Beta-amyloid in the cells reduced by around 60 per cent. Shining the laser light alone onto cells reduced beta-amyloid by around 20 per cent (*Photomedicine and Laser Surgery*, DOI: 10.1089/pho.2011.3073).

It can be difficult getting drugs into the brain, but animal experiments show that the green-tea extract can penetrate the so-called blood-brain barrier when given orally together with red light. The light, which can penetrate tissue and bone, stimulates cell mitochondria to kick-start a process that increases the barrier's permeability, says Sommer.

There is no reason why other drugs that attack beta-amyloid could not be delivered to the brain in the same way, he adds.

"This important research could form the basis of a potential treatment for Alzheimer's, with or without complementary drug treatment," says Mario Trelles, medical director of the Vilafortuny Medical Institute in Cambrils, Spain.

"The technique described could help to regulate and even stop the appearance of this disease," he adds.

http://www.newscientist.com/article/mg21228374.600-green-tea-and-red-laser-attack-alzheimers-plaques.html

Maternal Separation Stresses the Baby, Research Finds

New evidence shows that separating infants from their mothers is stressful to the baby. (Credit: iStockphoto/Goldmund Lukic)

ScienceDaily (Nov. 2, 2011) — A woman goes into labor, and gives birth. The newborn is swaddled and placed to sleep in a nearby bassinet, or taken to the hospital nursery so that the mother can rest. Despite this common practice, new research published in *Biological Psychiatry* provides new evidence that separating infants from their mothers is stressful to the baby.

It is standard practice in a hospital setting, particularly among Western cultures, to separate mothers and their newborns. Separation is also common for babies under medical distress or premature babies, who may be placed in an incubator. In addition, the American Academy of Pediatrics specifically recommends against co-sleeping with an infant, due to its association with Sudden Infant Death Syndrome, or SIDS.

Humans are the only mammals who practice such maternal-neonate separation, but its physiological impact on the baby has been unknown until now. Researchers measured heart rate variability in 2-day-old sleeping babies for one hour each during skin-to-skin contact with mother and alone in a cot next to mother's bed. Neonatal autonomic activity was 176% higher and quiet sleep 86% lower during maternal separation compared to skin-to-skin contact.

Dr. John Krystal, Editor of *Biological Psychiatry*, commented on the study's findings: "This paper highlights the profound impact of maternal separation on the infant. We knew that this was stressful, but the current study suggests that this is major physiologic stressor for the infant."

This research addresses a strange contradiction: In animal research, separation from mother is a common way of creating stress in order to study its damaging effects on the developing newborn brain. At the same time, separation of human newborns is common practice, particularly when specialized medical care is required (e.g. incubator care). "Skin-to-skin contact with mother removes this contradiction, and our results are a first step towards understanding exactly why babies do better when nursed in skin-to-skin contact with mother, compared to incubator care," explained study author Dr. Barak Morgan.

More research is necessary to further understand the newborn response to separation, including whether it is sustained response and whether it has any long-term neurodevelopmental effects.

However, skin-to-skin contact has known benefits, and certainly, most would agree that unnecessarily stressing a newborn is unacceptable. Thus, as further evidence emerges, the challenge to doctors will be to incorporate skin-to-skin contact into routine treatment whilst still safely providing the other elements of newborn medical care.

Story Source:

The above story is reprinted from materials provided by **Elsevier**, via AlphaGalileo.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Barak E. Morgan, Alan R. Horn, Nils J. Bergman. **Should Neonates Sleep Alone?** *Biological Psychiatry*, 2011; 70 (9): 817 DOI: 10.1016/j.biopsych.2011.06.018

http://www.sciencedaily.com/releases/2011/11/111102124955.htm

Skin 'sees' the light to protect against sunshine

- 13:19 04 November 2011 by **Wendy Zukerman**

The skin sees too *(Image: Jenni Holma/Flickr Select/Getty)*

Step into the sun and it's not just your eyes that sense the light. Your skin contains photoreceptors like those in the retina, allowing it to mount an immediate defence against damaging ultraviolet radiation.

The skin tans by producing melanin, a pigment that protects DNA from dangerous UV rays. We already know that one component of the UV rays – called UVB – ramps up melanin production a few days after sun exposure in response to DNA damage in the skin. But another component of the radiation – UVA – encourages pigment production within minutes.

Elena Oancea and colleagues at Brown University in Providence, Rhode Island, think they know why. They analysed the genes expressed in melanocytes, the cells responsible for melanin production, and discovered that the cells also make rhodopsin, a light-sensitive chemical found in the retina.

When the team shone UVA light on melanocytes, they saw melanin production rise. Within 24 hours there was a five-fold increase in the production of the pigment. Knocking out the gene responsible for making rhodopsin in melanocytes blocked this immediate response to UVA.

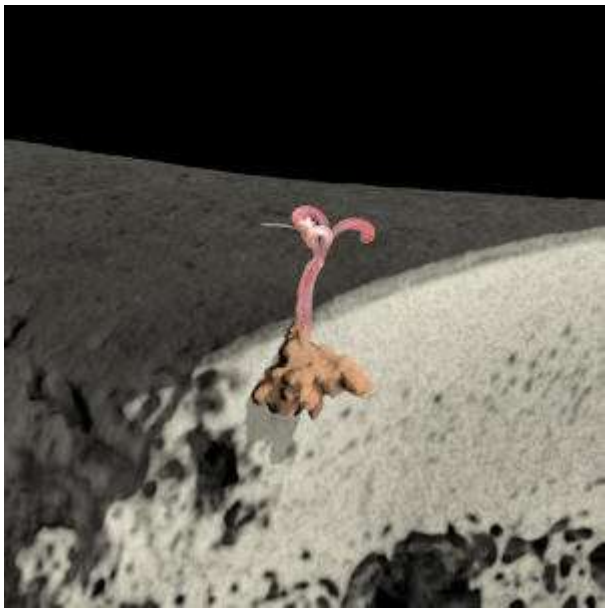
According to Oancea, the immediate tanning, although modest, may help to protect the skin against early DNA damage.

Rick Sturm at the University of Queensland in Brisbane, Australia, isn't convinced that "seeing" the light offers the skin much protection against damage, though. "Immediate tanning does not protect against UV-induced sunburn or DNA damage," he says.

Journal reference: *Current Biology*, DOI: 10.1016/j.cub.2011.09.047

http://www.newscientist.com/article/dn21127-skin-sees-the-light-to-protect-against-sunshine.html

'Zombie' Worms Found in Mediterranean Fossil



A computer-generated reconstruction of the Osedax worm responsible for borings found in a fossil whale bone in the Mediterranean, showing its root-like tissues used for feeding. (Credit: Image courtesy of University of Leeds)

ScienceDaily (Nov. 1, 2011) — Traces of bizarre, bone-eating 'zombie' worms have been found on a 3-million-year-old fossil whale bone from Tuscany in Italy. It is the first time the genus Osedax has been found in the Mediterranean, and suggests Osedax were widespread throughout the world's oceans 6 million years ago.

The new find, published in the journal *Historical Biology*, confirms what scientists have long suspected -- that Osedax were likely responsible for erasing parts of the fossil record by destroying bones before they could become fossils.

Worms from the Osedax genus do not have a mouth or gut but consume the bone by growing root-like tissues, which dissolve the bone as they grow.

Lead scientist Nicholas Higgs discovered tell-tale traces of Osedax in the Mediterranean last year using micro-CT (Computed Tomography) scanning technology as part of his PhD at the University of Leeds and the Natural History Museum.

He says: "After several promising leads came to a dead end, the scans from the final sample looked different and I knew that I was on to something."

Osedax were first discovered alive in 2002 in Monterey Bay, California, where they were living on the bones of a decaying gray whale.

Since then, scientists have been curious about how the worms might have affected fossil records, but understanding when Osedax evolved and where they lived in the past has until now remained a problem because actual remains of soft-bodied Osedax do not preserve as fossils.

The only way to tell where and when Osedax have been at work is by distinctive bulb-shaped cavities that they leave behind in a bone -- and it is these borings that have finally been recognised by Higgs.

His research shows how widespread Osedax were millions of years ago.

The only other known evidence of Osedax from the past is in whale bones from the Pacific coast of Washington State in the US -- about as far away as it is possible to get from the Mediterranean in terms of ocean connectedness.

When Mediterranean dried up almost six million years ago most deep sea animals were killed. About half a million years later the sea re-flooded from the Atlantic.

Higgs says: "So finding out that Osedax were feeding on this whale bone three million years ago tell us that their ancestors must have also been living in the Atlantic as well, because the Mediterranean was re-colonised 5.5 million years ago from the Atlantic."

It is now almost certain that the Mediterranean is currently host to undiscovered, living Osedax species, Higgs says.

"There are 20 different species in Monterey, California alone, so it's almost certain there are many more out there. If Osedax were living the Mediterranean three million years ago there's no reason why they aren't living there now."

Last year, Higgs travelled to California to examine living Osedax and their borings to help understand and identify the full range of known species.

Story Source:

The above story is reprinted from materials provided by **University of Leeds**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

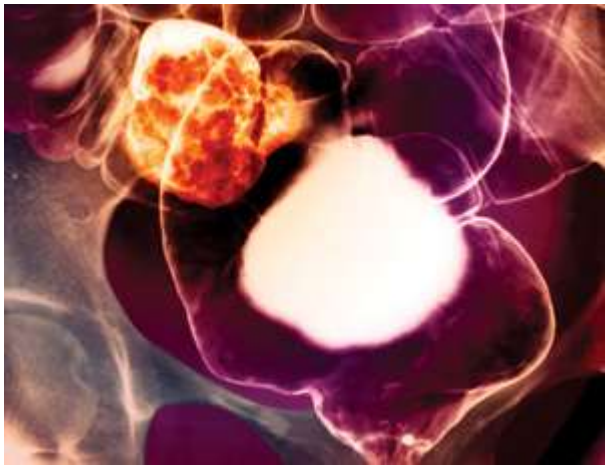
Journal Reference:

1. Nicholas D. Higgs, Crispin T.S. Little, Adrian G. Glover, Thomas G. Dahlgren, Craig R. Smith, Stefano Dominici. **Evidence of Osedax worm borings in Pliocene (~3 Ma) whale bone from the Mediterranean**. *Historical Biology*, 2011; DOI: 10.1080/08912963.2011.621167

http://www.sciencedaily.com/releases/2011/11/111101204358.htm

Everyday drugs could stop cancers before they hit

- 18:00 02 November 2011 by **Linda Geddes**
- Magazine issue 2837.



Colon cancer: too late for aspirin *(Image: Zephyr/Science Photo Library)*

People at high risk of cancer may soon be advised to take readily available drugs such as aspirin to reduce their chances of succumbing to one of the world's biggest killers.

Although cancer screening programmes already exist, offering women regular smear tests or mammograms, for example, to detect early signs of cervical or breast cancer, these look for precancerous changes to cells or suspicious lumps, rather than identifying people who are at high risk of cancer in the future. For many of these people, even those who possess a gene mutation that puts them at high risk, watchful waiting is the norm.

That could be about to change. It looks as if common drugs may be able to slash a person's chances of developing cancer – dubbed chemoprevention. "For people at high risk of cancer at least, chemoprevention is finally coming of age," says John Burn of Newcastle University, UK.

Breast cancer set the trend. Women over the age of 50 are often offered mammograms to detect early signs of cancer. Such screening has drawn controversy, as it can flag up harmless lumps as cancerous, leading women to undergo unnecessary investigation. However, mounting evidence suggests mammograms of healthy breasts might provide vital information on a woman's cancer risk in future, and that this information is not being put to good use.

"All the routine mammogram does is look for early cancers," says Jack Cuzick of the Wolfson Institute of Preventative Medicine in London. "But within this mammogram there's a lot of information about who is at risk." What's more, tamoxifen, a cheap drug that is already used to treat breast cancer, could significantly reduce the risk of the disease developing in the first place.

Several groups have found that healthy women with dense tissue in 75 per cent or more of the breast – around 5 to 10 per cent of the female population – were around four times as likely to develop breast cancer within 10 years following the diagnosis.

Breast density relates to the amount of connective and glandular tissue in the breast, and this produces hormones that can encourage cells to divide. "We think that this combination creates an environment in which changes are more likely to occur that can give rise to cancer in the future," says Norman Boyd of the Ontario Cancer Institute in Toronto, Canada.

Now, Cuzick and his colleagues have shown that treating women at high risk with tamoxifen can reduce breast density, cutting their risk of developing the most common form of breast cancer by up to 63 per cent. The results were presented at the Frontiers of Cancer Prevention Research meeting in Boston last week.

Tamoxifen does have some side effects, but for women whose mammograms suggest that they are at high risk, it could be an attractive option, says Cuzick.

Related drugs called aromatase inhibitors also show promise – one has been shown to reduce the occurrence of breast cancer by 65 per cent (*The New England Journal of Medicine*, DOI: 10.1056/NEJMoa1103507).

Chemoprevention isn't just focusing on breast cancer. Last week, a study in *The Lancet* showed that aspirin dramatically reduces the risk of developing colorectal cancer in people with a family history of the disease. "We set out to see if aspirin would prevent cancer, and it does," says Burn, who led the study.

This is especially significant for developing countries, where cancer rates are escalating at a staggering rate (see "Poor countries need cancer drugs").

Burn and his colleagues studied 861 people with a hereditary form of colorectal cancer called Lynch syndrome, who began taking two 300-milligram tablets of aspirin a day or a placebo at some point between 1999 and 2005. By 2010, there had been 19 new colorectal cancers in those who had taken aspirin and 34 in the placebo group. In people who had taken aspirin for more than two years the effects were even more pronounced (*The Lancet*, DOI: 10.1016/S0140-6736(11)61049-0).

"It provides the first evidence that aspirin is effective in reducing the very high risk of cancer that these individuals have," says Peter Rothwell of the University of Oxford, who earlier this year found that a daily dose of 75 mg of aspirin for more than five years reduced the risk of dying from all cancers by 34 per cent.

Both Burn and Rothwell say they now regularly take aspirin for cancer prevention, but emphasise that self-medication is a personal decision: everyone has to weigh up the pros and cons for themselves. "Up until now, the main reason to take aspirin was to prevent vascular events. I think it will become clear that cancer prevention is the main benefit of aspirin in healthy middle-aged people," says Rothwell.

Lung cancer is another disease where preventative therapy could reap rewards: especially for the millions of ex-smokers who remain at increased risk of disease. In a trial of 152 smokers and former smokers, a drug called iloprost significantly reduced abnormalities in cells lining the airways over the course of six months in those who had kicked the habit, but not in current smokers. "If this holds up, it suggests that former smokers could reduce their risk of developing lung cancer by taking a drug," says Robert Keith of the University of Denver in Colorado, who also presented his results in Boston last week. Iloprost is a synthetic version of a naturally occurring molecule called prostacyclin, which can suppress cell growth and division.

Bringing such preventative drugs to market may not be so easy, however. One of the biggest barriers is the need to test these drugs in large numbers of healthy individuals, which will inevitably produce side-effects in some people. "Chemoprevention is tremendously appealing, but it is a more difficult path to traverse than developing a therapeutic drug," says Michael Thun of the American Cancer Society.

It is also an issue for people like Cuzick, who want tamoxifen and related drugs made available as a precaution for people at high risk. "Treatment can't be the whole answer," he says. "We've got to do something about prevention."

Poor countries need cancer drugs

Surprisingly, cancer now kills more people in developing countries than malaria, AIDS and tuberculosis combined. More than 2.4 million lives could be saved each year using affordable and readily available drugs to prevent or treat cancer.

So says a report released last week by the Global Task Force on Expanded Access to Cancer Care and Control in Developing Countries (GTF.CCC).

Better drugs mean that more people in developing countries survive infectious diseases. But they are starting to fall prey to the same illnesses that strike in richer countries – cancer, cardiovascular disease and diabetes. By 2030, nearly 70 per cent of the projected 27 million new cancer cases each year will occur in those countries with the least infrastructure to deal with it. "Unless we take action now, these countries will be overwhelmed by the economic burden of disease," says David Kerr of the University of Oxford, who has set up a network of collaborations in India and Africa to improve cancer care. "It's not a success story to say we've avoided death in the first five years of life, and we've avoided death in childbirth, but we ignore what happens with cancer."

According to the report, 26 of 29 key drugs that could treat the most prevalent and curable cancers are off-patent, meaning people could receive a course of treatment for less than $100.

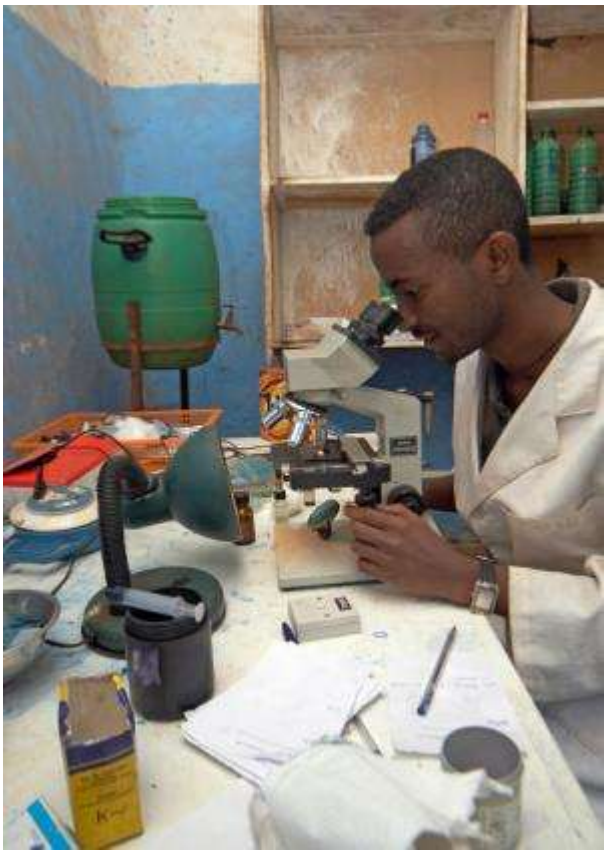
For example, the survival rate for childhood leukaemia in Canada is around 90 per cent, but in low-income countries, only 10 per cent survive because they do not have access to the drugs, even though they are off-patent.

"A couple of hundred million dollars would treat all of these childhood leukaemias," says Julio Frenk, Dean of Harvard School of Public Health and co-chair of the GTF.CCC. "It's just lack of access."

http://www.newscientist.com/article/dn21119-everyday-drugs-could-stop-cancers-before-they-hit.html?

The case for science in Africa

- 15:40 04 November 2011 by **Martyn Poliakoff**



Partners from elsewhere could help *(Image: Andrew Holt/Photographer's Choice/Getty)*

Africa is plagued by poverty but can't afford not to invest in science

Africa faces serious problems – droughts and famines, infectious diseases and a shortage of good housing, to name a few. Each country also faces unique challenges, from the recent conflicts in Sudan and the Democratic Republic of the Congo to exceptionally high HIV infection rates in South Africa.

Earlier this year, science ministers from the continent agreed to start an "African decade of science". Financial resources are scarce, however, and the need to address critical problems urgent. How do governments juggle spending on science with humanitarian needs?

There are examples of excellent science in Africa which may provide the answer. The UK's science academy, the Royal Society, has for the past six years recognised the work of young scientists from the continent through its Pfizer award. This year's winner, Julie Makani, is working to save thousands of Tanzanians from sickle-cell disease (SCD).

Something that has struck me about Makani is her extensive links to researchers inside and outside Africa. Such collaboration is likely to be the linchpin of further scientific success in Africa: researchers there need to be able to identify problems and then engage with peers in Europe, Asia and the US to find solutions. The Leverhulme-Royal Society Africa Awards for collaborative research projects between the UK and research institutions in Ghana or Tanzania help support this.

Pledges and reality

Africa has been of special interest to me since my son was a volunteer in Ethiopia under the VSO scheme in 2003. As a scientist I can see the benefit that science could bring. But I am also conscious that it is difficult for African governments to justify funding a lot of basic research.

For example, in 1980, as part of the Lagos Plan of Action adopted by the Organization of African Unity – the African Union's predecessor – African governments pledged to spend 1 per cent of GDP on R&D, a goal that was restated in 2003. However, of the 54 member nations of the African Union, only South Africa, Uganda and Malawi have achieved anything close to this.

Most African countries get the majority of their R&D budgets from overseas, mainly from philanthropists, non-governmental organisations, aid agencies and traditional funders such as the Wellcome Trust. There is a need for this, but some might argue that it prevents the nations from choosing their own research priorities.

As foreign secretary elect of the Royal Society, I am determined to engage with Africa to help address such issues; a determination shared by the current foreign secretary, Lorna Casselton. My starting point will be to ask scientists in African countries what they need to become part of the international scientific community. My experience with Ethiopia has taught me the importance of listening to African scientists, rather than telling them what to do.

Championing science

The work of the African national science academies is a crucial part in the jigsaw. Last month I met representatives from 13 out of the 17 academies: it was a chance to learn from each other about communicating scientific priorities to governments and policy-makers, something that can truly save lives.

A case in point was the catastrophic failure of scientific evidence to inform policy in South Africa at the turn of the century. Thabo Mbeki, the country's president at the time, supported the Duesberg hypothesis – the belief that various non-infectious factors such as recreational and pharmaceutical drug use are the cause of AIDS and that HIV is a harmless passenger virus. It is estimated that his policies caused an additional 330,000 deaths in South Africa over the eight years to 2007 because of delay in the provision of antiretroviral drugs.

In 2007, the Academy of Science of South Africa released an influential report on HIV/AIDS, TB and nutrition which gained international recognition and helped to shift South Africa's public HIV policy back to the mainstream. The academy has since produced a wide variety of policy reports and is now an important independent adviser to the government.

This emphasises just how vital the academies can be, both supporting and building on the strengths of their scientific communities and using their position to bridge the gap between science and society. By acting as champions for science, they are able to demonstrate the value of investment in it and create an in-country demand for it.

In the UK, the case for the public funding of science revolves around it being an engine for economic growth. My African colleagues are keen to make a similar case, as well as demonstrate that high-quality research underpins their ability to respond to issues such as healthcare, sustainable agriculture and clean water.

Looking ahead

Academies also have an important role in nurturing the next generation of researchers. The Royal Society supports promising young researchers in the UK as the potential scientific leaders of tomorrow. It believes a similar approach will be effective in Africa. As in the UK, African scientists also need to engage with the public and stimulate a wider interest so that young people are motivated to study science and pursue scientific careers.

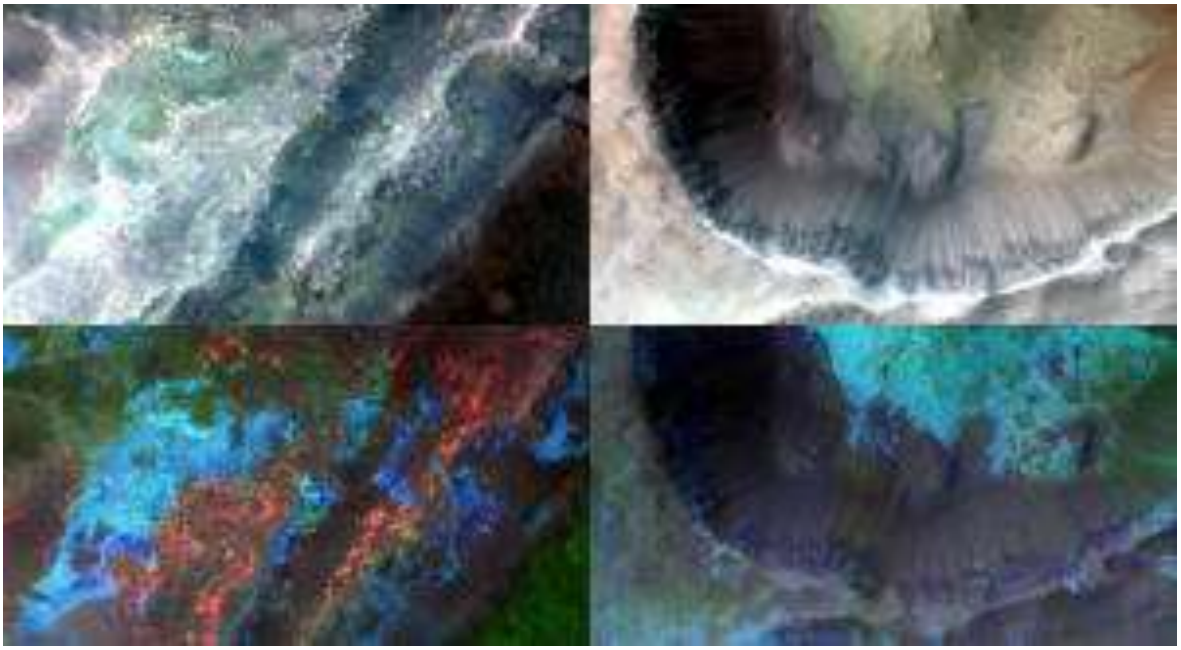
We cannot tell Africa what science it needs to do but we can help it to develop that agenda. It has to be set by its public, policy-makers, governments and scientists together. Despite the many hurdles ahead, one thing is certain: scientific research must become as much a part of Africa's long-term development as building roads, vaccinating children and improving education.

Profile

Martyn Poliakoff is a research professor in chemistry at the University of Nottingham, UK, honorary professor at Moscow State University, Russia, and honorary member of the Chemical Society of Ethiopia. He was elected a fellow of the Royal Society in 2002 and takes over as its foreign secretary at the end of this month.

http://www.newscientist.com/article/dn21129-the-case-for-science-in-africa.html?full=true&print=true

Did Life Once Exist Below Red Planet's Surface? NASA Study of Clays Suggests Watery Mars Underground



Impact cratering and erosion combine to reveal the composition of the Martian underground by exposing materials from the subsurface. (Credit: NASA/JPL-Caltech/JHUAPL)

ScienceDaily (Nov. 2, 2011) — A new NASA study suggests if life ever existed on Mars, the longest lasting habitats were most likely below the Red Planet's surface.

A new interpretation of years of mineral-mapping data, from more than 350 sites on Mars examined by European and NASA orbiters, suggests Martian environments with abundant liquid water on the surface existed only during short episodes. These episodes occurred toward the end of a period of hundreds of millions of years during which warm water interacted with subsurface rocks. This has implications about whether life existed on Mars and how the Martian atmosphere has changed.

"The types of clay minerals that formed in the shallow subsurface are all over Mars," said John Mustard, professor at Brown University in Providence, R.I. Mustard is a co-author of the study in the journal *Nature*. "The types that formed on the surface are found at very limited locations and are quite rare."

Discovery of clay minerals on Mars in 2005 indicated the planet once hosted warm, wet conditions. If those conditions existed on the surface for a long era, the planet would have needed a much thicker atmosphere than it has now to keep the water from evaporating or freezing. Researchers have sought evidence of processes that could cause a thick atmosphere to be lost over time.

This new study supports an alternative hypothesis that persistent warm water was confined to the subsurface and many erosional features were carved during brief periods when liquid water was stable at the surface.

"If surface habitats were short-term, that doesn't mean we should be glum about prospects for life on Mars, but it says something about what type of environment we might want to look in," said the report's lead author, Bethany Ehlmann, assistant professor at the California Institute of Technology, Pasadena, and scientist at NASA's Jet Propulsion Laboratory, also in Pasadena. "The most stable Mars habitats over long durations

appear to have been in the subsurface. On Earth, underground geothermal environments have active ecosystems."

The discovery of clay minerals by the OMEGA spectrometer on the European Space Agency's Mars Express orbiter added to earlier evidence of liquid Martian water. Clays form from the interaction of water with rock. Different types of clay minerals result from different types of wet conditions.

During the past five years, researchers used OMEGA and NASA's Compact Reconnaissance Imaging Spectrometer, or CRISM, instrument on the Mars Reconnaissance Orbiter to identify clay minerals at thousands of locations on Mars. Clay minerals that form where the ratio of water interacting with rock is small generally retain the same chemical elements as those found in the original volcanic rocks later altered by the water.

The study interprets this to be the case for most terrains on Mars with iron and magnesium clays. In contrast, surface environments with higher ratios of water to rock can alter rocks further. Soluble elements are carried off by water, and different aluminum-rich clays form.

Another clue is detection of a mineral called prehnite. It forms at temperatures above about 400 degrees Fahrenheit (about 200 degrees Celsius). These temperatures are typical of underground hydrothermal environments rather than surface waters.

"Our interpretation is a shift from thinking that the warm, wet environment was mostly at the surface to thinking it was mostly in the subsurface, with limited exceptions," said Scott Murchie of Johns Hopkins University Applied Physics Laboratory in Laurel, Md., a co-author of the report and principal investigator for CRISM.

One of the exceptions may be Gale Crater, the site targeted by NASA's Mars Science Laboratory mission. Launching this year, the mission's Curiosity rover will land and investigate layers that contain clay and sulfate minerals.

NASA's Mars Atmosphere and Volatile Evolution Mission, or MAVEN, in development for a 2013 launch, may provide evidence for or against this new interpretation of the Red Planet's environmental history. The report predicts MAVEN findings consistent with the atmosphere not having been thick enough to provide warm, wet surface conditions for a prolonged period.

JPL, a division of Caltech, manages the Mars Reconnaissance Orbiter for NASA's Science Mission Directorate in Washington. APL provided and operates CRISM. For more information about the Mars Reconnaissance Orbiter, visit: http://www.nasa.gov/mro and http://mars.jpl.nasa.gov/mro .

Story Source:

The above story is reprinted from materials provided by **NASA/Jet Propulsion Laboratory**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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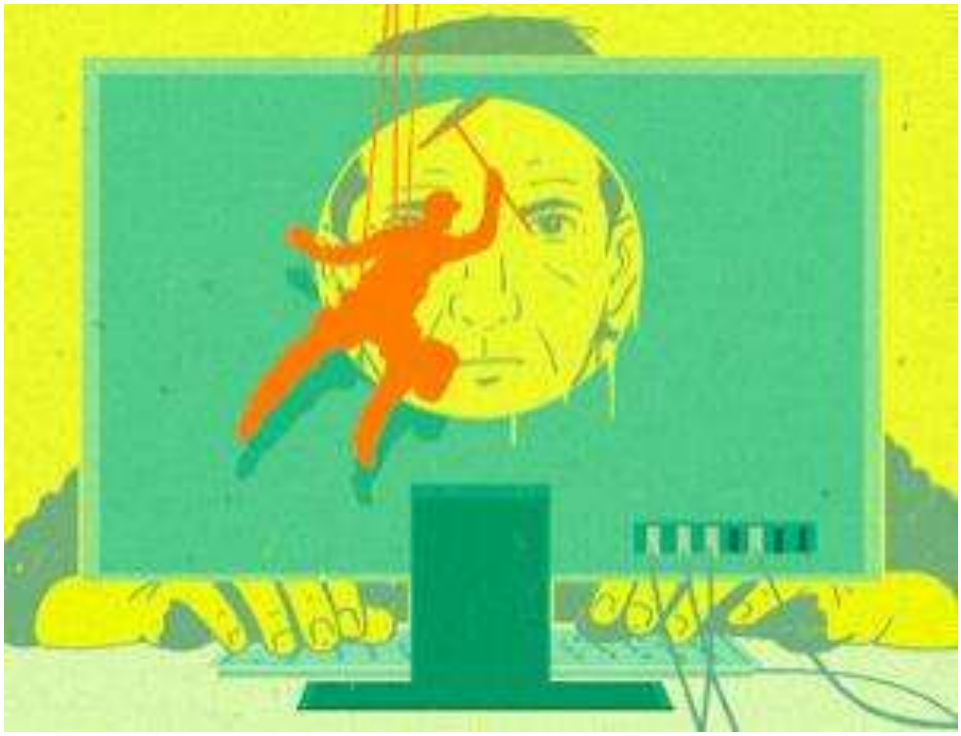
1. Bethany L. Ehlmann, John F. Mustard, Scott L. Murchie, Jean-Pierre Bibring, Alain Meunier, Abigail A. Fraeman, Yves Langevin. **Subsurface water and clay mineral formation during the early history of Mars**. *Nature*, 2011; 479 (7371): 53 DOI: 10.1038/nature10582

http://www.sciencedaily.com/releases/2011/11/111102145736.htm

The real you: Say goodbye to online anonymity

- 03 November 2011 by **Jim Giles**
- Magazine issue 2836.



The real you (Image: Dan Page)

Online anonymity may be a luxury we can no longer afford – and it's disappearing fast anyway. Are we ready to bare all on the internet?

IN JULY last year, Orlando Figes, one of the UK's most eminent historians, admitted posting savage critiques of rivals' books on the Amazon website under the pseudonym "Historian" - alongside praise of his own. His eventual confession came only after he had threatened to take legal action against anyone who accused him of the misdeed. Later he blamed his wife for the reviews.

Figes's online behaviour is an example of what's known as sock puppetry - pretending to be someone other than who you are for the sake of furthering your own interests. It made for a juicy academic scandal that in the end hurt him more than anyone else, but the consequences of the internet's ability to cloak users' identities aren't always so confined. Vicious cyberbullying has, in extreme cases, driven victims to suicide. Scammers and spammers can hijack email addresses to steal banking credentials and even state secrets. Earlier this year, for example, a convincing email fooled several senior US government officials into handing over their email passwords to hackers. For all the benefits that the internet has brought us, it often remains a deeply uncivilised place.

Illegal and just plain bad behaviour online has sparked discussions of new laws to combat cyberbullying and secure the internet from criminal activity. Such legislation may soon be irrelevant. Several companies are building tools that can identify internet users with unprecedented precision. Proponents claims the new tools

will lead to a safer and less hostile internet. If the internet is to keep developing, they say, perhaps we can no longer afford to live in an anonymous environment where no one need ever be held accountable for their actions. Are we ready to abandon the option of shielding our online identity?

"The internet would be better if we had an accurate notion that you were a real person as opposed to a dog, or a fake person, or a spammer," Eric Schmidt, Google's executive chairman, told an audience in the UK at the Edinburgh Television Festival in August.

The ability to be a "fake person" is a large part of why comments on otherwise respectable publications often descend into outright abuse. Similarly, the ease with which it's possible for wrongdoers to cover their tracks online enables credit-card fraud, which costs retailers and the card companies hundreds of millions of dollars a year in the US alone. Retailers simply have no easy way of knowing whether the buyer is who they claim to be. So it remains fairly easy to purchase goods online using a stolen credit card. A more robust method for verifying identity would almost certainly reduce fraud.

So why not have people take their identities with them any time they use the internet? The problem, simply put, is that no one wants to be forced to use their real name online. At least one previous attempt to create an identity system for the internet, Microsoft's Passport initiative of the early 2000s, failed in part because privacy advocates objected to one organisation controlling the process.

That changed, however, with the arrival of Facebook. To use the social network, you must register with your real name. Once logged in, everything you do - posting messages, sending messages, tagging photos - is attributed to what, for most users, is their actual, offline identity.

Using your real name on a single site may not seem like a big deal, but Facebook's reach continues to creep beyond Facebook.com. Since 2008, websites have been able to integrate with Facebook in such a way that their visitors must be Facebook users to post comments. Each post is clearly associated with the user who made it.

Why would anyone want this? As it turned out, Facebook integration benefited not only the websites that adopted it, by making it much easier to police comments, but also individual users, who could then conveniently log into multiple sites with their Facebook password. Users' comments could also be set to be copied automatically to their Facebook wall, so their friends could easily see what they had posted.

The effects were immediate. Before popular technology blog TechCrunch introduced Facebook integration earlier this year, half of their comments were either from spammers hawking their wares or were "trollish nonsense", wrote TechCrunch columnist M. G. Siegler in an article explaining the site's decision. After the change, the majority of comments became "coherent thoughts in response to the post itself - you know, what a comment is supposed to be".

Google's new social network, Google+, also requires people to use their real names when signing up. And with Facebook's and Google's social networks likely to become increasingly intertwined with the rest of the web, eventually one or both could very well emerge as de facto online identity systems.

Most people who tie their real identites to their Facebook and Google accounts don't need much policing. Scammers and trolls, on the other hand, can simply decamp to the parts of the online world that are not integrated with either company.

There too, however, identity technologies are waiting to catalogue their misdeeds. Whether or not you share your identity with the websites you visit is no longer entirely within your control.

Indelible ID

One of the most powerful identity tracking systems now available is offered by BlueCava, a company based in Irvine, California, that helps websites monitor fraud, among other things. BlueCava's software "fingerprints" any device that someone uses to visit a website, be it a desktop or laptop computer or a mobile device like a smartphone. That fingerprint is made possible by the hundreds of types of data that browsers send when connecting to a website, from the machine's operating system to the time zone in which the device is set to operate (see diagram).

You might be surprised at just how mundane these details can be. Consider one of the data types passed from browser to website: the fonts installed on your machine. They will include not just the fonts that it came with, but also fonts that may have been included with software you installed, making the complete list distinctive. "A typical machine has 4000 to 20,000 fonts," says BlueCava chief executive David Norris. Fall outside this average and your machine is distinctive. "If you have 1926 that's a lot of uniqueness," Norris says.

See more: view the data your browser is passing to websites using an online test from privacy.net.

BlueCava combines these bits of information to create a unique ID number for every device that accesses a website running the company's software. The firm has assembled a dossier on 1 billion devices, and Norris estimates that the number will double in the coming year. At this rate, it won't be long, he says, before all 10 billion internet-enabled computers in the world have a place in BlueCava's repository. Norris claims that when presented with a query from a machine already in the database, the software can recognise its source 99.5 per cent of the time.

BlueCava also has what it calls a reputation exchange - a database of information on how devices that the company has fingerprinted have been used over the past year. When online fraud occurs, information about the guilty party's computer is sent to the database. Retailers who check the database can then decide to bar that device from being used to make purchases on their website.

Although the system can be extremely effective, it does have one large loophole: not every computer has just one user. Take the cybercriminal who logs in at an internet cafe, for example. Even when a device only has a single user, they can cover their tracks when sending email, which is relayed via mail servers and doesn't necessarily leave accurate traces back to the originating device. Neither voluntary identity-sharing via social networks nor device fingerprinting can address this issue, leaving scammers and spammers free to continue using email for their nefarious purposes.

Most spam is no more than annoying, and most people manage to resist email offers of cheap Viagra. But hackers are infamously handy at faking the originating address so that an email appears to come from a trusted source, like a close relative, a bank employee or indeed anyone the hacker thinks you will deem trustworthy. "Give me ten minutes and I can arrange for you to get an email from Santa Claus," says Patrick Juola, a computer scientist at Duquesne University in Pittsburgh, Pennsylvania. While filters may block some of these messages, they offer no hope of definitively determining the sender's identity.

Here too, however, solutions are beginning to emerge. One approach traces its roots to the collapse of the energy giant Enron in 2001. In the ensuing government investigation, 1.5 million company emails were made public. Researchers analysed them and found patterns in the way the messages were written. This has helped them build software that can identify the author of an email.

Such systems rely on idiosyncrasies in everyday writing. Some people prefer long sentences to short ones; one writer is formal while another embraces slang; Americans and Brits use different spellings. Preposition use also varies: we can "work for" or "work at" a company, but an individual will probably not switch

between the two forms in writing. Given a big enough database of a person's writing style, and algorithms that can accurately find patterns in it, researchers can compile a style signature that can be used to check whether a piece of text was authored by that person.

Earlier this year Juola helped organise a competition that tested various programs on the Enron emails, as part of the run-up to a workshop entitled "Uncovering Plagiarism, Authorship, and Social Software Misuse", held in Amsterdam, the Netherlands, in September. The results showed that the software entrants correctly identified the author of up to 70 per cent of the emails they were tested on. This accuracy is likely to increase, Juola says.

It has to be you

Authorship authentication software could be bolted onto a company's email system, where it would identify the sender of a message not by their name - easily spoofed in emails - but by their style of writing, which is much harder to fake. The same software could be used to analyse what people post online. Tempted to write a glowing review of a friend's product under a fake name? Or to anonymously criticise a rival, like Figes did? Do it often enough and such software may one day reveal links to material written under your real name.

Now stand back for a minute. A series of robust identity technologies is spreading across the web. Powerful new authentication methods like writing-style analysis are probably just a couple of years away from being put into widespread use. In a report issued this April, the US government issued a report calling for an interlocking system of compatible identity systems. It seems like one is already emerging.

Will online anonymity, and the crime and abuse that come with it, become a remnant of a past age? Is the internet about to grow up?

Before we throw a coming-of-age party, we might take a moment to consider the implications. Identity-tracking systems can have a chilling effect on people's willingness to express themselves online. In 2007, South Korea began requiring users of the country's major websites to sign up with their national identity number to post comments. A study by Jisuk Woo at Seoul National University found that the rate at which people posted comments on the popular forum dcinside dropped precipitously after the law went into force. "Most users became afraid to write on online services," adds Chun Eung Hwi, a consumer rights campaigner in Seoul. "They were reduced to passive readers and kept silent on public issues." Yet the evidence for a fall in libellous or obscene comments was mixed. A similar dynamic was evident at TechCrunch. Though the quality of comments increased with Facebook integration, their numbers decreased. Siegler pondered whether people were censoring themselves.

While no western government is proposing anything similar, private ownership of identity databases like Facebook's and Google's introduces comparable problems. Facebook has a history of changing its privacy policy suddenly to suit its commercial aims. While Google's stated mission is to organise the world's information, "at the end of day it makes its money by selling its users' profiles to advertisers for target marketing", says Dino Pedreschi, a computer scientist at the University of Pisa in Italy. Pedreschi, who is working on a major study of trusted identity systems, says it is crucially important for such systems to be controlled by entities who are not driven by profits.

What's more, online social networks collapse our social lives to a single space, completely unlike normal life where we generally interact with different groups at different times and in different ways. A person might share a radical political view with a friend but shy away from expressing the same opinion at work, for example. It is normal for us to take on what sociologists call different "social roles", yet this behaviour is inhibited by the openness of Facebook, and less directly by the less transparent technologies that bind our online activities into a single identity.

Granted, people tend to behave better when they are visibly part of a social network as opposed to operating anonymously, says Zeynep Tufekci, a sociologist at the University of North Carolina, Chapel Hill. However, she adds, "Facebook is the wrong tool to extend to the rest of the web."

Letting users adopt nicknames on social networks might be one answer, combining the civilising effect of social networks with the ability to adopt different social roles. "Most of the time we want pseudonymity, not anonymity," says Danah Boyd at Microsoft Research in Cambridge, Massachusetts. And yet, a pseudonym is exactly what Figes was using when he trashed his rivals' work.

The question that will shape the future of identity on the net is how much we are willing to give up to be assured that every book reviewer on Amazon is who they say they are. Right now, along with anonymously maligning the competition, we are all free to peruse websites on radical politics, investigate medical diagnoses and make a cheeky remark or two in a chat room - all without feeling that anyone is looking over our shoulder. Would we be willing to do so if all of our online actions were logged in an identity database?

Jim Giles *is a correspondent for New Scientist*

http://www.newscientist.com/article/mg21228361.800-the-real-you-say-goodbye-to-online-anonymity.html?full=true&print=true

Babies Understand Thought Process of Others at 10 Months Old, Research Suggests

At 10 months, babies start to understand another person's thought process, providing new insights on how humans acquire knowledge and how communication develops, new research suggests. (Credit: © Irina Magrelo / Fotolia)

ScienceDaily (Nov. 1, 2011) — New research from the University of Missouri indicates that at 10 months, babies start to understand another person's thought process, providing new insights on how humans acquire knowledge and how communication develops.

"Understanding other people is a key factor in successful communication, and humans start to understand this at a very young age," said Yuyan Luo, associate professor of developmental psychology in the MU College of Arts and Science. "Our study indicates that infants, even before they can verbally communicate, can understand the thought processes of other people -- even if the thoughts diverge from what the infants know as truth, a term psychologists call false belief."

During the study, infants were monitored during different trials of a common psychological test in which an actor indicated preference for certain objects. Researchers timed the infant's gaze, which is an indication of infant knowledge. The infants watched longer when the actor's preferences changed. This led the researchers to believe that infants understood how the actor interacted with the objects.

"When the actor did not witness the removal or addition of the preferred object, the infants seemed to use that information to interpret the person's actions," Luo said. "The infants appear to recognize that the actor's

behavior comes from what the actor could see or could not see and hence what the actor thinks, and this finding is consistent with similar false belief studies that involve older children."

Luo said her study is one of the first to explore the false belief understanding in the first year of life; evidence from other studies indicates that infant understanding could be present at an earlier age. As the research moves forward, Luo expects to find more understanding of how humans learn to communicate.

"In adults, beliefs guide behavior, but it would be difficult to explain another person's behavior without explaining his or her mental state," Luo said.

Story Source:

The above story is reprinted from materials provided by **University of Missouri-Columbia**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Yuyan Luo. **Do 10-month-old infants understand others' false beliefs?** *Cognition*, 2011; 121 (3): 289 DOI: 10.1016/j.cognition.2011.07.011

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Crime algorithms target gangs of LA

- 14:10 03 November 2011 by **Melissae Fellet**

A computer network of gang rivalries could help pin down the perpetrators of inter-gang violence *(Robert Nickelsberg/Getty)*

The notorious gangsters of Los Angeles are the latest target in an attempt to use computer algorithms to speed up crime investigations.

Andrea Bertozzi of the University of California, Los Angeles and colleagues have designed software that uses a network of gang rivalries to predict which gang is most likely responsible for a given crime.

Working this out can be tough. Take 30 gangs in the Los Angeles district of Hollenbeck. Each has six to seven rivals and investigating all of them in order to find the perpetrator of a particular attack is too time-consuming.

To help narrow down the search, Bertozzi's team represented the known gang rivalries of Hollenbeck as a web-like network with lines connecting rivals. Then the team looked at criminal activity across the network, some of which follows a predictable pattern in time, much like aftershocks from an earthquake.

Simulated attack

By combining equations that describe this pattern with the network, the researchers could use the timing of an unsolved crime to predict which rivalry could be relevant. This helped them to calculate a probability that a given gang caused a particular incident.

To test the accuracy of their program, the researchers simulated attacks based on the patterns they detected in 10 years of Hollenbeck gang crime data. They created unsolved crimes for the program by removing information about the victim, perpetrator or both from their artificial crime data. Then they fed the incomplete data to the program.

Reluctant witness

This worked pretty well. The program produced three most likely gangs for each "unsolved crime", and these three included the correct gang 80 per cent of the time.

Using the program to narrow down the possible perpetrators to a few gangs might be helpful to police, says Zach Friend, spokesman for the Santa Cruz police department in California. In the case of gang violence, investigations tend to be particularly time-consuming as victims of such crimes are often reluctant to participate, he adds.

The SCPD is already field-testing software that uses the locations of past crimes of a certain type to flag up likely future crime scenes, allowing police to patrol those areas in the hopes of stopping the crimes happening at all.

Inverse Problems, DOI: 10.1088/0266-5611/27/11/115013

http://www.newscientist.com/article/dn21122-crime-algorithms-target-gangs-of-la.html?full=true&print=true

Eastern U.S. Forests Not Keeping Pace With Climate Change, Large Study Finds

Researchers have found that more than half of eastern US tree species aren't adapting to climate change as quickly or consistently as predicted. (Credit: © Sean Gladwell / Fotolia)

ScienceDaily (Oct. 31, 2011) — More than half of eastern U.S. tree species examined in a massive new Duke University-led study aren't adapting to climate change as quickly or consistently as predicted.

"Many models have suggested that trees will migrate rapidly to higher latitudes and elevations in response to warming temperatures, but evidence for a consistent, climate-driven northward migration is essentially absent in this large analysis," says James S. Clark, H.L. Blomquist Professor of Environment at Duke's Nicholas School of the Environment.

Nearly 59 percent of the species examined by Clark and his colleagues showed signs that their geographic ranges are contracting from both the north and south.

Fewer species -- only about 21 percent -- appeared to be shifting northward as predicted. About 16 percent seemed to be advancing southward, and around 4 percent appeared to be expanding in both directions.

The scientists analyzed data on 92 species in more than 43,000 forest plots in 31 states. They published their findings this month in the journal *Global Change Biology*.

The study found no consistent evidence that population spread is greatest in areas where climate has changed the most; nor do the species' response patterns appear to be related to seed size or dispersal characteristics. "Warm zones have shifted northward by up to 100 kilometers in some parts of the eastern United States, but our results do not inspire confidence that tree populations are tracking those changes," says Clark, who also

holds appointments at Duke as a professor of biology and statistics. "This increases the risk of serious lags in tree migrations."

The concept of climate-driven migration is based on the assumption that as temperatures warm, the southern edge of some tree species' ranges could begin to erode as adult trees die and the seeds they leave behind in the soil can no longer sprout. At the same time, the species could spread to higher latitudes as seedlings dispersed on their northern boundaries are able to take root in newly favorable climates there.

To test whether this predicted response was occurring in real life, Clark and his colleagues pored through decades of data compiled by the U.S. Forest Service's Forest Inventory and Analysis Program. They compared the relative distributions of seedlings, saplings and adult trees of 92 widely distributed eastern U.S. species at 43,334 plots in 30 different longitudinal bands, and factored in things like seed characteristics, and changes in climate and precipitation.

"The patterns of tree responses we were able to document using this seedling-versus-tree analysis are more consistent with range contraction than with northward migration, although there are signs some species are shifting to higher elevations," Clark says.

The fact that the majority of the northernmost latitudes documented for seedlings was lower than those for adult trees of the same species indicates "a lack of evidence for climate-mediated migration, and should increase concern for the risks posed by climate change," he says.

Kai Zhu, a doctoral student of Clark's at Duke, was lead author of the study. Christopher W. Woodall, research forester at the U.S. Forest Service's Northern Research Station in St. Paul, Minn., was a co-author.

The study was funded by the National Science Foundation.

Story Source:

The above story is reprinted from materials provided by **Duke University**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/10/111031154132.htm

"How I dislike that play now . . ."
Alan Jenkins

George Craig, Martha Dow Fesenfeld, Dan Gunn and Lois More Overbeck, editors
THE LETTERS OF SAMUEL BECKETT
Volume Two: 1941–1956
864pp. Cambridge University Press. £30 (US $50).
978 0 521 86794 8

George Craig
WRITING BECKETT'S LETTERS
36pp. Sylph Editions / American University of Paris. £10.
978 0 9565092 7 7
Published: 2 November 2011

O ne of the last of Samuel Beckett's letters in Volume One of this indispensable edition was written to James Joyce, in January 1940. In it Beckett thanked Joyce for having brought his work to the attention of a potential sponsor. "It was kind of you to write him about Murphy. He offers very kindly to read the translation & to 'introduce' me to the French public." Nearly fourteen years later, Beckett wrote to Mania Péron, the widow of his friend Alfred, "I am in the shit fontanelle deep: rehearsals every day, translations on all sides, people to see. I can't keep up". And a month or so after that he wrote to his American lover Pamela Mitchell, "I went to Godot last night for the first time in a long time. Well played, but how I dislike that play now. Full house every night, it's a disease".

The "disease" called En Attendant Godot raged untreated in Paris from its first night at the beginning of 1953, and would soon spread around the world. (When Beckett met Mitchell she was in Paris with a view to securing US rights to the play for her employer.) The thirty-three-year-old expatriate Irish writer who responded gratefully to the offer of an introduction to a French public for whom he did not exist had become, at forty-seven, a succès de scandale in his adopted country. He was already a succès d'estime. Translations of the stories and novels that, writing in the first person and in French, he had produced in a sustained burst of creative effort between 1946 and 1950 were in demand from publishers everywhere. If this was a situation he had not foreseen or done much to bring about – it was due mainly, as far as we can tell from his Letters 1941–1956, to the good offices of women such as his companion, Suzanne Deschevaux-Dumesnil, Péron and Jacoba van Velde, his publisher Jérôme Lindon and critics such as the Maurices Nadeau and Blanchot – no more did he try to put a stop to it. Letters from this period of his first modest acclaim find him firmly declining to promote himself, but as firmly reproaching the all-powerful Simone de Beauvoir for failing in her editorial responsibility to a fellow artist – himself. To be the author of Godot was something else again.

I am no longer the same, and will never again be able to be the same, after what you have done

Success meant little to Beckett beyond a threat to his privacy, and the inevitable incomprehension. Godot did, though, bring its rewards – the encounter with Pamela Mitchell was presumably one. Another was a modest retreat at Ussy-sur-Marne, from where, as Beckett's fame grew, his letters were more and more likely to be sent. (Reclusive he might have been; out of touch or unreachable he was not.) Here he indulged in the blameless pleasures of the unlikely propriétaire ("I am already, do not miss this, eating my own onions . . ."), and, when unable or disinclined to write, busied himself laying waste to his small plot of land, digging, clearing, "pulverizing the pretty charlock with Weedone". In his introduction to this volume – a long and subtly insightful essay in its own right – Dan Gunn assimilates the Beckettian husbandry to "a form of dispossession . . . perhaps closest to the psychic mechanisms and peculiar temporality of mourning". It was also a continuation by other means of the war against the "cut-and-dried segment of sanctity and loveliness" – the well-made poem, novel or play – that Beckett had waged from his beginnings, though never to such effect as during his four-year "siege". And it is in one or two reports from the country (to Mania Péron or Mitchell again) that we can hear, as nowhere else in this book, an after-echo of Molloy or Malone from the novels named after them: "I know all about couch grass, and the fearsome bindweed, and the way to get the dandelion with its root . . . . Apple trees and pear trees shed their fruit barely formed and the currant bushes, as if taken by surprise in order to please me, are going back to the wild".

Beckett was not unresponsive to some of the other circumstances to which Godot gave rise. Late in 1953, far from the boulevards of Montparnasse, Karl-Franz Lembke had staged his own production, in his own translation, in the prison of Lüttringhausen where he was an inmate. "Godot was a triumph! . . . 'Our' Godot, ours, our very own", Lembke wrote excitedly to its author, who was moved to reply,

"In all my life as a man and a writer, nothing like this has ever happened to me . . . . I am no longer the same, and will never again be able to be the same, after what you have done, all of you. In the place where I have always found myself, where I will always find myself, turning round and round, falling over, getting up again, it is no longer wholly dark nor wholly silent."

Not long before, a little closer to home, one Edouard Coester, a successful lawyer who as Edmond Costère was also a composer, wrote to Beckett asking if he could set Godot to music: "There would never be any question of mere background music, but of a work sung from start to finish . . .". Beckett replied politely, no, he didn't think so, "For what is at issue is a speaking whose function is not so much that of having a meaning as of putting up a struggle, poor I hope, against silence, and leading back to it". (A piece of "pure" music, inspired by the play, would be something else – "And then what about silence itself, is it not still waiting for its musician?".) There is a fairly banal sense in which all Beckett's writing – all writing – is a struggle against silence, and leads back to it. It is Beckett's qualification, "poor I hope", that alerts us to something out of the ordinary. The young Beckett, a disciple of Joyce (the Joyce of "Work in Progress" rather than Ulysses), a

brilliant, learned, polyglot literary experimentalist and a busy translator of Surrealist poems and essays, had declared his fidelity to "the incoherent continuum as expressed by, say, Rimbaud and Beethoven . . . the terms of whose statements serve merely to delimit the reality of the insane areas of silence, whose audibilities are no more than punctuation in a statement of silences", as his protagonist/mouthpiece Belacqua puts it, in the novel Dream of Fair to Middling Women, written in 1932 (it remained unpublished till after Beckett's death). Silence that expressed the inexpressible, hinting at a convulsive unreason beyond the reach of art – of realist art anyway – became the condition that circumscribes all speech, all life. In between there occurred six years of world war, a convulsion of unreasoning violence on an unprecedented scale.

The first letter in this new volume dates from 1945. From 1942 Beckett and Suzanne were in hiding in unoccupied France after the Resistance cell to which he had been recruited by Alfred Péron was betrayed to the Gestapo. Péron, along with many of Beckett's other friends, did not survive. Beckett was profoundly marked by the horrors of war and Occupation – just how profoundly, the editors point out, is attested by the fact that he did not refer to them anywhere, with the exception of a radio broadcast paying tribute to the work of the Irish Red Cross in Saint-Lô in Normandy, where Beckett was a volunteer in 1945–6: "some of those who were in Saint-Lô will come home realising that they got at least as good as they gave, that they got indeed what they could hardly give, a vision and sense of a time-honoured conception of humanity in ruins, and perhaps even an inkling of the terms in which our condition is to be thought again". This "vision and sense" and the experiences that gave rise to it, never explicitly touched on, nonetheless haunt everything Beckett subsequently created: worlds in which unexplained disappearances and displacements, systematized cruelty and the eruption of brutal, seemingly unmotivated violence are only to be expected. And, Gunn suggests, they haunt his letters too:

"gone – or almost – are the fizzing tirades of the early years, the self-pity, the rancour, the occasional self-indulgent displays of cleverness, almost as if so much suffering had put the cap forever on a merely personal expression of disadvantage or misprision . . . . As if bitterness had been transmuted into something more deeply reflective: not an acceptance of horror and injustice, but an acceptance of the communality of loss and the reversibility of the roles of victim and persecutor."

With Péron, the most important loss Beckett suffered in the war years was probably that of the non-combatant Joyce, who died, aged fifty-eight, in 1941. Of him Beckett said "The more Joyce knew, the more he could". From this, an ideal of art as omniscience, supreme adequacy and repleteness, Beckett turned towards one of, as he put it, ignorance and impotence, the art of "a non-know-er, a non-can-er". Four novellas, the novels Mercier et Camier, Molloy, Malone meurt and L'Innommable, and two plays (the suppressed Eleuthéria as well as Godot) followed, each composed in about six months, except for L'Innommable, which presented greater difficulties. To their author, whose creative life had hitherto been characterized by false starts, paralysis and self-confessed indigence, nothing (including his own survival) could have seemed less ordained.

Indigence, confusion, inexplicable compulsion, the terrible comedy of human resourcefulness: these are the matter of the French stories and novels, whose manner is an exhaustive inventory of self and circumstances but whose protagonist/narrators are serially dispossessed of habitation, mobility, life and function apart from, apparently, that of writing or speech. Whatever these works in fact owe to Beckett's wide literary culture, they seem without precedent in literature, and have, in their contingency, their "impossibility", the character of an unjustifiable fact. The younger Beckett would have attempted both to affirm and to negate them with knowing self-mockery. But now he elaborated, in letters written to Georges Duthuit between 1948 and '51, ostensibly about modern painting and especially the Dutchman Bram van Velde, an aesthetic of failure, renunciation, falling short; a theory of art ("Does there exist, can there exist, or not, a painting that is poor, undisguisedly useless, incapable of any image whatever, a painting whose necessity does not seek to justify itself?") that might accommodate the paradoxical existence not just of van Velde's works, but of his own as well.

Beckett had first met van Velde in 1937. “It was dreadful”, he told Charles Juliet (Conversations with Samuel Beckett and Bram van Velde, 1995). “Bram was living in terrible poverty, all alone in his studio with his paintings, which he was showing to nobody. He had just lost his wife and was so dejected . . . . He let me get a little closer to him.” For his part van Velde told Juliet, “Meeting Beckett was a truly miraculous stroke of luck . . . . If I hadn’t had Beckett in 1940, I’m not so sure I could have stood it”, and, unequivocally, “The friendship with Beckett is the most important event in my life”. In the 1970s, when these conversations took place, van Velde spoke of painting in terms that are interchangeable with Beckett’s: “You can’t know anything. Knowledge is no use”, “Failure is more common than success. In painting as in life”, “You have to be devoid of all resources”, “[These gouaches] . . . derive from life. They are born of the unknown – and not of habit, or know-how, or intention, or some recipe”. Forty years before, when Beckett became the principal exponent of van Velde’s art (there were not many others), he and Bram were both known for their silences, their extreme diffidence, and an asceticism that was only partly enforced. Both soon attracted the attention of Duthuit, the cultured and charismatic art historian who revived and edited Transition after the Second World War.

French is the language of the infinitesimal

He found in Beckett an indefatigable (and mostly anonymous) translator of prose and verse for the magazine, and in turn seems to have acted as goad, confessor and confidant. Duthuit’s son described his father’s relationship with Beckett as “volcanique” and Beckett’s long letters to him, often apparently written in the small hours with drink taken, are full of trust, affection and exasperation. Encouraged but not indulged by the older man, Beckett, unable or unwilling to talk about himself, can, as he ruefully admits, talk about nothing else – whether in general terms: “It is all in the old sentence from Geulincx quoted in Murphy, Ubi nihil vales ibi nihil velis [Where you are worth nothing may you also wish for nothing]”, or when he tries to articulate why van Velde is so important to him: “[his] painting is new because it is the first to repudiate relation in all these forms . . . . There is, if you like, refusal and refusal to accept refusal . . . . For my part, it is the gran rifiuto that interests me, not the heroic wrigglings to which we owe this splendid thing”, or even more explicitly addresses his own abnegation of will, desire, ambition, his sense of being beyond any predicament, any “position” he might provisionally adopt:

“I do not know what it is (being in it discourages you from knowing), but I know that it is a great consolation, for everything, everywhere, above all in front of the blank page, and I badly need to be consoled: I am proud, but not proud in that way. Is my strength ebbing away? Fine . . . . Anything that lessens me, starting with my precious memories, makes access to it easier. I shall be running no risks by living in it – I shall hardly have time to be born in it. And no doubt it will be at that birth that, at last, the work will have to stop . . . . One ceases. But with the help, all the same, of another being who, if he is never to find expression (and who knows?) is nonetheless heavily involved in . . . the business. If that is what death is, let’s have it.”

As will be clear, these are difficult, densely written letters, in which Beckett seeks, not so much to explain himself as explain to himself something he has already done, and simultaneously pre-empt the more publishable essay Duthuit had asked for. His ideas – and some of his sentences – were indeed distilled into the “Three Dialogues” on art that made their first appearance in Transition, but we are as yet a long way from the clowning and the suavely uncompromising dicta of those published exchanges: “nothing to express, nothing with which to express, nothing from which to express, no power to express, no desire to express, together with the obligation to express” being the best known.

“Never understood so clearly as when reading you, not even when reading Proust”, Beckett wrote in a ps. to Duthuit, “to what extent French is the language of the infinitesimal.” At least half of the letters in this volume, including (or above all) those to Duthuit, were originally written in French. Their translator, George Craig, was commissioned to review Pour finir encore et autres foirades, a collection of Beckett’s brief late pieces, for the TLS in the 1970s. He duly submitted his review, which failed to appear, as did proofs. At length “a senior figure” explained the error that had caused the delay, and sent him For to end yet again and other fizzles,

Beckett's own translation of the work, wanting to know "if it was different from Pour finir encore". "If I could have answered that question", says Craig, "everything that needed to be known about Samuel Beckett would be known."

Well, perhaps. But whether or not that is strictly true, the question why Beckett moved into French was one he himself remained unwilling or unable to answer, beyond some guarded or throwaway responses to researchers' enquiries. The eloquently incorrect "Pour faire remarquer moi" is the most disarming of these, less to be expected anyway than his reply to one such enquiry here (in February 1954), to the effect that "It was not deliberate. It was in order to change, to see, nothing more complicated than that . . . . I will all the same give you one clue: the need to be ill-equipped". Short of Beckett himself, his letters could hardly have found a better-equipped translator than Craig, or a more painstaking one. Craig's accounts – in his translator's preface to this new volume, and in Writing Beckett's Letters, the latest in the attractive "Cahiers" series also edited by Gunn – of the challenges he faced, from the near-illegibility of Beckett's hand to the idiosyncrasies of his syntax, bespeak the great resources he has deployed in rising to them. (One tiny example of his ear for French idiom and for Beckett's way with it: one of the Textes pour rien, Beckett tells Mania Péron, "est en mauvaise voie", which becomes "is ill on the way", not merely going badly but, as it were, with a galloping badness.) Those resources might not be called on again to such intense effect once the Duthuit correspondence has petered out, but it would be an unusually demanding reader who felt they had been short-changed.

In agreeing to publication of his letters, Beckett stipulated that only those "having bearing on [his] work" should be published, and his executors have adhered to this principle with some rigour. The first volume, Letters 1929–1940 (2009), printed 60 per cent of the total number available from the period, and was "fraught with difficulties of interpretation" for the editors, they tell us in the general introduction to this one. Whatever was left out, the majority of those earlier published letters were to Tom MacGreevy; many related Beckett's excited discoveries as he stood in the art galleries of London, Dresden or Munich. Almost all of them simultaneously revealed a great deal about the young Beckett, and had the greatest possible bearing on his work – especially the work still to come. In one of numerous possible examples, Beckett admits to "fatuous torments . . . a composition that was invalid from the word 'go'" and to "sweats & shudders & panics & rages & rigours & heartburstings", and in the same letter asks, far from rhetorically, "Is there some way of devoting pain & monstrosity & incapacitation to the service of a demanding cause?". From one point of view, his life was spent doing exactly that.

For Letters 1941–1956 the editors have selected only 40 per cent of the total available – though it contains more letters than the earlier volume, to a greater number of people. The fact is that Beckett wrote more letters and, the editors point out, "had more correspondents in the post-War period, and more of his letters were kept". This time, we are told, selection was more straightforward, as "there is much more work produced in these years, and Beckett is concerned in his letters with little else . . . . There remain only a very few letters which the editors would have included but which were not approved". For readers, what matters is the way in which a given letter has bearing on the work, or what kind of bearing it has. Once Beckett's writings had begun, in the early 1950s, to arrive between the austere covers of Les Éditions de Minuit and, not long after, those of Grove Press, he was corresponding regularly with publishers and putative translators. (And, after the noisier arrival of Godot, with producers, directors and actors as well.) Sure enough, to all of them he made some startlingly direct comments on the works. "Molloy . . . won't go into English, I don't know why. It would have to be entirely rethought and rewritten which is I fear a job only myself can undertake . . . . My English is queer"; "I want a theatre reduced to its own means, speech and acting, without painting, without music, without embellishments. That is Protestantism if you like, we are what we are"; "Time that stands still, that skips over whole lives, space no easier to cross than the head of a pin, these are perhaps the true false gods of [Godot], if it absolutely has to have some". Sometimes the focus narrows to the infinitesimal: "'Toute imparfaite qu'elle fût' is in my view a serious imperfection, and I have left the indicative".

All this is invaluable, from almost any point of view. Inevitably, though, more and more of the letters are given to addressing business matters, rights and contracts for translations – which Beckett initially regards as a necessary chore, less trouble than correcting someone else's attempts – and editions. This can be wearying, if never more so than to Beckett himself, for whom stoicism and self-disgust go hand in hand as "the obligation to express" is all but overwhelmed by obligations of a very different kind.

Punctilious in all these dealings, continuing to bring a laser-like attention to verbal or theatrical details, implacable (but not unyielding) with regard to the integrity of his texts, professing distaste for what he has written and fatigue at the thought of writing anything new: this is Beckett as we already imagined him, or knew him from the biographies. It seems legitimate to wonder whether any of those "very few letters which the editors would have included" might have shown him in a different light, or had a different kind of bearing on his work. They are unlikely to have been of the kind whose publication could have given offence, since this time, the editors remind us, Beckett "is no longer a young writer making his way, impatient of others' failure to give him recognition, irritated by the success of authors of whom he is contemptuous". The internal evidence points rather to some of Beckett's letters to Pamela Mitchell, since in this respect we can perhaps know him slightly better from the biographies – from James Knowlson's, anyway. His Damned to Fame includes passages from letters that either do not appear at all, or appear truncated, in Letters 1941–1956. There is no telling whether the missing material amounts to much or little, but as far as the passages Knowlson quotes are concerned, readers have had access to them since 1996, so their suppression here is hard to understand. If it is due to a desire to respect Beckett's wishes, it was misguided. As we can read in Damned to Fame but not in this volume, in November 1954, sunk in grief for his brother, in guilt and remorse (it was clear to him that "things" did not include his affair with her), Beckett wrote to Mitchell:

"For me things must go on as they are. I have not enough life left in me even to want to change them . . . . The notion of happiness has no meaning at all for me any more. All I want is to be in the silence . . . . Don't imagine I don't feel your unhappiness. I think of it every hour, with misery . . . . You will be happy one day and thank me for not involving you any deeper in my horrors."

Painful as this is to read, it can hardly be said to have no bearing on Beckett's work – on Fin de partie that was gestating, on Krapp's Last Tape, Comment c'est, Play or Eh Joe.Behind that "even to want to change them" whisper the lines from Leopardi, "non che la speme, il desiderio e spento", to which Beckett all his life expressed himself indebted.

A handful of letters that are included here concern losses that were not communal at all, but acutely personal to Beckett: of his mother and brother, who both died in this period. Again, these letters have a bearing on the work that is, to say the least, equal to that of anything Beckett wrote to Roger Blin or Barney Rosset or Minuit's proofreader. They are also very beautiful:

"I keep watching my mother's eyes, never so blue, so stupefied, so heartrending, eyes of an endless childhood, that of old age. Let us get there rather earlier, while there are still refusals we can make. I think these are the first eyes that I have seen. I have no wish to see any others, I have all I need for loving and weeping, I know now what is going to close, and open inside me . . . ."

– Beckett wrote to Duthuit on one of his visits home to Ireland when his mother had begun to fail. (The death of a mother is the central revisited event in Krapp's Last Tape, 1958, for which Beckett returned to his mother tongue for the first time – outside letters and translations – in twelve years.) From Ireland again, where he had gone to be with his brother in the latter's last weeks, he wrote to Mitchell, "So it goes, with great ingratitude for such a great thing as to be able to rise and move from one's place, if only a few sad steps". Less the lover's sad steps, as in the sonnet by Philip Sidney, than those from mourning to melancholia: "melancholy mad" is the phrase Beckett uses in gently distancing himself from the woman whom he simultaneously recalls with longing.

The same radical dissociation between self and other, self and world ("There is more than a difference of degree between being short, short of the world, short of self, and being without these esteemed commodities") is assumed by Beckett's writing from beginning to end; only, at a particular moment he found the means by which to express it, instead of being "incapacitated" by it. The inescapable logic of that expression, like the personal reality it embodies ("the most you can hope is to be a little less, in the end, the creature you were in the beginning, and the middle"), only looks like an impoverishment to those who have more of both self and world than they know what to do with. Yet few modernist writers speak with such intensity as Beckett does of what was his to love; or have felt so keenly the impossibility of speech and, at the same time, its beauties and exactions. Beckett's own gran rifiuto, his "poor" struggle against silence, was compelled by an intuition of what he calls here "the impossible that we are, impossible living creatures, impossibly alive, of whom neither the time of the body, nor the investment by space are any more to be retained than the shades of evening or the beloved face". As Gunn says, the writings in which he gave voice to this "would change our very conception of the literary". Biographers and scholars have done much to help us understand those writings' background, their sources both literary and personal. What it meant to be their author, though, becomes clearer and clearer with the publication of his letters, which restore to the foreground an artist who was neither a secular saint nor the seminar-haunting purveyor of postmodern nostrums that some academic work has willed into being. The accompanying translations, introductions, notes (there are one or two slips or uncertainties over dating, but these hardly signify), chronologies and profiles of the principal correspondents make of this volume, like its predecessor, an embarras de richesses. It is one for which we are greatly in the editors' debt.

Alan Jenkins is Deputy editor and Poetry editor of the TLS. Blue Days (The Sailor's Return), poems, appeared last year.

http://www.the-tls.co.uk/tls/public/article812332.ece

Switching Senses: Leeches Shift the Way They Locate Prey in Adulthood

This montage of a leech shows it using shadows from waves passing overhead to find its prey. (Credit: California Institute of Technology)

ScienceDaily (Nov. 1, 2011) — Many meat-eating animals have unique ways of hunting down a meal using their senses. To find a tasty treat, bats use echolocation, snakes rely on infrared vision, and owls take advantage of the concave feathers on their faces, the better to help them hear possible prey. Leeches have not just one but two distinct ways of detecting dinner, and, according to new findings from biologists at the California Institute of Technology (Caltech), their preferred method changes as they age.

Medicinal leeches, like many aquatic animals, use water disturbances to help them find a meal. Juvenile leeches eat the blood of fish and amphibians, while adults opt for blood meals from the more nutritious mammals. Since it was known that leeches change their food sources as they develop, the Caltech team wanted to know if the way they sense potential food changed as well. Their findings are outlined in a paper now available online in the *Journal of Experimental Biology*.

The group set up experiments to test how much leeches rely on each of the two sensory modalities they use to find food: hairs on their bodies that can note disturbances in the water made by prey moving through it and simple eyes that can pick up on the passing shadows that those waves make. They monitored both juvenile and adult leeches as they reacted to mechanical waves in a tank of water or to passing shadows, as well as to a combination of the two stimuli. The leeches in both age groups responded in similar ways when only one stimulus was present. But when both waves and shadows existed, the adult leeches responded solely to the waves.

"We knew that there was a developmental switch in what kind of prey they go after," says Daniel Wagenaar, senior author of the paper and Broad Senior Research Fellow in Brain Circuitry at Caltech. "So when we saw a difference in the source of disturbances that the juveniles go after relative to the adults, we thought 'great -- it's probably matching what we know.'"

However, the team was very surprised to see that the individual sensory modalities aren't modified during development to help decipher different types of prey. The leech's visual system doesn't really change as the

animal matures; neither does the mechanical system. What does change, however, is the integration of the visual and mechanical cues to make a final behavioral decision.

"As they mature, the animals basically start paying attention to one sense more than the other," explains Cynthia Harley, lead author of the study and a postdoctoral scholar in biology at Caltech. She says that the team will now focus their studies on the adult leeches to learn more about how this sensory information is processed both at the behavioral and cellular levels.

Paper coauthor Javier Cienfuegos, now a freshman at Yale, contributed to the study while a high school student at the Polytechnic School, which is located next to Caltech's campus. He ran about half of the experimental trials and was "instrumental in the success of the study," says Harley.

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Journal Reference:

1. C. M. Harley, J. Cienfuegos, D. A. Wagenaar. **Developmentally regulated multisensory integration for prey localization in the medicinal leech**. *Journal of Experimental Biology*, 2011; 214 (22): 3801 DOI: 10.1242/jeb.059618

http://www.sciencedaily.com/releases/2011/11/111101141343.htm

Inside the secret library where East meets West
Marina Warner

Alastair Hamilton
THE ARCADIAN LIBRARY
Western appreciation of Arab and Islamic civilization
416pp. Oxford University Press. £120 (US $250).
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T he Caliph Harun al-Rashid enjoyed disguising himself in order to roam the streets of his capital, Baghdad, listen in on the doings of his subjects, and discover their unguarded thoughts and feelings. In several of the stories in the Arabian Nights, fantastic revelations of romance and misadventure require the Caliph to drop his cover in order to dispense justice and mercy and put the world to rights. The collector who has created the Arcadian Library is likewise incognito, and although his identity is known to some members of a very small circle, the secret is well kept, and so far he has not felt the need to reveal himself (he was present at the opening of the exhibition inspired by the Library, The Bridge of Knowledge, held at the School of Oriental and African Studies in London earlier this year, but invisible to the company). With the help of the bibliophile Robert Jones and of Alastair Hamilton, the author of this sumptuous survey, this secret collector has assembled one of the most princely of contemporary private libraries, and what must also count as one of the finest dedicated collections of books ever made about Western entanglement with the Middle East.

The Library's purpose is "to represent through books the relationship and the ties that have bound European culture for so many centuries to the neighbouring Arab and Islamic world", and Hamilton's account testifies to underexplored dimensions of exchange and cross-fertilization, much of them far more appreciative and therefore fruitful than the current perspective common ignorance perpetuates, and certainly far surpassing the assumptions of most of our political leaders.

The earliest items are medieval manuscripts, but there are also many incunables, translations of Avicenna and Arabic originals, printed in Venice and Padua; the more recent items include de luxe editions of the Arabian

Nights, such as the white vellum, gold-tooled presentation volumes illustrated in luscious colour by Edmund Dulac. The books rise floor to ceiling in two lofty rooms, with a custom-made emerald carpet woven with lily-of-the-valley posies, the colophon of the Library, and a tribute to the flower that grew under the cedars of Lebanon. The volumes' beautiful bindings glow in the penumbra protecting them from light damage; a panorama of Cairo, printed in Venice in 1549, and one of the two impressions still extant, is hung off the main reading room (it is the subject of Nicholas Warner's fascinating study The True Description of Cairo, published in three volumes earlier in the same series, "Studies in the Arcadian Library"). Visiting the Library is by introduction; it is free. Its location is not advertised and indeed, can't be discovered from the publication details of this book or of any others in the series (the most recent is Robert Irwin's treasure trove about the illustrators of the Arabian Nights, Visions of the Jinn, 2010); it does not reveal its whereabouts on the internet. As a private library, it's unusual because it has its own independent premises and is not established in the collector's house.

Reviewing this book, I must declare an interest – that I have worked at the Library and received generous help with reproductions of the holdings. The experience returns one to a scholar-king's cabinet – to the palace of one of the cultivated Enlightenment rulers, for instance. It is appropriate that some of the books came from William Beckford's library. But the atmosphere is closer to a shrine, a grail chapel, and you feel, when you are there, usually alone with the books and the library staff, that you have been admitted by Lady Fortune to one of her favourites' secret sanctums where wisdom is truly to be revealed.

British history was shaped by these encounters in an underexamined process of reverse colonization

Alastair Hamilton is a leading Arabist and scholar of other Oriental languages; he recently returned from the Netherlands to the Warburg Institute, London, and has a rare range, having been Professor of the History of Ideas at the University of Leiden and of the History of the Radical Reformation at the University of Amsterdam; he's written a history of the Copts in Egypt, has worked on the Qur'an and its translations, and recently brought out, again for the Arcadian Library, an unprecedented exploration of the architecture of Oman. The Arcadian Library takes the form of a guide to the collections, not a bibliographical catalogue, although fascinating detail abounds; Hamilton's lucid, graceful commentary and proofing also seem to belong to an age of exactitude and elegance that are luxuries beyond most of our reach today.

Above all, like its forerunners in the series, this large-format volume is illustrated with full-colour plates even when the original material is monochrome, so that the ridges of the paper in the original book, the uneven impress of the type, the pressure of the burin, the wear and shading on the page, are all subtly and richly revealed. Especially magnificent are the gatefold sections, which make it possible to disclose in immaculate detail such rarely exhibited works as Melchior Lorck's idiosyncratic records (dating from the mid-sixteenth century) of Ottoman uniforms and customs, Anton Ignaz Melling's absorbed record of "The Sultan processing on the feast of Bairam" in Istanbul, 1819, and the delicate, almost gemütlich portraits of Ottoman grandees by Louis Dupré, six years later.

It is difficult to convey how unusually beautiful the books in the Arcadian Library series are, how they reproduce and communicate a neglected history of contact in numerous spheres of activity, and how they testify to the collection's commitment to the tradition of book-making as a historical art, the equal of any other. In this respect as well as in others, the library honours the tradition of the Middle East, where scriptural artefacts command special honour and shape aesthetics more generally: architecture becomes calligraphy, clothing comprises documents, jewellery is inscribed with texts: the world aspires to the condition of a book, preferably finely bound.

In a poignant and lyrical film, The Dove's Lost Necklace (1992), the Sufi-inspired Tunisian-French filmmaker and storyteller Nacer Khemir lovingly dramatized the life of a bookshop and bookseller, of scribes and poets, in an Arab town in some undefined historical period; he filmed in Sousse and other parts of his country, including the ravishing oases of the desert, and as the story unfolds, an unnamed band of fanatical

marauders smashes this cultured society. The film is an allegory that foreshadows the vision of the Arab Spring and its fears of sabotage by enemies, both indigenous and foreign. The Arcadian Library also stands up for a historical Islamic civilization from a similar historical perspective: in his introduction, Robert Jones reveals that the collector had a Sufi grandmother "who advised that one should always live one's life in pursuit of dynamic cultural variety".

Hamilton has organized his account thematically, beginning with the Library's strength in travel writings – by pilgrims to the Holy Land, merchants (real-life counterparts of Sinbad and Maruf the Cobbler), archaeologists, journeyman artists, diplomats like the celebrated Augier Ghislain de Busbecq (he doubts the tradition that Busbecq brought the first tulips to Europe, but does allow him to have introduced sedge and lilac) – and the many women who found the Orient irresistible. But the encounter did not only transport them to the wilder shores of love, as the late Lesley Blanch put it. British history on many fronts was shaped by these encounters in an underexamined process of reverse colonization: Lady Anne Blunt (Byron's daughter) became an expert in breeding Arabian horses and brought the stock to the racing stables of England. Hamilton also explores the imperial enterprise in the region: Gertrude Bell was "one of the architects of modern Iraq", and Curzon also makes an appearance – en route to India, he gave a speech at Sharja in 1903 to the rulers of the Trucial States (present-day Oman and the UAE), reminding them of the benefits of friendship with Britain (the Library has the translation into Arabic).

After the travellers and their reports, visual and written, the next section focuses on "Turcica", or materials from or about the Ottoman Empire: this opens with a papal indulgence, printed in 1482, remitting the sins of donors to the war against the Turks. It is a sobering fact that the earliest printed presses were devoted not to mass-producing works of learning to enlighten the populace, but to marketing vast quantities of such propaganda. The rich cross-correspondences in science and medicine form the focus of the central, third section, which ranges from the copyists of Baghdad and Granada who preserved, in Arabic, so much of the precious knowledge of antiquity, to the original herbalists, doctors, astronomers of Andalusia and the Maghreb – the Library has very rare copies of the pioneering surgical work of the twelfth century composed by Avenzohar (Abu Malik 'abd al-Malik ibn Zuhr) at the request of Averroes, and a worn, immensely evocative tenth-century manuscript of the famous astrological treatise by Albumasar (whose name has survived, deformed, in the panto villain of Aladdin, Abu Maza the African magician).

When Hamilton turns to Islam, he is on territory where he is uniquely knowledgeable, and the story of encounter becomes more complex, with fluctuations in relations, from rank and inflammatory denunciations of the Prophet and his followers to "considerable respect for its practitioners". Inter-Christian hostilities sparked different views of Islamic Scripture. The story of the Qur'an in translation involves unexpected appearances – of both Luther and Melanchthon on the title page of translations, for example. They supported a German version of the Qur'an, the better to criticize it, and wrote forewords in which they seized the chance to denounce Catholicism for its alleged resemblances to Islam. Catholics in turn levelled a similar charge against Protestants. The business became so fraught, especially after translators kept dying young, that a legend grew up of a curse visited on "Christians meddling with the Qur'an". The history, Hamilton writes, remains a bibliographer's nightmare.

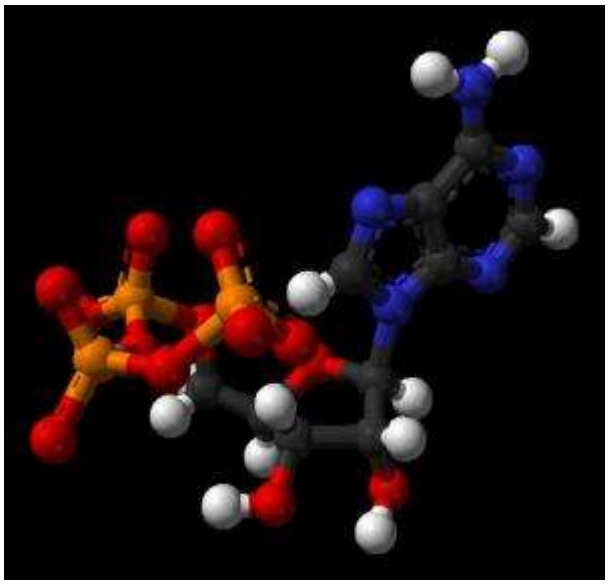
The Arcadian collection of editions of the Arabian Nights is one of the most multitudinous in the world, in keeping with the tales themselves. They were the reason for my visiting the Library in the first place, and the sight of the towering bookcase, dedicated to this accumulation of volumes from the first translation (l704–21) by Antoine Galland onwards, in differently coloured fine bindings, made me gasp like a seeker in one of the stories discovering the egg of the giant roc in its nest. The Arcadian Library does not need to expand on these holdings; it does, however, reproduce some of the illustrations on another glorious gatefold, and it pictures a scattering of pages from a bundle of seventeenth-century manuscript notebooks in which stories of the Nights are told. These have been annotated with exclamations and invocations of the owner, and survive between battered boards, the pages' edges carefully patched here and there to preserve them. Perhaps they belonged to an itinerant storyteller, a hakawati, as Nacer Khemir calls himself; they have been lovingly read to bits.

With this lavish study of the Arcadian Library, it is to be hoped that a similar process has begun. As readers discover the knowledge assembled in the collection, it can start to flow and spread through our consciousness, altering many received ideas about the relations between East and West.

Marina Warner teaches Literature at the University of Essex and is the author, most recently, of Stranger Magic: Charmed states and the Arabian Nights, which is published this month.

http://www.the-tls.co.uk/tls/public/article812318.ece

Workings of Molecular Motor Revealed



Ball-and-stick model of adenosine triphosphate (ATP). (Credit: Ben Mills via Wikimedia Commons, public domain.)

ScienceDaily (Nov. 1, 2011) — The structure and function of a 'molecular motor' critical to the functioning of human organs and, when malfunctioning, implicated in cancer, kidney failure, and osteoporosis, has been revealed in unprecedented detail.

An international team, led by chemists from Oxford University, has used highly sensitive mass-spectrometry to piece together a picture of how the motor, the energy-converting protein adenosine triphosphate (ATP) synthase, interacts with the fatty acids that form the membranes around our cells.

The team publish a report of the research in this week's *Science*.

'ATP synthase is found in every cell in our bodies and generates the energy necessary to keep our organs working,' said Professor Carol Robinson of Oxford University's Department of Chemistry, an author of the paper. 'Our team were able to effectively 'weigh' this molecular motor and calculate the exact weight of the fatty acids -- that act rather like a 'lubricant' for the motor -- that are attached to it.'

The researchers probed ATP synthase and its various component parts by stimulating it with high pH and different levels of ATP and Adenosine diphosphate (ADP). They were then able to watch how the different parts of this molecular motor responded and interacted in the kind of detail nobody has seen before

The team believe their discovery will be extremely important for future research into a wide range of diseases in which defects in such energy-converting machinery plays a part.

Professor Robinson said: 'Overall this research has not only contributed to our understanding of this cellular motor but also highlights opportunities to explore the effects of inhibitors that could one day help in the treatment of many conditions.'

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Story Source:

The above story is reprinted from materials provided by **University of Oxford**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/11/111101223107.htm

How John Martin saw the end of the world

Kelly Grovier

John Martin
APOCALYPSE
Tate Britain, until January 15, 2012

Published: 2 November 2011

I n 1841, Isambard Kingdom Brunel set out to establish how fast a train could go by staging a locomotive sprint from Southall to Slough. Authorities were charged with clearing the nine miles of line and ensuring onlookers remained at a safe distance. Joining Brunel on the footplate was an unlikely pair of luminaries: the scientist and inventor Charles Wheatstone, who had previously tried to measure the speed of light, and, more curiously still, a fifty-two-year-old painter called John Martin, who had unsettled the nation's imagination for the past thirty years with incendiary canvases depicting everything from "The Destruction of Pompeii and Herculaneum" to the twilit wanderings of "The Last Man". For a moment, as the train reached the unprecedented speed of over 90 mph, Martin was among the fastest-moving men in the history of the world. Over a century and a half later, Tate Britain's formidable new exhibition John Martin: Apocalypse, comprising six rooms and over one hundred paintings, drawings, etchings and prints, chronicles Martin's rapid acceleration into cultural consciousness and allows the visitor to assess the success of an artist, once hailed as "the most universally popular painter of the day", who felt he was forever locked in a race for acclaim with his contemporary, J. M. W. Turner.

That Martin was, almost from the start of his career, drawn to scenes of impending peril is apparent from the works in the first room of the exhibition, which organize themselves around the artist's early breakthrough, "Sadak in Search of the Waters of Oblivion" (1812). Inspired by an episode in James Ridely's Orientalist pastiche The Tales of the Genii (1764), Martin captures the moment when the muscular Sadak, swaddled in vermillion mist, teeters on a precipice – seconds away from either safety or annihilation. Unusually for a landscape of the period, the large canvas has been flipped upright – a third taller than it is wide – thus magnifying the vertiginous cascade of smouldering mountain into steamy waterfall and ensuring the work would disturb the tranquil walls of the Royal Academy's Great Room, where it was first exhibited in 1812. So

unconventional was the work's orientation that porters entrusted with hanging the painting were overheard arguing over which way was up, and the innovative scaling still has the power to startle. So too does the warm otherworldly light that ignites the scene, as though the canvas were lit from behind. Commending the work's remarkable energy, while at the same time initiating a rivalry that would gather pace for the rest of Martin's life, an early reviewer for Leigh Hunt's Examiner remarked how "the mass of fiery light on the mountain" would likewise "afford a sublime treat from the hand of Mr Turner", who that year unveiled his turbulent masterpiece "Snow Storm: Hannibal and his army crossing the Alps".

Born in Northumberland in 1789 (the same week the Bastille fell in Paris), Martin was the youngest of thirteen children born to poor odd-jobbing parents. He had no formal training in art when he moved to London at the age of seventeen to earn a living painting china and glass. While only a small ceramic plate has survived from this early stage, its enamelled depiction of an ivory city, whose smooth visionary domes are poised precariously on a sheer cliff while an insinuation of steep crags snarls in the distance, seems a sign of things to come. The success of "Sadak", which sold for fifty guineas to a West India merchant and Member of Parliament, encouraged a creative groove from which Martin would hardly swerve for the next forty years. The incandescence first kindled in that seminal work engulfs the paintings that dominate the second room of the exhibition, where the visitor's eye is initially drawn to a nearly eight-foot-wide biblical scene, "Joshua Commanding the Sun to Stand Still Upon Gideon" (1816) – an Old Testament subject many contemporaries understood as prefiguring the apocalyptic meteorology awaiting man on the Day of Judgement. Martin's most conspicuously Turneresque canvas – its darkening vortex of rock and cloud echoing his rival's recent depiction of Hannibal's trek – the painting's mesmerizing blur of history and prophecy helped elevate Martin to the level of living sage. His work began to feel less like illustration and more like vatic flashes of cataclysms to come. The eruption in April 1815 of Indonesia's Mount Tambora, which triggered the dreary "year without a summer" throughout the Northern Hemisphere – incubating Mary Shelley's Frankenstein and John Polidori's The Vampyre – may have made contemporary consciousness even more susceptible to the urgency of Martin's melodramatic visions.

Martin tapped into visceral fears of annihilation

Over the next seven years, Martin produced a succession of alarmist canvases, from "The Fall of Babylon" in 1819 to "The Destruction of Pompeii and Herculaneum" in 1822 (the latter ironically suffering a disastrous fate when a flood in 1928 ripped it in two). By now he had mastered the haemoglobin glow he had first experimented with in "Sadak in Search of the Waters of Oblivion", and which would have such a formative influence on the feverish imaginations of twentieth-century filmmakers (such as D. W. Griffith, Roland Emmerich, Ray Harryhausen and George Lucas). The sensational pieces of this period also help us to measure the aesthetic temperament of the time. Indeed, it was the sprawling nine-foot-wide "Belshazzar's Feast" (1820) which crystallized critical disdain against his style, and influenced for ever the way the public engages with works of visual art. A masterpiece of tonal restraint that gives the illusion of ceaseless spatial depth, Martin's most famous painting (on display for the first time in over twenty years) appears soaked in the very wine Belshazzar serves from the sacred goblets his grandfather stole from the Temple in Jerusalem. The painting distinguishes itself from celebrated precursors of the same subject by Breughel the Elder, Rembrandt, Tintoretto, and Veronese (as well as a contemporaneous effort by the American landscape artist Washington Allston) by the sheer architectural scale of Martin's vision. Where other artists focused on the supernatural writing on the wall (prophesying Belshazzar's imminent fall), Martin's painting moves out from the imperilled figures, who now seem dwarfed by the endlessly collapsing perspective, as the historic fate of Babylon and the future fate of Britain are left to merge in the viewer's mind.

The wide-angle perspective enthralled the public. When the work was exhibited in 1821 at the British Institution, barriers had to be erected to protect it from a crush of visitors, and within two years it had toured nearly every major city in the country. A descriptive pamphlet accompanying the tour, which provided a complex visual key with zigzagging arrows to indicate how one's eyes should move across the work, had forty-two printings, and an assortment of authorized and pirated reproductions of the painting (including

etchings, mezzotints, wood engravings, oil on glass, diorama, and process prints) circulated internationally, making "Belshazzar's Feast" one of the most widely disseminated images of all time. Though his contemporaries would concede the work "made more noise among the mass of people than any picture that has been exhibited", it was also agreed, according to a rival, that "artists and connoisseurs did not like it much". Indeed, the hysteria surrounding Martin's work was reason enough for many intellectuals to be suspicious of its quality, as critics such as Charles Lamb – whose essay "The Barrenness of the Imaginative Faculty in the Productions of Modern Art" summons Martin as a case in point – began dismissing what they saw as the painter's penchant for schlock and awe. "Huge, queer, and tawdry to our eyes", is how Thackeray described Martin's achievement, though James Hogg hailed him as "the greatest painter o' them a'" and Edward Bulwer Lytton insisted that in conception "he is more original, more self-dependent" than either Raphael or Michelangelo.

By the late 1820s, Martin was the most popular painter of the day, eclipsing even Turner, whose compositions he had deliberately echoed in developing his style. Attempting to build on his reputation, he pursued a range of innovative projects, not all of which were artistic or successful. Intrigued by the potential of new modes of reproduction, he accepted a lucrative commission to produce twenty-four mezzotint illustrations for Paradise Lost. Milton's epic was ideally suited to the melodrama of Martin's imagination and the medium appealed to his inventiveness. Room 3 of the exhibition is devoted to these smaller-scale (two-feet-wide) works (such as "Bridge over Chaos", 1824–6, and "Satan Viewing the Ascent to Heaven", 1824–5). The arresting contrasts of darkness and light which characterize the prints reveal Martin to be an unexpected pioneer of the emergent genre of mass-produced prints, and they went some way to winning over critics who doubted his technical skill.

Despite his commercial canniness and the steady trajectory of fame, however, Martin was not proof against poor decisions. Much of the ensuing decade was wasted promoting schemes for civic improvement he would never see realized, several of which are on show here. As though terrified by the vividness of his own prophecies of social collapse and aware of exegetical arguments equating London with Babylon, Martin became obsessed with designs he hoped could forestall man's ruin, including an elaborate sewer system, much-needed flood walls along the Thames embankment (which would have spared his "Destruction of Pompeii and Herculaneum"), and an ingenious underground railway. His dithering derailed his artistic momentum and by 1837, just as Turner was completing his influential decade-long series of Petworth interiors, Martin was bankrupt.

Now in his late forties and desperate to reassert himself as an enduring creative force, Martin returned to the subject he knew best and began peddling the apocalypse again with unwavering vigour. His return to form was heralded by a major exhibition at the Royal Academy in 1840, with a pair of works devoted to the biblical flood. Bathed in a forbidding apricot light and with its astronomically accurate alignment of sun, stars, waning moon, and a comet's tail, "The Eve of the Deluge" (1840) attracted the attention of Prince Albert, who bought it for £350. Martin was now back in profit, exhibiting at the Royal Academy every year from that point until his death in 1854. Works such as "Pandemonium" (1841), with its percolating craters of fire and groaning factory-like architecture, were emphatically of the moment, providing a kind of cautionary backdrop against which the infernos of industrialization were being constructed around the country.

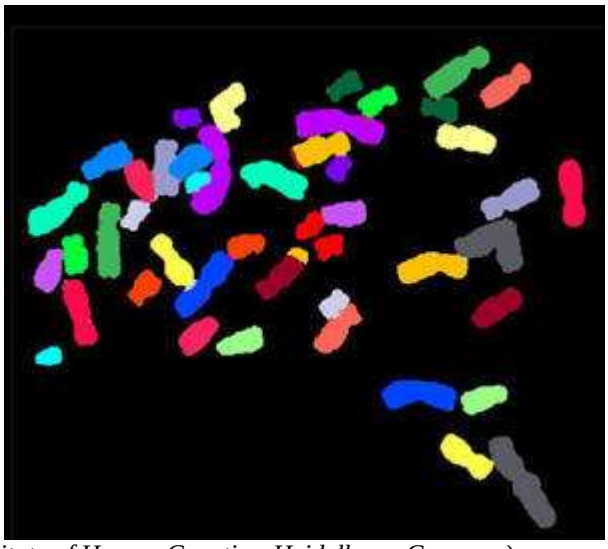
In 1848, Martin moved house to premises near Battersea Bridge, a short walk from Turner's home in Cheyne Walk, Chelsea, and began working in earnest on a triptych he had been planning since the year after Turner's "Rain, Steam, and Speed" was first exhibited in 1844. Comprising three colossal canvases inspired by the Book of Revelation – "The Last Judgement", "The Great Day of His Wrath", and "The Plains of Heaven" – the trio, which Martin completed in 1853, constituted the artist's magnum opus of choreographed catastrophe. The works embarked on an unparalleled worldwide tour which kept them in virtually constant candlelit view in theatres, museums, music halls and council buildings from Dublin to New York, Sydney to Dundee for the next twenty-five years. They are brought dramatically to life every thirty minutes at the Tate, where a son et lumière display, projected on to the paintings themselves, invigorates the static canvases with a collage of

contemporary voiceover, transforming the pieces into motionless films. The effect is powerful and reinforces a suspicion that builds from room to room that while Turner was the more profound artist, finding sublimity in real rather than superstitious light, Martin tapped into visceral fears of annihilation and his influence on future media was deeper. “The Last Judgement” depicts history’s most virtuous figures – poets and painters principally – beneath a host of trumpeting angels while a train, on to whose carriages the names of the world’s great cities have been emblazoned, collapses into the abyss of the painting’s middle ground. Is there an admission of complicity in man’s destruction, as though the artist were still on the footplate of Brunel’s unmanageable machine, or does Martin delight in imagining the steam and speed of his rival’s recent masterpiece falling into oblivion? Following its remarkable international tour, the triptych disappeared into storage, along with Martin’s posthumous reputation, collecting dust for over half a century, while Turner’s fame continued steadily to gather pace. Tate’s Apocalypse provides a compelling sequel to its memorable exhibition Gothic Nightmares in 2006, which also centred on the work of a controversial Romantic artist, Henry Fuseli. By focusing on a painter who divided contemporary opinion as few had before, this remarkable exhibition asks us to consider why some art never fully transcends its time, while nevertheless surviving as a remarkable cultural document of its age – why, in the quiet race between the achievements of John Martin and J. M. W. Turner, the latter will continue forever to win.

Kelly Grovier is the co-founder of the European Romantic Review. His collection of poems The Sleepwalker at Sea was published earlier this year.

http://www.the-tls.co.uk/tls/public/article812257.ece

Growing Without Cell Division: Mechanism Responsible for Cell Polyploidy Pinpointed?



Color-coded chromosomes. (Credit: Anna Jauch, Institute of Human Genetics, Heidelberg, Germany)

ScienceDaily (Nov. 1, 2011) — An international team of scientists, including biologists from the University of North Carolina at Chapel Hill, may have pinpointed for the first time the mechanism responsible for cell polyploidy, a state in which cells contain more than 2 paired sets of chromosomes.

When it comes to human chromosomes and the genes they carry, our tissue cells prefer matched pairs. Bundled within the nucleus of our cells are 46 chromosomes, one set of 23 inherited from each of our parents. Thus, we are known from a cellular standpoint as "diploid" creatures.

But a cellular chromosome situation common in plants and in many insects is polyploidy, in which there are more -- sometimes a lot more -- than two sets of chromosomes. Here, growth occurs through an increase in cell size versus an increase in cell number via cell division (mitosis). This allows more DNA to be crammed into the cell nucleus.

Polyploidy also appears in some tissues of otherwise diploid animals, including people -- for example, in specialized organ tissue such as muscle, placenta, and liver. These biologically highly active tissues also produce large polyploid cells.

An intriguing slice of discovery science led by geneticist Bruce Edgar, PhD of the University of Heidelberg, Germany, was published online on Oct 30, 2011 in the journal *Nature*. The research team may have pinpointed for the first time the regulatory mechanism responsible for cell polyploidy.

Study co-author Robert J. Duronio, PhD, professor of biology and genetics at UNC and a member of the UNC Lineberger Comprehensive Cancer Center said, "Many organisms achieve growth by increasing cell size rather than cell number." He pointed out that many cells of fruit flies (*Drosophila*), for example, enter a specialized cell cycle known as the endocycle, which results in polyploidy. Here mitosis is bypassed and the cell replicates its DNA without undergoing mitosis.

"We mathematically modeled the behavior of molecules known to control this special type of cell cycle and the progression to polyploidy. We then made certain predictions about how these molecules were regulated during the endocycle that we tested in fruit flies."

Duronio said the study demonstrated that genes turned on and off in a cyclical manner was important for cells to continue endocycling and become polyploid. "We showed that one particular perturbation, or mutation, of this mechanism blocked the ability of cells to do that."

The UNC researcher said further research will determine if the findings "… take us one step closer to being able manipulate cells becoming polyploid. And that might be important for, say, liver regeneration or liver diseases, where it's thought that polyploidy in liver cells may be important for liver function, either for liver detoxification or other aspects of liver biology."

UNC biology department co-author along with Duronio was Shusaku T. Shibutani, PhD. Other co-authors are from the German Cancer Research Center in Heidelberg; Fred Hutchinson Cancer Research Center; Friday Harbor Labs, University of Washington; University of Calgary, Alberta, Canada; and the University of Zurich, Zurich, Switzerland.

The research was supported in part by the National Institute of General Medical Sciences, a component of the National Institutes of Health.

Story Source:

The above story is reprinted from materials provided by **University of North Carolina School of Medicine**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/11/111101125955.htm

Hospital Tests Reveal the Secrets of an Egyptian Mummy

Images from the recent CT scans of the mummy show that the child still had some of its baby teeth, with adult teeth coming in. (Credit: Photo by David Hunt, Smithsonian Institution)

ScienceDaily (Nov. 2, 2011) — An ancient Egyptian mummy has had quite an afterlife, traveling more than 6,000 miles, spending six decades in private hands, and finally, in 1989, finding a home at the World Heritage Museum (now the Spurlock Museum) at the University of Illinois. The mummy's travels did not end there, however. It has made two trips to a local hospital -- once in 1990 and again this year -- for some not-so-routine medical exams.

Egyptologists, a radiologist, a pathologist, a physical anthropologist and a mummy expert are using the best diagnostic tools available to learn about the mummy without unwrapping its red linen shroud or cutting into it. The team will discuss its findings during a symposium Nov. 2 at the museum in Urbana, Ill.

The first round of tests in 1990 included X-rays and CT scans, as well as an analysis of tiny fragments of cloth, insects and hardened resins collected from the fraying base of the mummy. Dr. Joseph Barkmeier, medical director of diagnostic services and regional outreach at Carle Foundation Hospital and Physician Group in Urbana, conducted the CT scans at the hospital. He repeated the scans this year at Carle with much-improved CT technology.

"Medical diagnostic technology has experienced tremendous advancements in the past two decades," Barkmeier said. "Image resolution is nearly 10 times greater than it was when we first imaged the mummy in 1990, and we can reconstruct images faster and view them from multiple vantage points."

The scans and an analysis of the materials used in embalming (including carbon-14 dating of a wooden plank that supports the body) found that the mummy was a child of a wealthy family from the Roman period of ancient Egypt.

Examining a digitized mummy constructed from cross-sectional CT scans is similar to actually dissecting it -- with some notable limitations, said Sarah Wisseman, project coordinator of the mummy studies and director of the Program on Ancient Technologies and Archaeological Materials (ATAM) at the Illinois State Archaeological Survey. Wisseman is the author of "The Virtual Mummy," a book about the research.

The scans reveal the bone structure and also show that the embalmers left the brain, the heart and lungs in the body, she said. The images also offer insight into the materials used to stabilize, wrap and "fill out" the body. But they do not provide fine details of the soft tissues that remain, she said. David Hunt, of the Smithsonian Institution's National Museum of Natural History, observed that the child still had some of its baby teeth, with adult teeth coming in. This and evidence that the long bones were still growing at the time of death indicate that the child was 7 to 9 years old, Wisseman said.

Several signs -- including a cracked skull with no evidence of bleeding and the detection of carrion beetles in the body -- suggest that the embalmers "did a crummy job or this body was lying around for a while before it was treated," Wisseman said. If the child died during an epidemic there could have been a lot of corpses to deal with, she said, causing delays or forcing the embalmers to rush.

"All of the evidence, however, suggests that this is a child from a wealthy family," she said. "They're using expensive red pigment from Spain. They're using gold gilt decoration. This is a fairly high-class kid."

Despite the high-tech probing, the mummy has maintained some of its secrets. Its hands are positioned in front of its collapsed pelvis, hiding any evidence of its sex. And DNA tests of a sample collected from the damaged region near its base have yielded no definitive results so far.

There are some "tantalizing" clues to the child's sex in the face portrait attached to the mummy, Wisseman said, but such images can be misleading.

"There's a suggestion around the portrait of a tunic with a stripe on it. This alone would suggest that the child inside is a boy," she said. "But there are other mummies that have one person depicted on the outside and then you discover it's a different sex or even an animal instead of a human, so you can't tell a book by its cover."

The CT scans also revealed something that might be a lock of hair on one side of the child's head, Wisseman said.

"In the Roman period in Egypt, around A.D. 100, we do have examples of Roman face portraits with a shaved head and then a lock of hair on one side," she said. Boys had the lock on one side, girls on the other. But the evidence is not conclusive.

"We may not ever know whether the child was male or female," she said. "And we still don't know the cause of death."

The symposium, "The Return of the Mummy: New Imaging Results on the Spurlock Museum's Egyptian Mummy," will begin at 4 p.m. at the Knight Auditorium, Spurlock Museum, 600 S. Gregory St., Urbana. Admission is free.

Along with Wisseman, Barkmeier and Hunt, other members of the investigative team will speak at the symposium, including Dr. Allan Campbell, clinical professor of pathology and dermatology at the U. of I. College of Medicine at Peoria; Emily Teeter, a research associate at the Oriental Institute museum, University of Chicago; and Carter Lupton, curator of ancient history, Milwaukee Public Museum.

The event is co-sponsored by ATAM and the Dr. Allan C. Campbell Family Distinguished Speaker Series, with research funded in part through the Richard and Barbara Faletti Gallery of African Cultures Fund.

Story Source:

The above story is reprinted from materials provided by **University of Illinois at Urbana-Champaign**.

http://www.sciencedaily.com/releases/2011/11/111102190010.htm

Up There

by Peter Bland; introduced by James Crews

Published: 1 November 2011

Peter Bland began his poetic career exploring the commonplace situations of suburban lives, but his work has evolved to take up issues of relocation and displacement (he has lived off and on in New Zealand as well as in his native Britain). The author of such collections as Domestic Interiors (1964), Mr. Maui (1976) and Paper Boats (1991), Bland has also worked as an actor, which may, in part, explain his ear for the vernacular as well as rhythm; his language is distinctly musical, playful. His delight in coupling seemingly disparate images is on full display in "Up There", a spirited send-up of capitalism and those "tycoons" who profit from it the most.

As the poem gathers momentum, it becomes an extended riff on the much-heard bromide, "It's lonely at the top": though these men inhabit the "splendid isolations" of penthouses, they do so hobbled in "golden wheelchairs", a play on "golden parachutes", severance packages awarded to CEOs on their departure. Here, however, the denizens of business "vanish like Viking Chiefs", suggesting that in spite of the "Rembrandts" and private jets, they too must face death like anyone else. Yet they are not ordinary either; they are "Draculas" – perhaps literature's loneliest of incarnations – and wake at dusk to "salve their secret hurts".

In a time of austerity measures, riots and record unemployment, "Up There" remains relevant. It is tempting to read the poem as a political indictment of the wealthiest members of society, untouched by economic downturns, but to do so would miss Bland's point: by the final stanza, we feel sympathy for these tycoons, paralyzed by privilege. Robert Frost once said "Poetry is about the grief. Politics is about the grievance", and

if there is grievance in Bland's poem it lies with the playboy-turned-king who, "with two broken legs", inherits his own "golden wheelchair". Taking the place of his forebears, he can only preside over the "noise and dust" of the rest of us, who walk freely beneath him.

Up There

Forty storeys high, above the noise and dust,
twilight ripens: penthouse windows flash
their splendid isolations through the dusk.
Like Draculas the old tycoons wake up
as hushed lifts bring them nude Miss Worlds.

Between the stars small helicopters dash
with polar martinis, Rembrandts, fresh
silk shirts. In gold wheelchairs
these pale recluses salve their secret hurts.
Their visitors are others like themselves –

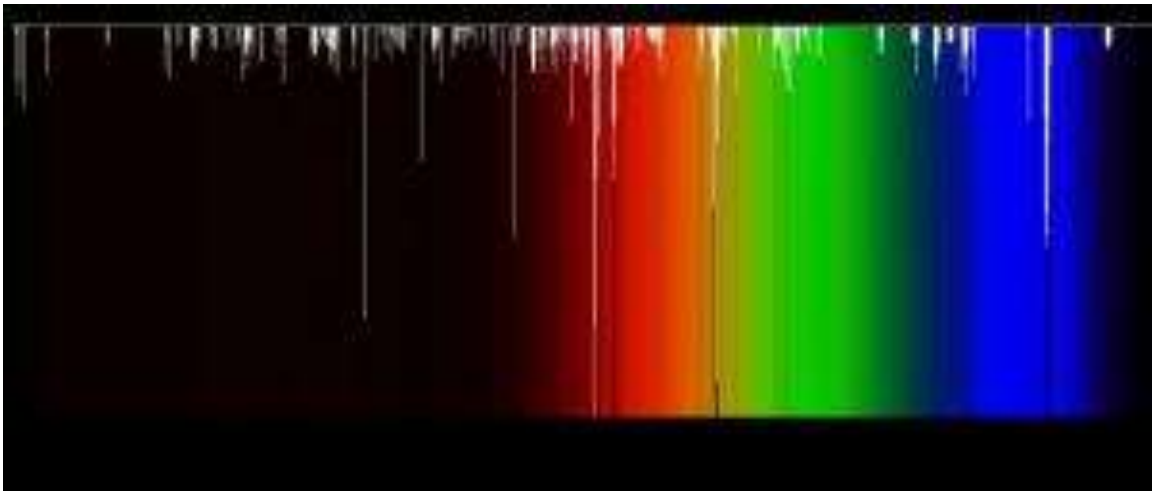
mad millionaires who bathe in milk,
who scrawl fat cheques on human flesh
and sleep in their spats on starched black sheets.
Dying, these ancients vanish like Viking Chiefs:
their private jets burn out across lost lakes.

Then, towers tremble. Down basement steps
they drag some playboy with two broken legs
(he'll swear it happened at St Moritz). Weeping
he waves to the press; his lift ascends;
the golden wheelchairs claim another King.

PETER BLAND (1978)

http://www.the-tls.co.uk/tls/public/article811939.ece

Carbon-Based Organic 'Carriers' in Interstellar Dust Clouds? Newly Discovered Diffuse Interstellar Bands



DIBs found in an earlier survey by P. Jenniskens and F.-X. Desert. The discovery of 13 diffuse interstellar bands with the longest wavelengths to date could someday solve a 90-year-old mystery. (Credit: NASA/P. Jenniskens and F.-X. Desert)

ScienceDaily (Nov. 2, 2011) — The discovery of 13 diffuse interstellar bands with the longest wavelengths to date could someday solve a 90-year-old mystery. Astronomers have identified the new bands using data collected by the Gemini North telescope of stars in the center of the Milky Way.

Nature now reports on its website findings that support recent ideas about the presence of large, possibly carbon-based organic molecules -- "carriers" -- hidden in interstellar dust clouds. The paper will also appear in the Nov. 10 print issue of the journal.

"These diffuse interstellar bands -- or DIBs -- have never been seen before," says Donald Figer, director of the Center for Detectors at Rochester Institute of Technology and a co-author of the study. "Spectra of stars have absorption lines because gas and dust along the line of sight to the stars absorb some of the light."

"The most recent ideas are that diffuse interstellar bands are relatively simple carbon bearing molecules, similar to amino acids," he continues. "Maybe these are amino acid chains in space, which supports the theory that the seeds of life originated in space and rained down on planets."

"Observations in different Galactic sight lines indicate that the material responsible for these DIBs 'survives' under different physical conditions of temperature and density," adds Paco Najarro, scientist in the Department of Astrophysics in the Center of Astrobiology in Madrid.

The low-energy absorption lines Figer and his colleagues discovered provide constraints for determining the nature of diffuse interstellar bands. Future theoretical models that predict wavelengths absorbed by these mysterious particles now must accommodate these lower energies, Figer notes.

"We saw the same absorption lines in the spectra of every star," Figer says. "If we look at the exact wavelength of the features, we can figure out the kind of gas and dust between us and the stars that is absorbing the light."

Diffuse interstellar bands have remained a puzzle since their initial discovery 90 years ago. The 500 bands identified before this study mostly occur at visible and near-infrared wavelengths. The observed lines do not match predicted lines of simple molecules and cannot be pinned to a single carrier.

"None of the diffuse interstellar bands has been convincingly identified with a specific element or molecule, and indeed their identification, individually and collectively, is one of the greatest challenges in astronomical spectroscopy," says lead author Thomas Geballe, from the Gemini Observatory. "Recent studies have suggested that DIB carriers are large carbon-containing molecules."

The newly discovered infrared bands can be used as probes of the diffuse interstellar medium, especially in regions in which thick dust and gas obscure observations in the optical and shorter wavelength bands.

Studying the stronger emissions in the group may lead to an understanding of their molecular origin. Some day laboratory spectroscopy could be used to identify the infrared diffuse interstellar bands. No one has been successful yet at reproducing the interstellar bands in laboratory, Figer notes, due to the multitude of possibilities and the difficulty of reproducing the temperatures and pressures the gas would experience in space.

In addition to Geballe, Najarro and Figer, co-authors of the paper included Najarro's student Diego de la Fuente and former Gemini science intern Barrett Schlegelmilch.

Story Source:

The above story is reprinted from materials provided by **Rochester Institute of Technology**. The original article was written by Susan Gawlowicz.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. T. R. Geballe, F. Najarro, D. F. Figer, B. W. Schlegelmilch, D. de la Fuente. **Infrared diffuse interstellar bands in the Galactic Centre region**. *Nature*, 2011; DOI: 10.1038/nature10527

http://www.sciencedaily.com/releases/2011/11/111102161149.htm

1934

Joseph Muddiman

We look back to a review of the Trial of Guy Fawkes and Others, edited by Donald Carswell

Published: 27 October 2011

This article first appeared in the TLS of November 8, 1934.

Old historical myths die slowly; and there are writers who still try to maintain the ancient tale about "Gunpowder Treason and Plot." The story that the British Solomon, James I, suddenly confronted with a letter warning one of his Catholic courtiers, Lord Monteagle, to absent himself from the meeting of Parliament upon Tuesday, 5th November, 1605, because a "terrible blow" would take place, instantly divined out of his own wisdom that the Houses would be blown up has been discarded: and the tale has to be retold nowadays.

There was a plot: but it was in its way as crazy as that invented in the next generation by Oates and Tonge, the only difference between the two plots being that, whereas Oates's tale was mere fiction from end to end, the plot actually unearthed by Robert Cecil, first Earl of Salisbury, was a real one. The main point in dispute nowadays is how far Cecil himself was the inventor of the plot. For this "man without a friend", James I's "pigmy", "wry-necked, crooked-backed and splay-footed", had at his beck and call "a secret service worthy of Tiberius". It is worth recalling that "Gunpowder Plot" seems to some extent to have been discredited in the next generation . Roger Palmer, Earl of Castlemaine, in his eloquent "Catholique Apology", published after the Great Fire of London, writes of it with contempt, comparing Cecil's spies to those of Cromwell; and the furious replies elicited by his tract seem to have escaped the attention of modern writers; but, nevertheless, the Pope-burning processions of Oates's day did not commemorate "Gunpowder plot". For they took place upon the anniversary of Queen Elizabeth's accession, November 17, and songs were sung in honour of "Queen Bess".

The last controversy about the Plot took place in 1897, when Father John Gerard, S. J., published his "What Was Gunpowder Plot", and was answered by S. R. Gardiner in "What Gunpowder Plot Was". But the end of controversy is not yet. More light will undoubtedly be provided in future volumes of the Calendars of the Hatfield Manuscripts, fifteen volumes of which have already been issued. The last of them (published in 1930) brings us down to the year 1603. But these manuscripts are so voluminous that Mr Carswell's "Introduction", commenting upon the evidence, is of greater value than the astonishing contemporary pamphlets taken (unfortunately) from Howell's misleading reprints in "State Trials"; but the latter add an element of solemn farce to the many sarcastic comments in Mr Carswell's all too brief introduction. Mr Carswell points out that of the thirteen original conspirators four, Catesby, Percy and the two Wrights, were slain by the sheriff of Worcestershire, Sir Richard Walsh, under highly suspicious circumstances. Another, the very important witness Tresham, conveniently died just before the trial. The remaining eight were tortured into making contradictory confessions that have never been printed in full, so that much of the existing evidence is unknown. The one alleged conspirator who was neither racked nor otherwise tortured was the Jesuit provincial, Father Henry Garnet, tricked, trapped and finally executed (some months after the original conspirators) by being simply hanged, without the accompanying barbarities of the times. His trial was a palpable "frame up".

A good many minor points remain to be cleared up. For instance, how much gunpowder had been stored under the House of Lords? There were thirty-two "barrels". Were these barrels small kegs only, and what did their contents weigh? And the authorship of the celebrated Monteagle letter (of which Mr Carswell prints a facsimile) is still a mystery. Mr Carswell devoted so much space to the trapping of Father Garnet and is, on the whole, so fair in his comments about Garnet's case that we regret to be compelled to call attention to the fact that, as he asserts of Father Gerard, "his zeal sometimes gets the better of his historical discretion: he wants to prove too much". "Unshakeable Protestantism" is all very well, but it should not lend itself to vilifying a martyr who died for his Faith; nor should it asperse the character of a good woman. Anne Vaux, who suffered much for helping Father Garnet.

http://www.the-tls.co.uk/tls/public/article807512.ece

Bigger Birds in Central California, Courtesy of Global Climate Change, Study Suggests

Birds are getting bigger in central California, and that was a big surprise for Rae Goodman and her colleagues. (Credit: © Celso Diniz / Fotolia)

ScienceDaily (Oct. 31, 2011) — Birds are getting bigger in central California, and that was a big surprise for Rae Goodman and her colleagues. Goodman uncovered the trend while working as a graduate student for Associate Professor of Biology Gretchen LeBuhn, analyzing data from thousands of birds caught and released each year at two sites near San Francisco Bay and Point Reyes National Seashore.

The SF State scientists found that birds' wings have grown longer and birds are increasing in mass over the last 27 to 40 years.

What's making the birds bigger? The researchers think that the trend is due to climate change, but their findings put a twist in the usual thinking about climate change and body size. A well-known ecological rule, called Bergmann's Rule, states that animals tend to be larger at higher latitudes. One reason for this rule might be that larger animals conserve body heat better, allowing them to thrive in the generally colder climate of higher latitudes.

Under this reasoning, some scientists have predicted that animals would get smaller as Earth has warmed up over the past 100 years. But the study, published in the journal *Global Change Biology*, suggests that the connection may not be so simple.

Climate change may affect body size in a variety of ways, they note in their paper. For instance, birds might get bigger as they store more fat to ride out severe weather events, which are expected to be more common under global climate change. Climate change could also alter a region's plant growth, which may eventually lead to changes in a bird's diet that affect its size.

LeBuhn said she was "completely surprised" to find that the central California birds were growing larger over time. "It's one of those moments where you ask, 'what's happening here?'" The results were so unexpected, she said, that the findings made them take a step back and look more closely at how climate change could influence body size.

The bird data come from two long-term "banding stations" in central California, where a wide variety of birds are captured, banded about the leg with an identification tag, and weighed and measured before being released. Many of the same birds were captured each year, allowing the researchers at the sites to build up a unique database that could be used to track changes among the birds over several decades.

The researchers used data from 14,735 individual birds collected from 1971 to 2010 at the Palomarin Field Station, near the southern end of the Point Reyes National Seashore, by researchers from PRBO Conservation Science. Their study also included data on 18,052 birds collected between 1983 and 2009, from the Coyote Creek Field Station at the southern end of the San Francisco Bay by the San Francisco Bay Bird Observatory.

"At the time I started my research, a few studies had looked at body size changes in a few species in Europe and the Middle East, but no one had examined bird body size changes in North America," said Goodman, who graduated from SF State in 2010 and now teaches biology and environmental science at San Francisco's Jewish Community High School of the Bay.

"We had the good fortune to find an unexpected result -- a gem in research science," she added. "But we were then left with the puzzle of figuring out what was going on."

After testing and discarding a number of other explanations, Goodman and her colleagues were confident that climate change was behind the longer wings and bigger bodies in most of the birds. The birds may be responding to climate-related changes in plant growth or increased climate variability in central California, the researchers suggest in the paper.

The findings offer a glimpse at the potent effects of climate change across a wide range of species, LeBuhn said. "Even over a pretty short period of time, we've documented changes in important traits like body size, where we don't expect to see much flexibility."

"But in some ways," she added, "it gave me a little more hope that these birds are able to respond -- hopefully in time -- to changes in climate."

Story Source:

The above story is reprinted from materials provided by **San Francisco State University**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Rae E. Goodman, Gretchen Lebuhn, Nathaniel E. Seavy, Thomas Gardali, Jill D. Bluso-Demers. **Avian body size changes and climate change: warming or increasing variability?** *Global Change Biology*, 2011; DOI: 10.1111/j.1365-2486.2011.02538.x

http://www.sciencedaily.com/releases/2011/10/111031154127.htm

Crumb Covers: The Album Art of R. Crumb

Posted: 03 Nov 2011 11:51 AM PDT

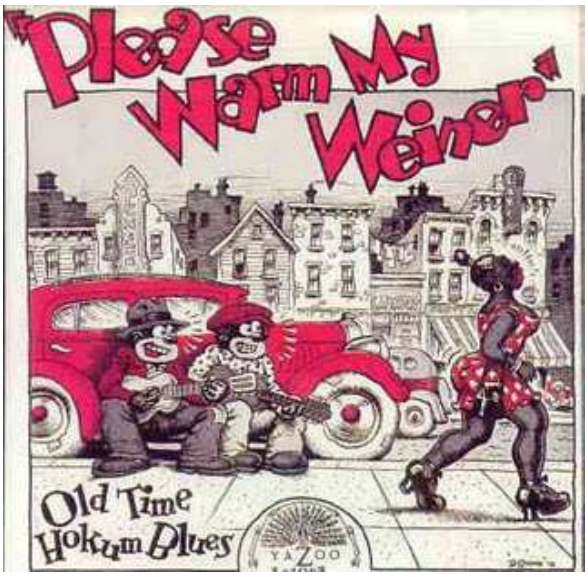
It was the late 1960's. Robert Crumb was an aspiring artist living in the Haight Ashbury neighborhood of San Fransisco when he was asked by Janis Joplin to design the cover for *Cheap Thrills*, the first major studio album of her band Big Brother And The Holding Company. The album would eventually reach number 1 on the Billboard charts exposing the world to the counterculture visuals of R. Crumb.

And so began the album cover career of R. Crumb.

Now, some 40+ years later, W.W. Norton has released a monograph featuring all of R. Crumb's record cover art.

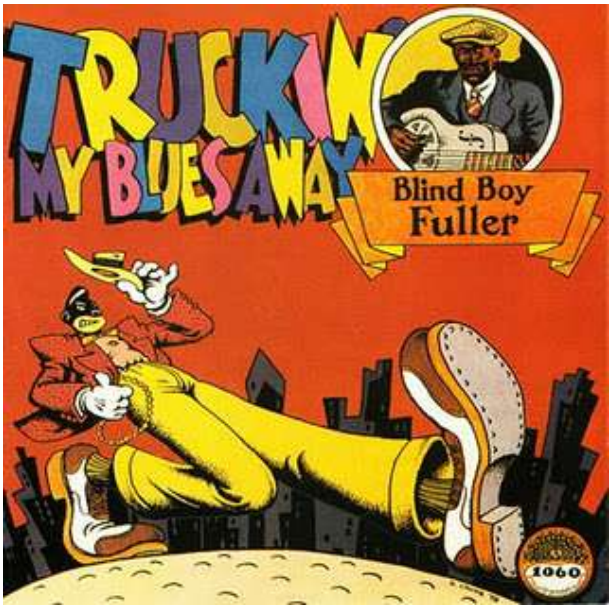
From his work for Joplin to his long standing commitment to jazz, country, and old-time blues music of the 1920s and 1930s to his CD art work for the Eden & John's East River String Band; Crumb's stamp is unmistakeable.

In addition to the covers this compilation presents additional work related to the covers and other lesser-known illustrations that in some way relate to the music.



The details:

Crumb, R. The Complete Record Cover Collection. New York: W.W. Norton & Company, 2011. . First Printing. Square quarto. [96]pp. More than two hundred fifty illustrations. Glossy pictorial boards, a Fine copy, as New in the publisher's slipcase. $27.95 Book is available here



http://feedproxy.google.com/~r/BookPatrol/~3/p4zhpmp3lm0/crumb-covers-album-art-of-r-crumb.html?utm_source=feedburner&utm_medium=email

Hippocampus Plays Bigger Memory Role Than Previously Thought

Researchers report a new methodology that more deeply parses how and where certain types of memories are processed in the brain, and challenges earlier assumptions about the role of the hippocampus. (Credit: iStockphoto/Guido Vrola)

ScienceDaily (Nov. 1, 2011) — Human memory has historically defied precise scientific description, its biological functions broadly but imperfectly defined in psychological terms. In a pair of papers published in the Nov. 2 issue of *The Journal of Neuroscience*, researchers at the University of California, San Diego report a new methodology that more deeply parses how and where certain types of memories are processed in the brain, and challenges earlier assumptions about the role of the hippocampus.

Specifically, Larry R. Squire, PhD, a Research Career scientist at the VA Medical Center, San Diego and professor of psychiatry, neurosciences, and psychology at UC San Diego, and Christine N. Smith, PhD, a project scientist, say that contrary to current thinking the hippocampus (a small seahorse-shaped structure located deep in the center of the brain and long associated with memory function) supports both recollection and familiarity memories when these memories are strong.

Recollection and familiarity memory are two components of recognition memory -- the ability to identify an item as having been previously encountered. Recollection memory involves remembering specific details about a learning episode, such as where and when the episode occurred. Familiarity memory refers to remembering an item as previously encountered, but without any recall of specific details, such as recognizing someone's face but recalling nothing else about that person (For example, where you met the person.).

Prevailing research posits that recollection and familiarity memories involve different regions in the brain's medial temporal lobe: the hippocampus for recollection, the adjacent perirhinal cortex for familiarity.

"But given the connectivity in that part of the human brain, that separation seemed too clean, too neat," said Squire, a leading expert on the neurological bases of memory. "The idea of distinct functions was unlikely."

Recollection-based memories are typically associated with higher confidence and accuracy than familiarity-based decisions. Accordingly, in the past, comparisons between recollection and familiarity have also involved a comparison between strong memories and weak memories. So the question is how the brain accomplishes recollection and familiarity when the effect of memory strength is taken off the table.

Squire, Smith and John T. Wixted, PhD, professor of psychology and chair of the UC San Diego Department of Psychology, developed a novel method for assessing not just how recollection and familiarity memories are formed, but also their strength. The scientists combined functional magnetic resonance imaging of the brain with a test in which study participants looked at a series of words and judged on a 20-point confidence scale if each word had been studied earlier or not. If the word was deemed old (the upper half of the scale), participants were asked to decide if it was "remembered," which denotes recollection, "known," which denotes familiarity, or simply "guessed."

Not surprisingly, recollected items had a higher accuracy and confidence rating among participants than did familiar items. Previous studies have produced similar results. But when the UC San Diego scientists compared recollected and familiar items that were both *strongly* remembered, the data showed that the hippocampus was actively involved in both, contrary to earlier research.

The discovery peels away another layer of complexity in human memory, said Squire. "If we really want to know how the brain works, the best guide is to think of it in terms of neuroanatomy. Psychological descriptions got us started, but a fundamental map and understanding will require a deeper biological foundation."

In practical terms, Squire said, the findings may help in diagnosing and treating patients with memory problems. "If you have better constructs, you have a better way of knowing what's going on in a patient's brain. You can be more precise in your thinking about what's happening and what to do."

First-author Smith said their research may prompt other scientists to re-think some of their studies. "This was the first study to re-do earlier research with these controls. We hope it will encourage others to reassess the potential effect of strength of memory in studies of this kind."

In the second paper, Squire, with co-authors Zhuang Song, PhD, a postdoctoral researcher, and Annette Jeneson, a graduate student, used a novel combination of neuroimaging with other tests to also show that the hippocampus is related to encoding of familiarity-based item memories, not just recollection-based memories.

Funding for this research came, in part, from the Medical Research Service of the Department of Veterans Affairs, the National Institute of Mental Health and the Metropolitan Life Foundation.

Story Source:

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http://www.sciencedaily.com/releases/2011/11/111101173636.htm

Reform, not revolution

Where did the left go?
As capitalism faces the worst economic crisis since the1930s, the parties of the left are silent or embarrassed. At best, they promise to put the system right. More often, they advocate brutal austerity to prove their seriousness
by Serge Halimi

The Occupy Wall Street protests in the US are also directed against the Street's representatives in the Democratic Party and the White House. The protesters probably don't know that Socialists in France still consider Barack Obama exemplary, since, unlike President Sarkozy, he had the foresight to take action against banks. Is there a misunderstanding? Those who are unwilling or unable to attack the pillars of the neoliberal order (financialisation, globalisation of movements of capital and goods) are tempted to personalise the disaster, to attribute the crisis in capitalism to poor planning or mismanagement by their political opponents. In France it's Sarkozy, in Italy Berlusconi, in Germany Merkel, who are to blame. And elsewhere?

Elsewhere, and not only in the US, political leaders long considered as models by the moderate left also face angry crowds. In Greece, the president of the Socialist International, George Papandreou, is pursuing a policy of extreme austerity: privatisations, cuts in the civil service, and delivering economic and social sovereignty to a ultra-neoliberal "troika" (1). The conduct of the Spanish, Portuguese and Slovenian governments reminds us that the term "left" is now so debased that it is no longer associated with any specific political content.

The current French Socialist Party spokesman explains the impossible situation of European social democracy very clearly: in his new book *Tourner la page*, Benoît Hamon writes: "In the European Union, the European Socialist Party is historically associated, through the compromise linking it with Christian democracy, with the strategy of liberalising the internal market and the implications for social rights and public services. Socialist governments negotiated the austerity measures that the European Union and the International Monetary Fund wanted. In Spain, Portugal and Greece, opposition to the austerity measures is naturally directed against the IMF and the European Commission, but also against the socialist governments … Part of the European left no longer denies that it is necessary, like the European right, to sacrifice the welfare state in order to balance the budget and please the markets. … We have blocked the march of progress in several parts of the world. I cannot resign myself to this" (2).

Others think the debasement is irreversible because it is connected to the gentrification of European socialists and their lack of contact with the world of work.

The Brazilian Labour Party (PT), a generally moderate party, thinks the Latin American left should take over from the Old World left, which is too capitalist, too Atlanticist, and unconvincing in its claims to defend the interests of the people: "The ideological leadership of the left is moving to a new part of the world," according to a document for the PT Congress in September. "South America is the salient example [see *Latin America's Pink Tide*]. … The left in European countries, which has had such an influence on the left worldwide since the 19th century, has not managed to produce an adequate response to the crisis and appears to be capitulating to the forces of neoliberalism" (3). The decline of Europe may also signal the end of the ideological influence of the continent where trade unionism, socialism and communism were born. Europe now appears more resigned than others to their demise.

A ritual performance

Is it all over? Can voters and leftwing militants concerned with the content rather than the label hope to fight the right (in western countries, too) when the parties they vote for have converted to neoliberalism but still have the power to win elections? It has become a ritual performance: the distinction between reforming left and conservative is maintained during the election campaign by an optical illusion. Then, given the chance, the left runs the country just like its opponents, taking care not to upset the economic order.

Most leftwing candidates with their eye on a post in government insist that social change is needed, even urgently needed. But to bring about such change, they must see more in it than election hype and they must win the election. And it is on this precise point that the moderate left lectures the "radicals" and other "protesters". It is not waiting for a "great debate" (see *The US left's great debate,* page 12) or dreaming of an alternative society far removed from the world, inhabited by exceptional people. To quote the French Socialist leader François Hollande, it does not intend to "thwart rather than try. Hold back rather than act. Resist rather than conquer". It believes that "not beating the right means keeping it alive, and that means choosing it" (4). The radical left would prefer, in Hollande's words, "to exploit any anger for all it is worth" rather than "opt for realism" (5).

The left in government has a trump card: it has the voters behind it here and now and it has an eager and professional team ready to take over. But victory over the right is no substitute for a plan. Once the elections are won, the structures already in place national, European, or international are likely to constrain the desire for change expressed during the election campaign. In the US, Obama could claim that industrial lobbies and blocking moves by the Republicans in Congress had sapped the government's proactive ("Yes, we can") spirit despite wide popular support.

Elsewhere leftwing governments explained their caution or their cowardice with talk of constraints and inherited problems (an internationally uncompetitive production sector, a high level of debt) that left little room for manoeuvre. As Lionel Jospin said in 1992: "Our public life is dominated by a strange dichotomy. On the one hand, the [Socialist] government is blamed for unemployment, troubles in the suburbs, social unrest, extremism on the right, and despair on the left. On the other hand, it is urged not to abandon a financial economic policy that makes it very difficult to deal with these problems" (6).

His words are fresh and pertinent today. Socialists remember them every time they argue in favour of tactical voting: should the left lose the next election, the victorious right would immediately unleash neoliberal reforms privatisations, curbs on trade union rights, public spending cuts that would destroy the tools that might shape a different policy. Hence the tactical vote for the moderate left. Yet there may be lessons to be learned from defeat. Benoît Hamon admits that in Germany "the result of the [September 2009] parliamentary elections, in which the SPD share of the vote [23%] was the lowest in a hundred years, convinced the leadership that a change of direction was needed" (7).

Equally modest policy reviews were conducted in France after the Socialist defeat in 1993, and in the UK after the (partial) Conservative victory in 2010. The same process will probably be repeated in Spain and Greece soon, since their socialist governments are unlikely to attribute their forthcoming defeats to revolutionary policies. Defending Papandreou, the Greek Socialist MP Elena Panaritis cited an unexpected example: "It took Margaret Thatcher 11 years to complete her reforms in a country where the structural problems were not so serious. Our programme has only been running for 14 months" (8). Or, Papandreou does it better than Thatcher.

Escaping from this vicious circle means listing the conditions needed to bring financial globalisation into line. There is an immediate problem: given the plethora of sophisticated mechanisms that have linked national economic development with capitalist speculation for the past 30 years, even a relatively soft reform policy

(adjusting unfair taxes, increasing purchasing power, maintaining the education budget) now requires significant breaks with the past with both the current European order and earlier socialist policies.

We shall be off to a bad start unless we review the "independence" of the European Central Bank (assured under the European treaties that its monetary policy will not be subject to democratic control); unless we introduce flexibility into the stability and growth pact (which, in a crisis, stifles any proactive strategy for dealing with unemployment); unless we condemn the Liberal-Social Democrat alliance in the European parliament (which led the Social Democrats to support Mario Draghi, former vice chairman and managing director of Goldman Sachs, as a candidate for the post of president of the ECB), and challenge free trade (the European Commission's preferred policy), and the public debt audit (to avoid reimbursing speculators who betted against the weakest countries in the eurozone) (9).

The game may even be lost before it begins. There is no reason to believe that François Hollande in France, Sigmar Gabriel in Germany or Ed Miliband in the UK will succeed where Obama, Jos Luis Zapatero and Papandreou have failed. To imagine, as Massimo d'Alema hopes, that "an alliance that places the political union of Europe at the heart of its policy will revive the progressive movement" (10) is a dream. In the current political and social situation, a federal Europe would strengthen the already stifling neoliberal mechanisms and reduce the sovereign power of the people by handing it over to shadowy technocratic bodies. Currency and trade have already been federalised.

However, as long as the moderate left parties continue to represent most progressive voters either because they support those parties' policies or because they believe those policies offer the only prospect of change in the near future more radical political bodies will be relegated to bit parts or sent backstage. Even with 15% of the vote, 44 MPs, four ministers and an organisation that included tens of thousands of militants, the French Communist Party (PCF) never influenced François Mitterrand's political, economic and financial policies between 1981 and 1984. The Communist Refoundation Party in Italy, trapped in an alliance with the centre-left parties, has failed and does not inspire; their aim was to prevent, at any cost, Silvio Berlusconi getting in again but he got in again anyway, later.

Last sparks from a dead star

In France, the Left Front (which includes the PCF) hopes to beat the trend. By exerting pressure on the PS, it hopes to help it escape the tyranny of the past. This may seem deluded, even desperate. But, while there is more to it than relative voting strength and institutional constraints, there are some historical precedents. None of the Popular Front's great social achievements (paid holidays, the 40-hour week) were included in the very modest programme of the coalition that won in April-May 1936; it was the strikesof June that forced the French employers to accept them.

However, that is not just a history of the irresistible force of a social movement and the pressure it put on scared or timid leftwing parties. It was the Popular Front's victory in the elections that began the social revolt by giving workers the feeling that they would no longer be repressed by police and employers, as they had been. They took heart, but they also knew that the parties they had voted for would give them nothing unless arms were twisted. Hence the winning but rare dialectic between election and mobilisation, voting booths and factory floors. As things now stand, a leftwing government spared from this pressure would immediately enter into a solid marriage with the technocrats, who only know neoliberalism. Their obsession would be to win over the rating agencies, which will immediately downgrade any country that pursues a genuine leftwing policy.

So, strike out boldly or toe the line and get stuck right away? The risks of striking out isolation, inflation, downgrading are dinned into us. But what about the risks of toeing the line? Reviewing Europe's situation in the 1930s, historian Karl Polanyi recalled that "the *impasse* reached by liberal capitalism" had led in some countries to "a reform of market economy achieved at the price of the extirpation of all democratic

institutions" (11). Even Michel Rocard, a most moderate socialist, is alarmed at that prospect: imposing harder conditions on the Greeks could mean the end of Greek democracy. "Given the anger that the people will feel," he wrote last month, "it is doubtful whether any Greek government can hold on without the support of the army. This sad observation probably applies equally to Portugal and/or Ireland, and/or other, larger, countries. How far will it go?" (12).

The republic of the centre has institutions and media behind it, but it is tottering. The race is on between tough neoliberal authoritarianism and a break with capitalism. These still seem a long way off. But when the people cease to believe in a political game in which the dice are loaded, when they see that governments are stripped of their sovereignty, when they demand that banks be brought into line, when they mobilise without knowing where their anger will lead then the left is still very much alive.

http://mondediplo.com/2011/11/01left

Urban 'Heat Island' Effect Is a Small Part of Global Warming; White Roofs Don't Reduce It, Researchers Find

A new study shows that the urban heat island effect is a relatively minor contributor to warming, contrary to what climate skeptics have claimed. (Credit: © olly / Fotolia)

ScienceDaily (Oct. 20, 2011) — Cities release more heat to the atmosphere than the rural vegetated areas around them, but how much influence these urban "heat islands" have on global warming has been a matter of debate. Now a study by Stanford researchers has quantified the contribution of the heat islands for the first time, showing that it is modest compared with what greenhouse gases contribute to global warming.

"Between 2 and 4 percent of the gross global warming since the Industrial Revolution may be due to urban heat islands," said Mark Z. Jacobson, a professor of civil and environmental engineering who led the study. He and graduate student John Ten Hoeve compare this with the greenhouse gas contribution to gross warming of about 79 percent and the black carbon contribution of about 18 percent.

Black carbon is a component of the soot created by burning fossil fuels and biofuels and is highly efficient at absorbing sunlight, which heats the atmosphere.

Gross global warming is the total amount of warming that has taken place from all sources, mainly greenhouse gases, black carbon particles and heat islands. Net global warming is gross global warming minus the cooling effect of light-colored atmospheric particles that reflect sunlight back into space, which offsets about half of global warming to date. Net, or observed, global warming is what is typically reported in the media.

Responding to skeptics

Jacobson and Ten Hoeve are authors of a paper describing the research that will be published in *Journal of Climate*. The paper is available online now. The study modeled climate response from 2005 to 2025.

Some global warming skeptics have claimed that the urban heat island effect is so strong that it has been skewing temperature measurements that show that global warming is happening. They have argued that urban areas are a larger contributor to global warming than the greenhouse gases produced by human activity, and thus drastic measures to reduce greenhouse gases are not needed.

"This study shows that the urban heat island effect is a relatively minor contributor to warming, contrary to what climate skeptics have claimed," Jacobson said. "Greenhouse gases and particulate black carbon cause far more warming."

Prior to Jacobson's study, claims about the importance of heat island to global warming could not be addressed directly. The few previous modeling studies by other researchers that had examined the effect of urban heat islands on regional scales did not calculate global impacts.

Jacobson's high-resolution study was the first study of the impact of urban heat islands on global sea-surface temperatures, sea ice, atmospheric stability, aerosol concentrations, gas concentrations, clouds and precipitation. He characterized urban surfaces around the world at a resolution of one kilometer, making his simulation both extremely detailed and globally comprehensive.

"This study accounted not only for local impacts of the heat island effect, but also feedbacks of the effect to the global scale," he said.

Although his study showed that urban heat islands are not major contributors to global warming, Jacobson said reducing the effect of heat islands is still important for slowing the rise of global temperatures.

The urban heat island effect is caused mostly by replacing soil and vegetation with paved roads, sidewalks and buildings. Paving prevents evaporation of water from the soil and plant leaves. Since evaporation is a cooling process, reducing evaporation warms cities. Additionally, the darker colors of some roads and buildings absorb more sunlight, heating a city further.

One "geoengineering" proposal for reducing the impact of urban heat islands is to paint roofs worldwide a reflective white. Jacobson's computer modeling concluded that white roofs did indeed cool urban surfaces. However, they caused a net global warming, largely because they reduced cloudiness slightly by increasing the stability of the air, thereby reducing the vertical transport of moisture and energy to clouds. In Jacobson's modeling, the reduction in cloudiness allowed more sunlight to reach the surface.

The increased sunlight reflected back into the atmosphere by white roofs in turn increased absorption of light by dark pollutants such as black carbon, which further increased heating of the atmosphere.

Jacobson's study did not examine one potential benefit of white roofs -- a reduced demand for electricity to run air conditioning in hot weather. But a recent study done at the National Center for Atmospheric Research showed that the decrease in air conditioning use, which occurs mostly in the summer, might be more than offset by increases in heating during winter months.

"There does not seem to be a benefit from investing in white roofs," said Jacobson. "The most important thing is to reduce emissions of the pollutants that contribute to global warming."

Photovoltaic panels helpful

One way to reduce emissions while simultaneously reducing summer air conditioning demand is to install photovoltaic panels on roofs. Such panels not only generate electricity, reducing emissions of fossil fuels from electricity-producing power plants, but they also reduce sunlight absorbed by buildings because they convert sunlight to electricity. Because photovoltaic panels do not reflect the sunlight back to the air, unlike white roofs, reflected light is not available to be absorbed again by pollutants in the air, creating heat.

"Cooling your house with white roofs at the expense of warming the planet is not a very desirable trade-off," Jacobson said. "A warmer planet will melt the sea ice and glaciers faster, triggering feedbacks that will lead to even greater overall warming. There are more effective methods of reducing global warming."

Jacobson is the director of Stanford's Atmosphere/Energy Program and a senior fellow at Stanford's Woods Institute for the Environment and the Precourt Institute for Energy. Graduate student John Ten Hoeve

contributed to the research and is coauthor of the paper. Funding for the research was contributed by NASA and the U.S. Environmental Protection Agency.

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Economic crisis: fighting back
We need a third way, now

Globalisation has brought economic disaster, but anti-globalisation isn't the answer. There is an alternative by Jean-Marie Harribey

The financial sector has brought society almost to breaking point. The economic edifice is tottering, and the ideological veil that hid its true face has been torn away. The high priests of globalisation have ceased their hymn of praise to the efficiency of the markets, and a debate has arisen over its opposite: deglobalisation. This debate is unusual: it does not set believers in the current orthodoxy against non-believers, but divides the economists and politicians who objected to the tyranny of the financial markets, especially during the campaign against the ratification of the European constitutional treaty.

Over the past few months, newspapers, books and academic journals have brought the discussion of protectionism, leaving the euro and deglobalisation into the public arena (1). The arguments most commonly cited concern the nature of the crisis facing capitalism, the regulatory framework needed and the issue of democratic sovereignty.

Since the early 1980s, the structures of capitalism have been designed to maximise return on investment ("creating shareholder value") while systematically devaluing labour. The latter allows the former, since the free movement of capital makes it possible to bring the social and fiscal systems into competition. "Globalisation" stands for the redeployment of capital at a global level, to solve the profit margin crisis that emerged in the late 1960s and early 1970s, the supremacy of the dominant classes, whose financial interests take precedence over ordinary people's wages, and pressure on the regulatory authorities to conform to the demands of the markets.

It has taken just 20 years to bring down this edifice: in the mid-2000s profit margins in the US stopped rising and loans to the poor, to compensate for insufficient wages, were no longer enough to absorb US industrial over-production. The shockwaves spread as fast as capital was shifted.

Whole of life a commodity

The present global crisis is not the sum of the crises facing individual countries (Greece, Ireland, Portugal, Spain), which some believe are due solely to internal problems specific to each (strange that they should all manifest themselves at the same time). It is due mainly to capitalism having reached maturity on a global scale, and to the logic of shareholder value creation being taken to an extreme, with everything treated as a marketable commodity, from the production of basic goods and services to healthcare, education, culture and natural resources in short, the whole of life.

So globalisation cannot be reduced simply to free trade, the mere movement of goods. The law of value has caught up with finance, which now faces an unavoidable task: it must restore the value of work, which is not infinitely compressible, and it must do so on the strength of a material base that is deteriorating or becoming rarefied (2). The financial crisis is really due to capitalist overproduction and a model of development that has reached the end of the road.

One of the key arguments of leftwing advocates of deglobalisation is that globalisation is responsible for destroying employment and industry in rich countries. According to the economist Jacques Sapir, "Up to the mid-1990s, the advances in productivity in emerging economies were not big enough to change the balance of power with the dominant economies. But since the mid-1990s there have been very considerable advances in productivity in countries such as China and in eastern Europe. And whole sections of economic activity have been moving out of the industrialised countries" (3). So the inversion of the balance of power between the

dominant classes and salaried workers in industrialised countries predates the economic emergence of China by at least 15 years.

In France, the allocation of added value to salaries fell (by around five points gross among non-financial companies compared with 1973 and nearly 10 points compared with 1982) (4), and unemployment surged, during the 1980s. The levels reached during that decade (very low for the allocation to salaries and very high for unemployment) have never really changed since, except during the brief period 1997-2001. So it is right to say that competition between workforces, which has intensified over the past few years, has reinforced the position of the wealthy, but not to claim that the primary responsibility for the decline in employment in the developed capitalist economies lies with the emerging economies.

In rich countries, neoliberalism has led to a division of wealth between capital and labour that favours capital, and changed relative remuneration levels among workers (those on higher salaries have received very large increases, often because their remuneration includes stock options). This is as much to do with the social status enjoyed by senior executives because of their technical abilities, as with the social dumping suffered by workers at the bottom end of the wage scale.

Theorists should be careful to avoid turning a class conflict into a conflict between nations. Frédéric Lordon fears such prudence is futile since "the structures of economic globalisation have effectively brought [Chinese and French workers] into a mutually antagonistic relationship that no amount of denial can remedy" (5). Protectionist measures would give antagonism between nations more importance than class antagonism. In fact the systemic nature of the global capitalist crisis stems from the fundamental social relationship on which capitalism is founded and casts doubt on the ability of countries to extricate themselves from the crisis by means of national solutions.

With a few rare exceptions (such as Ecuador), governments have taken it upon themselves to make ordinary people foot the bill for the crisis, for the dominant classes in every country take the same attitude. No government wishes to risk, or is able to risk, facing the consequences of a default on sovereign debt that could spread once the first link in the chain is broken. Consequently, they have all condemned their economies to recession. But globalisation is not only a commercial and financial phenomenon; it also concerns production, with the result that the big multinationals show little concern for national economic trends. The question of where to regulate and fight the crisis is therefore crucial.

Regulation urgently needed

Should we condemn the idea of powerful international institutions as a foolish dream? Yes if it's a matter of rejecting talk of "global governance" as nonsense, or condemning the procrastination and failures of the G8, G20 and other assemblies of leaders of the dominant economies. But there is a problem: how to establish global regulation? Leftwing advocates of deglobalisation cite the example of the post-war period, characterised by the Keynesian approach to regulation inaugurated at Bretton Woods.

Two facts show how urgent it is to regulate without waiting for capitalism to be abolished or simply contained. The first relates to agriculture, which today is characterised by complete deregulation of trade in farm products; as a result the best farmland in the southern hemisphere is used to grow export crops to the detriment of subsistence crops, effective demand has fallen and global base prices are highly volatile. How can every country hope to achieve relative autonomy and food sovereignty if the agricultural markets are not ring-fenced, at a global level, to rescue agricultural products, and indeed all commodities, from speculation and the vagaries of the market?

The second fact relates to the struggle against climate change, which is of course a global problem. The failure of the post-Kyoto talks in Copenhagen in 2009 and Cancun in 2010 was mainly due to conflicts of interest between the most powerful economies, which are prisoners of their links to lobbies and

multinationals. The emergence of a public conscience calling for the safeguarding of humanity's common heritage, endowed with a global vision, could influence these negotiations. An example is the appeal made by the World People's Conference on Climate Change and the Rights of Mother Earth, on the initiative of the Bolivian government, in April 2010.

The agriculture and climate issues show the need for a complete overhaul of the development model on which capitalist globalisation is based. This aspect is sometimes ignored by advocates of deglobalisation, who cite as their main example the nationally based Fordian model, which is better regulated than the neoliberal model but has led to devastating productivism (the belief that measurable economic productivity and growth is the purpose of human organisation and that more production is necessarily good). We must define the sphere where democratic sovereignty can be exercised.

No obvious solution

How do advocates of deglobalisation see the problem? "Whatever one may think," writes Lordon, "the obvious solution is to reconstitute national sovereignty. It has the great practical advantage, over all other solutions, of already being in place, of being immediately available subject, obviously, to a certain amount of restructuring to make it economically viable: selective protectionism, the control of capital, the political supervision of banks, all things that are perfectly feasible provided one wants them" (6). These levels of restructuring are entirely pertinent. The problem is the suggestion that national sovereignty is the "obvious" solution, "immediately available" and "already in place", when a major consequence of globalisation has been to deprive democracy of all substance and hand over power to the financial markets.

The most difficult task facing nations is not simply reviving their sovereignty but completely rebuilding it. This must be done both at national and (in the case of Europe) at regional level, since the standoff with the capital markets is no longer exclusively, or even perhaps chiefly, at national level. Paradoxically, while democracy is still mostly expressed at national level, the regulations and restructuring that are needed, especially in the environmental field, must take place at a supra-national level; hence the importance of gradually building a European democratic space. Since the global crisis is not merely the sum of national crises, there can be no national solution.

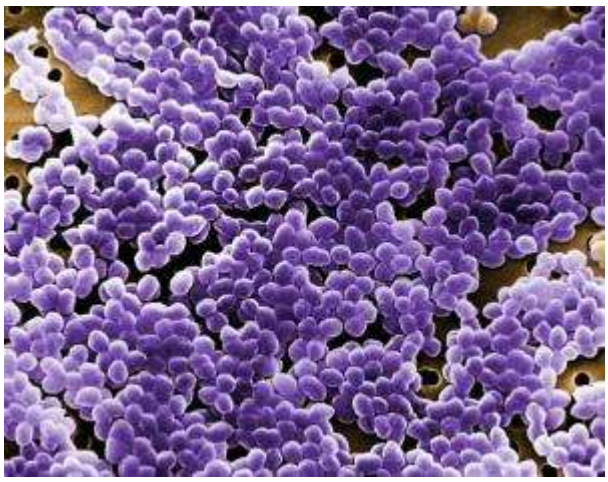
The question remains where to begin the task of dismantling neoliberal capitalism. In the short term, it is a matter of urgency to declare most public debts illegitimate and to announce that they will not be honoured, prioritising countries at a European level according to the severity of their problems. The order of priority must be based on an audit of public debts. The entire European banking sector must be collectivised. And strongly progressive taxation must be restored. None of this is impossible in practical terms; all that is missing is the political will, in the words of Keynes, to "euthanise the rentier" by abolishing unearned income.

In the medium-to-long term, there must be a radical transformation of the development model in a non-capitalist direction. The dismantling of the current structures of finance is the first step; it could be launched with a ban on over-the-counter transactions and on derivatives, and the taxation of all other financial transactions. There must also be strict delineation of the area in which the pursuit of profit is permissible if non-trade activities and public interest activities are to be developed while maintaining an ecological balance.

What should we call this approach? The protective measures that will be necessary (the right to work, social security, environmental measures) do not necessarily constitute protectionism. Selective deglobalisation or, on the contrary, globalisation, will no doubt be trickier in practice, but will have the advantage of identifying the real targets to be reached, outlining a socio-ecological bifurcation of societies and gradually building real international cooperation. This is alter-globalisation, which, while criticising every aspect of globalisation, does not advocate its apparent opposite.

http://mondediplo.com/2011/11/05globalisation

Bacteria May Readily Swap Beneficial Genes: Microbes Trade Genetic Coding for Antibiotic Resistance and More



Colony of gram-positive Enterococcus sp. bacteria. (Credit: CDC, Janice Haney Carr)

ScienceDaily (Nov. 1, 2011) — Much as people can exchange information instantaneously in the digital age, bacteria associated with humans and their livestock appear to freely and rapidly exchange genetic material related to human disease and antibiotic resistance through a mechanism called horizontal gene transfer (HGT).

In a paper appearing in *Nature* online Oct. 30, researchers -- led by Eric Alm of MIT's Department of Civil and Environmental Engineering and Department of Biological Engineering -- say they've found evidence of a massive network of recent gene exchange connecting bacteria from around the world: 10,000 unique genes flowing via HGT among 2,235 bacterial genomes.

HGT is an ancient method for bacteria from different lineages to acquire and share useful genetic information they didn't inherit from their parents. Scientists have long known about HGT and known that when a transferred gene confers a desirable trait, such as antibiotic resistance or pathogenicity, that gene may undergo positive selection and be passed on to a bacterium's own progeny, sometimes to the detriment of humans. (For example, the proliferation of antibiotic-resistant strains of bacteria is a very real threat, as seen in the rise of so-called "superbugs.")

But until now, scientists didn't know just how much of this information was being exchanged, or how rapidly. The MIT team's work illustrates the vast scale and rapid speed with which genes can proliferate across bacterial lineages.

"We are finding [completely] identical genes in bacteria that are as divergent from each other as a human is to a yeast," says Alm, the Karl Van Tassel Associate Professor. "This shows that the transfer is recent; the gene hasn't had time to mutate."

"We were surprised to find that 60 percent of transfers among human-associated bacteria include a gene for antibiotic resistance," adds computational systems biology graduate student Chris Smillie, one of the lead authors of the paper.

These resistance genes might be linked to the use of antibiotics in industrial agriculture: The researchers found 42 antibiotic-resistance genes that were shared between livestock-associated and human-associated

bacteria, demonstrating a crucial link connecting pools of drug resistance in human and agricultural populations.

"Somehow, even though a billion years of genome evolution separate a bacterium living on a cow and a bacterium living on a human, both are accessing the same gene library," Alm says. "It's powerful circumstantial evidence that genes are being transferred between food animals and humans."

Moreover, the team identified 43 independent cases of antibiotic-resistance genes crossing between nations. "This is a real international problem," says microbiology graduate student Mark Smith, another lead author of the study. "Once a trait enters the human-associated gene pool, it spreads quickly without regard for national borders."

The practice of adding prophylactic antibiotics to animal feed to promote growth and prevent the spread of disease in densely housed herds and flocks is widespread in the United States, but has been banned in many European countries. According to the Federal Drug Administration, more than 80 percent of the 33 million pounds of antibiotics sold in the United States in 2009 was for agricultural use, and 90 percent of that was administered subtherapeutically through food and water. This includes antibiotics such as penicillins and tetracyclines commonly used to treat human illness.

The MIT researchers found that HGT occurs more frequently among bacteria that occupy the same body site, share the same oxygen tolerance or have the same pathogenicity, leading them to conclude that ecology -- or environmental niche -- is more important than either lineage or geographical proximity in determining if a transferred gene will be incorporated into a bacterium's DNA and passed on to its descendants.

"This gives us a rulebook for understanding the forces that govern gene exchange," Alm says.

The team applied these rules to find genes associated with the ability to cause meningitis and other diseases, with the hope that transferred traits and the genes encoding those traits might make especially promising targets for future drug therapies.

"This is a very interesting piece of work that really shows how the increasing databases of complete genome sequences, together with detailed environmental information, can be used to discover large-scale evolutionary patterns," says Rob Knight, associate professor of chemistry and biochemistry at the University of Colorado at Boulder, who says he agrees with the authors' findings. "The availability of vast datasets with excellent environmental characterization will give us an unprecedented view of microbes across the planet."

Continuing the work, the researchers are now comparing rates of exchange among bacteria living in separate sites on the same person and among bacteria living on or in people with the same disease. They're also studying an environmentally contaminated site to see which swapped genes might facilitate microbial cleanup by metal-reducing bacteria.

Other co-authors of the Nature paper are graduate student Jonathan Friedman, postdoc Otto Cordero and former graduate student Lawrence David, now at Harvard University.

The work is part of the National Institutes of Health's Human Microbiome Project. It was funded by the Department of Energy's ENIGMA Scientific Focus Area and the National Science Foundation.

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Coalition of the disenchanted

Occupy Wall Street is rapidly spreading in the US, London and elsewhere, as protestors vent their anger at corporate greed. But is the movement against capitalism as such?
by Jeff Goodwin

The global capitalist crisis prompted protests and rebellions in different countries, poor and rich. In the US, budget cuts and attacks on the collective bargaining rights of state employees led to action earlier this year notably in Wisconsin, where hundreds of thousands took to the streets and occupied the state capital building.

But Occupy Wall Street (OWS) is possibly a more radical social movement. Started in early September with the occupation of a small park in Manhattan's financial district, it has spread to hundreds of cities and towns across the US. Unlike the Wisconsin protests, OWS is not a response to a particular bill, budget or specific government threat: instead, it expresses a broad indictment of corporate power, economic and political.

The "Declaration of the Occupation of New York City" drawn up by OWS activists sums up their perspective: "We write so that all people who feel wronged by the corporate forces of the world can know that we are your allies. As one people, united, we acknowledge the reality: that the future of the human race requires the cooperation of its members; that a democratic government derives its just power from the people, but corporations do not seek consent to extract wealth from the people and the Earth; and that no true democracy is attainable when the process is determined by economic power. We come to you at a time when corporations, which place profit overpeople, self-interest over justice, and oppression over equality, run our governments."

Though the movement has targeted the banks and financial institutions we associate with Wall Street, it views corporate power more generally as the source of the problems of the 99% of the population the movement claims to represent. In a country where capitalism has only been weakly and intermittently challenged, this is clearly not US politics as usual.

OWS activists in New York are not exactly Marxists. They tend to decry "corporate greed" rather than capitalism as such. In this respect, OWS resembles the *indignados* (the indignant) who are protesting in Madrid, Athens, London and elsewhere. The tactic of permanently occupying public space was clearly influenced by the occupation of Tahrir Square in Cairo this January. This is not simply a movement against unemployment, austerity, home foreclosures, union busting, environmental degradation, student debt or the corrupting power of money in politics: OWS activists embrace *all* these causes and link them to overweening corporate power.

Can the movement already have notched up a victory in just two months? In OWS has sparked conversations and debates across the US about matters that have hardly entered mainstream public discourse in recent years. It has also spawned a growing number of demonstrations and political initiatives by providing a focal point around which groups with a wide range of specific grievancesunions, community groups, students, anti-war groups, environmental activistshave gravitated, piggy-backing on the growing media and public interest in the movement. We can now speak of a loose OWS coalition that encompasses these groups.

The key question, still unanswered, is how the movement will transform the anger and excitement it has helped to generate into real leverage against its adversaries. Most of the core OWS activists are students or unemployed (or irregularly employed) youth who do not play a strategic role or have any other direct influence within the powerful banks and corporations they eloquently criticise. What muscle the movement is able to muster is more likely to come from organised groups with at least some leverage in important institutions which have begun to coalesce around OWS community organisations, student groups and

especially trade unions. But the crisis has put these groups and unions (which were already weakened) on the defensive. What's more, union officials in the US (with a few exceptions), do not share the anti-corporate worldview or militant tactics of OWS activists.

Another threat to OWS comes from liberal Democratic politicians who would love to divert and channel its energy into their own electoral campaigns in 2012. As Robert Reich, labour secretary under Bill Clinton, recently pointed out, it is exceedingly unlikely that OWS will push the Democratic Party to embrace anything like anti-corporate politics. The Democrats are far too dependent on corporate money, media and connections to move more than a centimetre or two in this direction. Yet some Democratic politicians will no doubt try to present themselves to the public as anti-corporate populists, to draw on OWS energy and enthusiasm as even President Obama sometimes did in 2008, despite his close ties to Wall Street.

Will this strategy work? Clearly not with the core OWS activists, whose disdain for liberal Democrats like Obama and New York senator Charles Schumer, another Wall Street favourite, is palpable. However, some of the groups and unions that are part of the broader OWS coalition will certainly plunge into Democratic Party campaigns next year, along with some students and others who have not fully bought into the critique of corporate power, and the Democratic Party. Many of today's enthusiasts may peel off as we head into next election season.

http://mondediplo.com/2011/11/06ows

Shared Genes With Neanderthal Relatives: Modern East Asians Share Genetic Material With Prehistoric Denisovans

New research shows that people in East Asia share genetic material with Neanderthal-related hominids called Denisovans. (Credit: © lily / Fotolia)

ScienceDaily (Oct. 31, 2011) — During human evolution our ancestors mated with Neanderthals, but also with other related hominids. In this week's online edition of *Proceedings of the National Academy of Sciences*, researchers from Uppsala University are publishing findings showing that people in East Asia share genetic material with Denisovans, who got the name from the cave in Siberia where they were first found.

"Our study covers a larger part of the world than earlier studies, and it is clear that it is not as simple as we previously thought. Hybridization took place at several points in evolution, and the genetic traces of this can be found in several places in the world. We'll probably be uncovering more events like these," says Mattias Jakobsson, who conducted the study together with Pontus Skoglund.

Previous studies have found two separate hybridization events between so-called archaic humans (different from modern humans in both genetics and morphology) and the ancestors of modern humans after their emergence from Africa: hybridization between Neanderthals and the ancestors of modern humans outside of Africa and hybridization between Denisovans and the ancestors of indigenous Oceanians. The genetic difference between Neandertals and Denisovans is roughly as great as the maximal level of variation among us modern humans.

The Uppsala scientists' study demonstrates that hybridization also occurred on the East Asian mainland. The connection was discovered by using genotype data in order to obtain a larger data set. Complete genomes of modern humans are only available from some dozen individuals today, whereas genotype data is available from thousands of individuals. These genetic data can be compared with genome sequences from Neandertals and a Denisovan which have been determined from archeological material. Only a pinky finger and a tooth have been described from the latter.

Genotype data stems from genetic research where hundreds of thousands of genetic variants from test panels are gathered on a chip. However, this process leads to unusual variants not being included, which can lead to biases if the material is treated as if it consisted of complete genomes. Skoglund and Jakobsson used advanced computer simulations to determine what this source of error means for comparisons with archaic genes and have thereby been able to use genetic data from more than 1,500 modern humans from all over the world.

"We found that individuals from mainly Southeast Asia have a higher proportion of Denisova-related genetic variants than people from other parts of the world, such as Europe, America, West and Central Asia, and

Africa. The findings show that gene flow from archaic human groups also occurred on the Asian mainland," says Mattias Jakobsson.

"While we can see that genetic material of archaic humans lives on to a greater extent than what was previously thought, we still know very little about the history of these groups and when their contacts with modern humans occurred," says Pontus Skoglund.

Because they find Denisova-related gene variants in Southeast Asia and Oceania, but not in Europe and America, the researchers suggest that hybridization with Denisova man took place about 20,000-40,000 years ago, but could also have occurred earlier. This is long after the branch that became modern humans split off from the branch that led to Neandertals and Denisovans some 300,000-500,000 years ago.

"With more complete genomes from modern humans and more analyses of fossil material, it will be possible to describe our prehistory with considerably greater accuracy and richer detail," says Mattias Jakobsson.

Story Source:

The above story is reprinted from materials provided by **Uppsala University**, via AlphaGalileo.

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A good imagination and a pile of junk

Time to stop and stare
If we know exactly what our research is meant to deliver, and have no time or energy to wander beyond that, then creative thinking is over
by David Napier

As an academic on leave in Switzerland I look out over Minusio, the Italian-Swiss village that hosted the novelist Herman Hesse after he moved to Ticino in 1919. He finished his novella about the search for spirituality in ancient India, *Siddhartha*, in 1922 after he moved to nearby Montagnola, but the book only became popular later when translated into English for soul-searchers of the 1960s and 70s.

They took this powerful little book, wrongly, as a celebration of Buddhism, but it was in fact a critical reflection on what he felt was Buddhism's "flawed" doctrine of salvation the doctrine embraced by Buddhists of the West who aspired to follow in *Siddhartha*'s footsteps, toting the volume around as a hitchhiker's sign to any place but here. Another half a century on, it is worth remembering that the book was intended to show how creative outcomes are often inhibited by our determination to achieve them. Hesse's protagonist, Siddhartha, ultimately succeeds not through his own epic quest, but through the monotonous act of ferrying other travellers back and forth across a river an easy metaphor for what creativity theorist Edward de Bono calls "lateral thinking".

In his *New Think* of 1967 de Bono describes methods for learning how not to be enslaved by step-by-step approaches to solving problems. Though he offers concrete steps for casting off debilitating linear assumptions, the crucial point is that we can't find something we have not thought of if the process we employ only tells us what we already suspect. To this truth one might add an important caveat: if we have to show in advance to some auditor what "deliverables" our research will provide, there is no way that the work will take us laterally across domains of knowledge to a new place we have never visited a place that an impact assessor would have challenged our right even to approach.

The problem of horse dung

This obsession with finding what we are looking for is also why we so often mistake innovation for invention. Innovators are anything but inventors: they offer deliverables because their focus is on taking something already known and improving it. They engage in what patent lawyers call "reverse engineering": Japanese and Korean manufacturers did not invent the car or the computer, but they make them better than the rest of us. Getting funding for innovation is relatively easy: the demonstrably better mousetrap saves money and delivers more dead vermin.

But just over a century ago the world's greatest thinkers agreed that a big problem of the future would be the accumulation of horse dung, caused by the transport needs of a ballooning population: see how unimaginative we are in predicting genuinely new things and their effects on how we live? That's a major reason why only 3% of all inventions deemed new and useful by experienced patent reviewers ever make a profit for their inventors. The remaining 97% are either out there waiting for time to catch up or, like Hesse's novella, taken up by the wrong people and put to some inferior if not wholly inappropriate use. New and useful things also languish because they're ignored: it's hard to find patronage for what others cannot imagine. 3M saw no use for a glue that did not really stick until employees discovered how useful post-it notes could be after an inventor left them lying about the place.

This morning, as I take a long look across the valley at Minusio and around the studio in which I paint, I am reminded of Thomas Edison, who said that to create one needed "a good imagination and a pile of junk". For Edison, the pile of junk was not an annoyance but a morass of imagined, lateral possibilities, a collage of

relationships waiting to be seen in a new way. Impressive literature on creativity shows how important having a pile of junk is to creating new things, providing the superimposed structures used by a good *bricoleur* to discover the unlikely combinations necessary for producing something new (1).

This may explain why outcome-driven funders so infrequently support important discoveries; how could they when the methods they promote directly undermine what we already know about nourishing creativity? Limiting freedom of thought may be our best weapon against moving intuitions forward.

Is it any wonder then that so little comes out of the demands from government or charity that we remove the pile of junk, make "better" use of the wasted space it occupies, and punish any would-be Edison for having squandered our precious resources? How can we expect genius to emerge from sponsored research? Under the current terms of engagement, let's face it: genius can't emerge. Full stop.

Diagonal thinking

Some four-and-a-half centuries ago a distant member of my Scottish clan invented logarithms, and with them the first analogue calculating device the predecessor to the slide rule we all used until digital calculators showed up. John Napier invented both logarithms and our first computer through lateral or in his case diagonal thinking: place columns of numbers side by side, read obliquely across them, and they calculate. The machine was called "Napier's Bones", and it took him decades of looking at numbers in parallel, lateral and diagonal columns to arrive at a conclusion so simple that nobody could imagine how it hadn't been already discovered. We also got from him some other now-essential things, like the first systematic use of the decimal point in base 10. (His own era most loved him for his attacks on the Papacy and his use of the Book of Revelations to predict an Apocalypse that would end the world by the dawn of the 18th-century.)

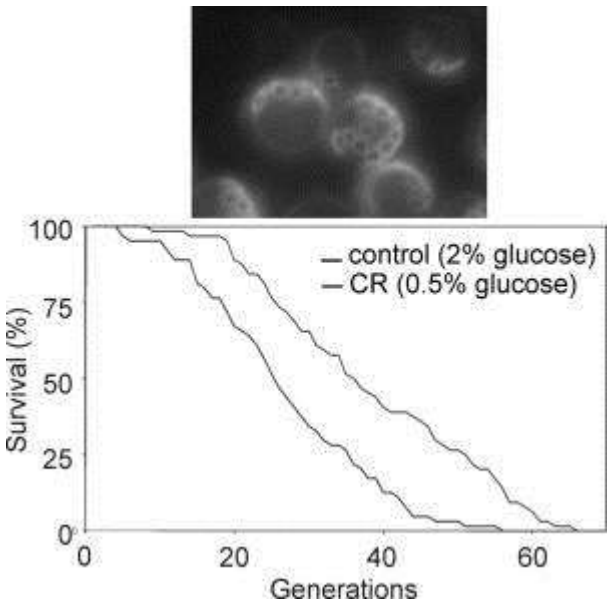
No uncounted time for imagining, no logarithms; no logarithms, no rapid navigation; no rapid navigation, no naval superiority; no naval superiority, no exploration; no exploration, no Empire; no Empire, no global dominance. It is not a legacy I should be proud of, but then John Napier was not proud of it. He was so fearful of the military applications of his inventive thinking that he had evidence of the potential use of his inventions for weaponry destroyed before he died. At least, unlike Hesse, he anticipated what misuse might come of his creations were his Apocalypse predictions to fail, as they did.

Apart from being tenacious and eccentric, what enabled John Napier to think up so many useful and useless ideas? Napier, like Edison, was sponsored in Napier's case not by the Industrial Revolution but, as the 8th Laird of Merchiston, by his own peasantry. Personal resources gave him the time to let his imagination work again and again over the accumulation of numbers (junk to the linear bean counters of his day). Junk needs time: decades after Napier, the Baroque sculptor Bernini used his liberal sponsorship by the Papacy also to make time for the unexpected to happen. As Bernini put it, it was not to make something beautiful, but to make an apparent flaw so much the centrepiece of a new work of art that no one could imagine it without that imperfection (the philosophy of the piece of junk).

Today, as neoliberal governments attack education's free spaces, sell off the last of our hard-earned collective resources to cook their bookkeeping, and promise yet more of what Donald Rumsfeld might have called "undelivered deliverables", we must wonder if Keynes wasn't right when he labelled such government cuts "the paradox of thrift" (2). Keynes argued that, in times of economic crisis and private fiscal reticence, governments should increase, not decrease, their deficit investments in the public sector; for otherwise there can be no universities or other imaginative spaces where some discoverer, perhaps even Albert Einstein, might wander around in his slippers asking strangers to help him find his way across the next river.

http://mondediplo.com/2011/11/16inventors

Live Longer With Fewer Calories? Key Enzyme Involved in Aging Process Found



Yeast. (Credit: Mikael Molin)

ScienceDaily (Oct. 31, 2011) — By consuming fewer calories, aging can be slowed down and the development of age-related diseases such as cancer and type 2 diabetes can be delayed. The earlier calorie intake is reduced, the greater the effect. Researchers at the University of Gothenburg have now identified one of the enzymes that hold the key to the aging process.

"We are able to show that caloric restriction slows down aging by preventing an enzyme, peroxiredoxin, from being inactivated. This enzyme is also extremely important in counteracting damage to our genetic material," says Mikael Molin of the Department of Cell and Molecular Biology.

By gradually reducing the intake of sugar and proteins, without reducing vitamins and minerals, researchers have previously shown that monkeys can live several years longer than expected. The method has also been tested on everything from fishes and rats to fungi, flies and yeasts with favourable results. Caloric restriction also has favourable effects on our health and delays the development of age-related diseases. Despite this, researchers in the field have found it difficult to explain exactly how caloric restriction produces these favourable effects.

Using yeast cells as a model, the research team at the University of Gothenburg has successfully identified one of the enzymes required. They are able to show that active peroxiredoxin 1, Prx1, an enzyme that breaks down harmful hydrogen peroxide in the cells, is required for caloric restriction to work effectively.

The results, which have been published in the journal *Molecular Cell*, show that Prx1 is damaged during aging and loses its activity. Caloric restriction counteracts this by increasing the production of another enzyme, Srx1, which repairs Prx1. Interestingly, the study also shows that aging can be delayed without caloric restriction by only increasing the quantity of Srx1 in the cell. Repair of the peroxiredoxin Prx1 consequently emerges as a key process in aging.

"Impaired Prx1 function leads to various types of genetic defects and cancer. Conversely, we can now speculate whether increased repair of Prx1 during aging can counteract, or at least delay, the development of cancer."

Peroxiredoxins have also been shown to be capable of preventing proteins from being damaged and aggregating, a process that has been linked to several age-related disorders affecting the nervous system, such as Alzheimer's and Parkinson's. The researchers are accordingly also considering whether stimulation of Prx1 can reduce and delay such disease processes.

Story Source:

The above story is reprinted from materials provided by **University of Gothenburg**.

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http://www.sciencedaily.com/releases/2011/10/111031215938.htm

Does Inequality Make Us Unhappy?

- By Jonah Lehrer
- November 3, 2011 |

Inequality is inevitable; life is a bell curve. Such are the brute facts of biology, which can only evolve because some living things are better at reproducing than others. But not all inequality is created equal. In recent years, it's become clear that many kinds of wealth disparity are perfectly acceptable — capitalism could not exist otherwise — while alternate forms make us unhappy and angry.

The bad news is that American society seems to be developing the wrong kind of inequality. There is, for instance, this recent study published in *Psychological Science*, which found that, since the 1970s, the kind of inequality experienced by most Americans has undermined perceptions of fairness and trust, which in turn reduced self-reports of life satisfaction:

Using the General Social Survey data from 1972 to 2008, we found that Americans were on average happier in the years with less income inequality than in the years with more income inequality. We further demonstrated that the inverse relation between income inequality and happiness was explained by perceived fairness and general trust. That is, Americans trusted others less and perceived others to be less fair in the years with more income inequality than in the years with less income inequality. **Americans are happier when national wealth is distributed more evenly than when it is distributed unevenly.**

It's now possible to glimpse the neural mechanisms underlying this inequality aversion, which appears to be a deeply rooted social instinct. Last year a team of scientists at Caltech published a fascinating paper in *Nature*. The study began with 40 subjects blindly picking ping-pong balls from a hat. Half of the balls were labeled "rich," while the other half were labeled "poor." The rich subjects were immediately given $50, while the poor got nothing. Life isn't fair.

The subjects were then put in a brain scanner and given various monetary rewards, from $5 to $20. They were also told about a series of rewards given to a stranger. The first thing the scientists discovered is that the response of the subjects depended entirely on their starting financial position. For instance, people in the "poor" group showed much more activity in the reward areas of the brain (such as the ventral striatum) when given $20 in cash than people who started out with $50. This makes sense: If we have nothing, then every little something becomes valuable.

But then the scientists found something strange. When people in the "rich" group were told that a poor stranger was given $20, their brains showed more reward activity than when they themselves were given an equivalent amount. In other words, they got extra pleasure from the gains of someone with less. "We economists have a widespread view that most people are basically self-interested and won't try to help other people," Colin Camerer, a neuroeconomist at Caltech and co-author of the study, told me. "But if that were true, you wouldn't see these sorts of reactions to other people getting money."

What's driving this charitable brain response? The scientists speculate that people have a natural dislike of inequality. In fact, our desire for equal outcomes is often more powerful (at least in the brain) than our desire for a little extra cash. It's not that money doesn't make us feel good — it's that sharing the wealth can make us feel even better.

In reality, of course, we're not nearly as egalitarian as this experiment suggests. After all, the top 1 percent of earners aren't exactly lobbying for higher taxes or for large lump-sum payments to those on welfare. (The exceptions, like Warren Buffett, prove the rule.)

What explains this discrepancy? It's probably because the rich believe they deserve their riches. Unlike the subjects in the Caltech study, whose wealth was randomly determined, the top earners in America tend to feel that their salaries are just compensation for talent and hard work. (Previous research has demonstrated that making people compete for the initial payout can dramatically diminish their desire for equal outcomes.) The end result is that our basic aversion to inequality — the guilt we might feel over having more — is explained away, at least when we're at the top.

A similar lesson emerges from a classic experiment conducted by Franz de Waals and Sarah Brosnan. The primatologists trained brown capuchin monkeys to give them pebbles in exchange for cucumbers. Almost overnight, a capuchin economy developed, with hungry monkeys harvesting small stones. But the marketplace was disrupted when the scientists got mischievous: instead of giving every monkey a cucumber in exchange for pebbles, they started giving some monkeys a tasty grape instead. (Monkeys prefer grapes to cucumbers.) After witnessing this injustice, the monkeys earning cucumbers went on strike. Some started throwing their cucumbers at the scientists; the vast majority just stopped collecting pebbles. The capuchin economy ground to a halt. The monkeys were willing to forfeit cheap food simply to register their anger at the arbitrary pay scale.

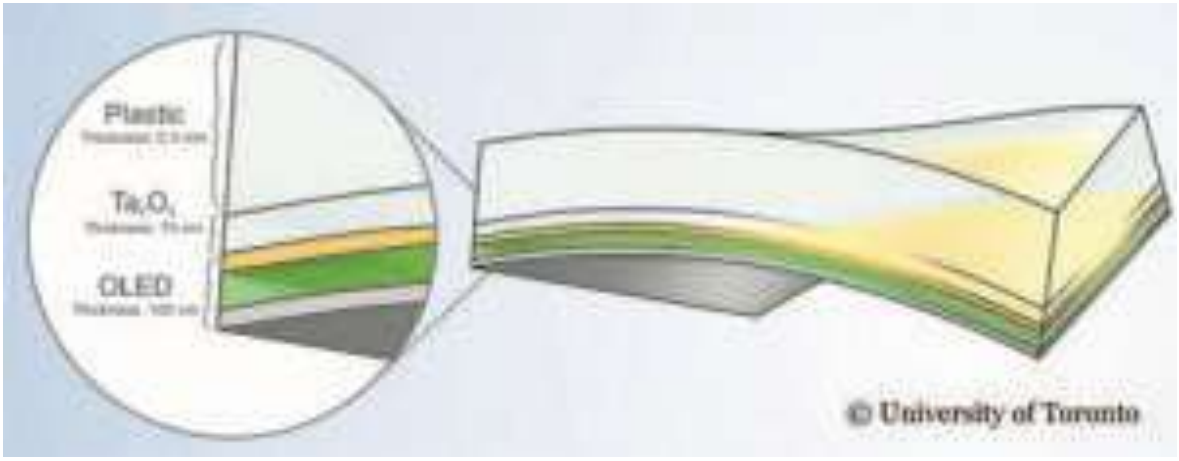
This labor unrest among monkeys illuminates our innate sense of fairness. It's not that the primates demanded equality — some capuchins collected many more pebbles than others, and that never created a problem — it's that they couldn't stand when the inequality was a result of injustice. Humans act the same way. When the rich do something to deserve their riches, nobody complains; that's just the meritocracy at work. But when those at the bottom don't understand the unequal distribution of wealth — when it seems as if the winners are

getting rewarded for no reason — they get furious. They doubt the integrity of the system and become more sensitive to perceived inequities. They start camping out in parks. They reject the very premise of the game.

Image: Mark Riffee/Wired.com

http://www.wired.com/wiredscience/2011/11/does-inequality-make-us-unhappy/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+wired%2Findex+%28Wired%3A+Index+3+%28Top+Stories+2%29%29

World's Most Efficient Flexible Organic Light-Emitting Diodes Created On Plastic



Wang and Helander were able to re-construct the high-refractive index property previously limited to heavy metal-doped glass by using a 50-100 nanometre thick layer of tantalum(V) oxide (Ta_2O_5), an advanced optical thin-film coating material. This advanced coating technique, when applied on flexible plastic, allowed the team to build the highest-efficiency OLED device ever reported with a glass-free design. (Credit: © University of Toronto)

ScienceDaily (Oct. 31, 2011) — Researchers in the University of Toronto's Department of Materials Science & Engineering have developed the world's most efficient organic light-emitting diodes (OLEDs) on plastic. This result enables a flexible form factor, not to mention a less costly, alternative to traditional OLED manufacturing, which currently relies on rigid glass.

The results are reported online in the latest issue of *Nature Photonics.*

OLEDs provide high-contrast and low-energy displays that are rapidly becoming the dominant technology for advanced electronic screens. They are already used in some cell phone and other smaller-scale applications.

Current state-of-the-art OLEDs are produced using heavy-metal doped glass in order to achieve high efficiency and brightness, which makes them expensive to manufacture, heavy, rigid and fragile.

"For years, the biggest excitement behind OLED technologies has been the potential to effectively produce them on flexible plastic," says Materials Science & Engineering Professor Zheng-Hong Lu, the Canada Research Chair (Tier I) in Organic Optoelectronics.

Using plastic can substantially reduce the cost of production, while providing designers with a more durable and flexible material to use in their products.

The research, which was supervised by Professor Lu and led by PhD Candidates Zhibin Wang and Michael G. Helander, demonstrated the first high-efficiency OLED on plastic. The performance of their device is comparable with the best glass-based OLEDs, while providing the benefits offered by using plastic.

"This discovery, unlocks the full potential of OLEDs, leading the way to energy-efficient, flexible and impact-resistant displays," says Professor Lu.

Story Source:

The above story is reprinted from materials provided by **University of Toronto Faculty of Applied Science & Engineering**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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http://www.sciencedaily.com/releases/2011/10/111031121229.htm

Study: Ethical People More Satisfied With Life

University of Missouri economist Harvey James finds a relationship between life satisfaction and low tolerance for unethical conduct.

By Tom Jacobs

Economist finds a correlation between how people responded to ethics questions and their satisfaction with life.

"The just man is happy, and the unjust man is miserable," Plato declares in *The Republic*. A noble thought, to be sure, but Socrates' most famous student didn't have data to back up his belief. Harvey James, on the other hand, does. The University of Missouri economist finds a relationship between life satisfaction and low tolerance for unethical conduct. He discussed his findings, first published in the journal *Kyklos*, with *Miller-McCune* staff writer Tom Jacobs.

The research

"I found a correlation between how people responded to ethics questions and their satisfaction with life. As part of the 2005-06 wave of the World Values Survey (which examines attitudes around the globe), respondents were asked in face-to-face interviews: On a scale of 1 to 10, how satisfied are you with your life? There were also four ethics questions that ask how acceptable or unacceptable they felt a particular practice is: claiming government benefits to which you are not entitled; avoiding paying your fare on public transportation; cheating on taxes; and accepting a bribe.

"What I found is, generally, people who believe that these particular ethical scenarios are not acceptable also tend to indicate they are more satisfied with life. That's with controlling for other factors that scholars have shown are also correlated with happiness, including relative wealth."

The limitations

"Admittedly, this measure of ethics is less than ideal. It certainly does not reveal the actual behavior of people. However, the four statements have a common, underlying ethical construct, which is that each of them expresses an action that could either directly or indirectly harm others, or society generally. Also, the measure of happiness is relatively crude. If someone asks you how satisfied you are with your life, your answer can be affected by many things that happened to you that particular day or week or month.

"Correlation or causation? It could be that a strong set of ethics affects happiness; it could be the other way around; or it could be something else that's affecting both of them. My personal belief is that not being willing to justify ethically questionable behaviors may improve a person's psychological well-being, perhaps because he or she avoids feelings of guilt or shame. This could in turn produce an increase in happiness."

Cultural variations

"My original desire was to use all the countries for which data was available, but different cultures may view these particular scenarios differently. So, I scaled back and looked at four countries in the Western Hemisphere: The U.S., Canada, Mexico, and Brazil. I found that, generally, there is a positive correlation between [ethical standards] and happiness, but the strength of that relationship differs from one nation to another. The effect of the ethics variable was much stronger and larger for Brazilians than for people in the United States. Brazil, like much of South America, has a stronger religious culture. That may be part of the reason."

Larger implications

"These findings are consistent with the view that happiness is derived from doing well, and from meeting psychological rather than material or hedonistic needs. While income, personal characteristics and societal values play a role in affecting happiness, so do personal ethics. If the goal of public policy is to improve subjective well-being, and if subjective well-being increases when people are just, then efforts to improve the moral behavior of people will also improve overall societal well-being."

http://www.miller-mccune.com/culture/study-ethical-people-more-satisfied-with-life-36792/

Savannas and Forests in a Battle of the Biomes

Princeton researchers report that savanna wildfires — such as this one in South Africa — maintain the balance between forest and savanna, but that these blazes may be susceptible to human activity. The border between the habitats could degenerate into patches of encroachment in some areas. The researchers suggest forests that experience less rainfall due to climate change could become more prone to land-clearing fires. At the same time, the breakup of the savanna through land use, fire-prevention measures and road construction could disrupt the natural path of fires, presenting an opportunity for forests to take root. (Credit: Carla Staver)

ScienceDaily (Oct. 31, 2011) — Climate change, land use and other human-driven factors could pit savannas and forests against each other by altering the elements found by Princeton University researchers to stabilize the two. Without this harmony, the habitats, or biomes, could increasingly encroach on one other to the detriment of the people and animals that rely on them.

The Princeton researchers reported this month in the journal Science that savanna wildfires, combined with climate conditions, maintain the distinct border between savannas and forests in many tropical and subtropical areas. Savanna fires keep tree cover low and prevent forests from encroaching on the grassland. When tree cover is high, as in a forest, fires cannot spread as easily, halting the savanna's advance into the forest.

But the Princeton team's findings suggest that savanna wildfires could be heavily influenced by factors such as climate change, road construction and fire-prevention measures. Less rainfall can result in an uptick in fires that can transform a forest into a savanna, just as breaking up the landscape through road construction and fire control disrupt natural blazes and allow a forest to sprout where there once was a savanna.

The researchers suggest that because of these factors, large stretches of South American and African forest and savanna could degenerate into chaotic mutual encroachment. The changeover from one biome to the other -- which can happen within several decades -- can be extremely difficult to reverse once it has happened, explained lead author Carla Staver, a doctoral student in the laboratory of co-author Simon Levin, the Moffett Professor of Biology in Princeton's Department of Ecology and Environmental Biology. She and Levin worked with co-author Sally Archibald, a senior research scientist at the Council for Scientific and Industrial Research in South Africa.

Plants and animals that thrive in a forest or savanna often cannot transition from one habitat to the other, Staver said. The Science paper illustrates that the loss of savanna to forest is just as ecologically traumatic -- though less well known -- as deforestation, she said.

"Savanna and forest are definitely not locally compatible," she said. "There is a risk of losing plants and animals endemic to one or the other, which would affect the people who depend on those species.

"Savannas, for instance, are useful to people as cattle rangeland," she said. "When forests encroach, the grass productivity decreases dramatically and the land becomes much less useful. In terms of livelihood, that would have a huge impact."

The team's work provides among the first experimental evidence that fire feedback -- the ecological effect of fires -- is the dominant force in maintaining the division between forests and savannas, and that it can determine where the habitats flourish. The researchers used satellite data of fire distributions -- combined with climate and soil data, as well as satellite data of tree cover -- to survey the tropical and subtropical regions of Africa, Australia and South America.

The researchers found that the frequency of fires determines whether forest or savanna will dominate an area more than other factors such as rainfall, seasons and soil texture, especially in areas with moderate precipitation. Regular fires prevent trees from establishing and savannas from turning into forest. A lack of fires allows a forest to develop, which in turn excludes future fires.

Human alterations to the climate and landscape, however, may disrupt the natural spread of fire in many areas and lead to very rapid changes in biome distribution, the Princeton researchers suggest. Direct actions such as building roads and deploying methods such as controlled burning that prevent the natural spread of wildfires could break up savannas, altering wildfires and allowing forests to take root. At the same time, drier conditions -- particularly in areas now experiencing diminished monsoons -- rob forests of their primary safeguard against fire, rain.

Under these circumstances, a forest can overtake a savanna, or vice versa, in a matter of decades, and a return to the original terrain would prove exceedingly difficult, even if the original climate conditions return, Staver said.

"If a savanna were to turn into a forest, for instance, that change would be quite sudden, much quicker than we might expect, and it would be hard to reverse," Staver said. "You'd cross a threshold where fire cannot spread anymore. Conversely, if a forest dried out and fire started to spread, it could turn into a savanna, maintained by fire. The magnitude of change needed to return a biome to its original state would be much more than it needed to change in the first place."

The Princeton research could be significant in determining the "future trajectory" of global forest cover, and also illustrates the natural obstacles to restoring cleared forests, said Brian Walker, who studies ecological sustainability and resilience as a research fellow at the Commonwealth Scientific and Industrial Research Organization in Australia.

"Savanna systems are very resilient across a range of climatic and herbivore variation, in regard to fire. Forest systems are less so, except under very high rainfall where fire cannot be regular," said Walker, who had no role in the Princeton research but is familiar with it.

"In the case of rainforests, once they are in a state where fire can play a role and therefore keep the system in a savanna state, it is extremely difficult to prevent fires from recurring, and so the chances of a savanna state getting back to rainforest are small. In the original forest state, the amount of dry fuel in the ground layer is insufficient for fire to take hold and 'run.'"

In a broader sense, the Princeton findings stress that encroachment is not a threat unique to forests, Staver said.

"There's a sense among savanna ecologists that the loss of savanna is considered secondary to deforestation as a conservation concern, but it really shouldn't be. The loss of functionality and diversity in the savanna is just as important as in forests.

"At the moment, we can't say that one is winning out over the other," Staver said. "We can come up with examples where savannas are encroaching into forests and forests are encroaching into savannas. Both are happening extensively, and both are really huge issues that are likely to become even more important."

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Story Source:

The above story is reprinted from materials provided by **Princeton University**. The original article was written by Morgan Kelly.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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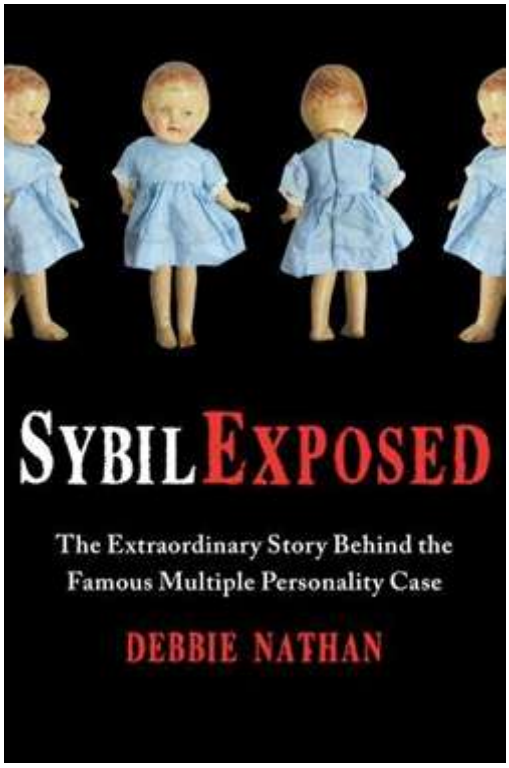
http://www.sciencedaily.com/releases/2011/10/111031220600.htm

Made to Disorder
When mental disorders are a cultural product.

By Jessa Crispin



Your therapist is probably giving you multiple personality disorder.

- ***Medical Muses: Hysteria in Nineteenth-Century Paris*** **by Asti Hustvedt. 372 pages. W.W. Norton & Company. $26.95.**
- ***Sybil Exposed: The Extraordinary Story Behind the Famous Multiple Personality Case*** **by Debbie Nathan. 320 pages. Free Press. $26.**

Oh sure, he's going to deny it. He will say you obviously had some problems to begin with, and that he just uncovered the form they're taking and their source. And there you will be, disassociated into several different personalities. People you don't know will greet you with names you don't recognize. You'll find notes around your apartment written in unfamiliar handwriting. You'll walk into hotel rooms without pants (every person who has ever had multiple personality disorder has always had one who was a slut).

And maybe by the end of it you will remember seeing your father drink the blood of a newborn baby. So strange that you had forgotten something like that for the last twenty years, you think it would be a pretty memorable event. Or being raped by your brother. Never mind the fact that you never had a brother, you are sure it happened. And your therapist will say, Aha! That is why you are such a mess, can't keep a boyfriend or a job for more than six weeks, that is why you dread going home for Christmas. It's because you remember your parents donning black robes and smearing the blood of a virgin all over your face before they let their friends have their way with you on a Satanic altar. That must be it.

Oh, and that will be $250, sweetie. You can leave the check with the receptionist.

Back in the 1980s, multiple personality disorder was a thing. *The* thing. You don't hear so much about it today; it's like we all woke up one day and thought, right, probably not possible after all, let's move on. But when MPD was hot, it wasn't just something to be burdened with, a problem to be overcome: It was something to be proud of. Look at how complex you are, you contain multitudes, literally! Gloria Steinem called MPD "a gift." As Debbie Nathan tells it in *Sybil Exposed: The Extraordinary Story Behind the Famous Multiple Personality Case*, after the disorder became an official diagnosis in the *The Diagnostic and Statistical Manual of Mental Disorders*, hundreds of thousands of MPD diagnoses were made. Psychiatrists were calling it an epidemic; they claimed that potentially millions of Americans (mostly women) had this affliction/gift.

At the base of this disorder was abuse. Abuse so intense and dramatic that it was wiped from victims' memory but still shattered their psyches. From the mid-1980s to the early '90s, on *Oprah*, on *Sally Jessy Raphael*, on *Maury*, on *Geraldo*, doctors and victims and Satanic specialists told us that our country was in the grips of a devilish epidemic. Underground cults were ritualistically abusing the nation's children; black magic gatherings were slaughtering untold numbers of newborn babies (the ever-renewable source of newborn babies was never revealed). This had been discovered not through forensic evidence, but through memories recovered, a great many of them from multiple personality disorder patients.

But there was also something else at the base of this disorder. It was the strange and mysterious dynamic between analyst and analyzed, between healer and patient.

If you remove any details that reveal time or place, stories of fragile, impressionable young girls who go into psychiatric treatment for mysterious ailments begin to sound oddly similar. As so often happens when you're chasing a historic mystery, one story tugs on another, and women through time find themselves in the same situation over and over again — the dress and setting is different, but they are all essentially playing the same role. The symptoms and the diagnoses of the frightened patients may change from idiopathic paralysis to blackouts, and the treatment from ovarian compressions to psychotropic medication, but a pattern emerges nonetheless.

So Blanche in Asti Hustvedt's *Medical Muses: Hysteria in Nineteenth-Century Paris* became Alice James in late 19th-century Boston in Jean Strouse's biography. They both became Sybil in 1970s New York City, and also Erika and Julie Ingram in 1988 Olympia, Washington in Lawrence Wright's *Remembering Satan: A Tragic Case of Recovered Memory*. Hustvedt notes the strange contagious properties of these disorders, and how quickly a mental illness — something that is supposed to be innate, a "chemical imbalance" with biological roots — can become a cultural fad. "As was true for hysteria, these contemporary disorders [anorexia, bulimia, self-mutilation, chronic fatigue syndrome, and multiple personality disorder] are thought to be contagious, spread by suggestion, imitation, and therapy." And like hysteria, which was all the rage in the 19th century, multiple personality disorder and recovered memories swept through the lives of a great number of girls and women before disappearing almost completely. After all, no one comes down with a case of hysteria anymore.

We learn how to be mad, the same way we learn how to be male or female, or how we learn how to participate in society. We look to others we respect and imitate their behaviors. We follow the instructions of teachers and parents, and we are subtly punished or rewarded for various quirks until we learn to mold ourselves in a certain way to avoid responses we don't like and attain the responses we do. We're not all superstitious pigeons trapped in Skinner's boxes, flapping our wings and hoping for food pellets over electrical shocks, but the behaviorists did manage to get a few things right.

And so here we have a collection of strange girls who had been through some shit. Blanche (real name Marie Wittmann, Blanche being the name of the case study that made her famous) came from a poor, abusive home

in Paris. She went to work at the age of 12 and ended up in the home of a man who regularly raped her. By the time she entered the Salpêtrière Hospital at 18, she was plagued by a host of mysterious symptoms.

Alice James was the only girl in a family ruled by a patriarchal father. He uprooted the lot of them time and time again, moving between Newport and Switzerland and Paris and London and Boston. Her only possible escape was marriage, but she had the misfortune to come of age in the post-Civil War era, when single women outnumbered single men by a very wide margin.

Sybil, whose real name was Shirley Mason, was raised in a restrictive religious household. She was punished harshly as a child for reading and writing fiction, and for drawing unrealistic landscapes.

Erika Ingram was raised by a cold father in a large, financially unstable and fundamentalist family. She may have encountered real abuse by either her brothers or her father, but her stories of rape and molestation became so fantastical that it's kind of hard to tell.

Each woman had serious problems and a background of deprivation and tumult. Each had a certain physical, mental, and emotional fragility. And each woman found herself in an environment where she could practice her illness. Hustvedt writes that the hysterics of Salpêtrière learned how to act from each other. When they were placed in a ward with epileptics, convulsive fits became a central part of the hysterical attack. And when one woman had an attack, the effect would role down the ward until all the women were frothing and writhing.

Blanche's symptoms also began to match the predictions of her doctor, Jean-Martin Charcot. He was working on a theory about the stages of hysteria and was delighted to find that his most public patient (these were the days, after all, when tourists could come to the hospital and watch demonstrations of hysterical behavior) acted out these stages with perfect timing. Hustvedt writes, "Marie entered with a myriad of vague and difficult-to-diagnose afflictions, and emerged as Blanche, an exemplary hysteric whose symptoms perfectly fit Charcot's schema." Having had very little experience with the good kind of masculine attention — what with a father who tried to throw her out the window and a boss who beat her if she didn't sexually submit to him — it's no wonder this woman would unconsciously fulfill Charcot's desires. In return for her fits, her hypnotized performances, and her unexplained paralysis, she received a safe place to live, the loving attention of doctors, and the company of women.

Sybil closely followed Blanche's example. Where Dr. Charcot wanted hysteria, Sybil's doctor Connie Wilbur wanted multiple personality disorder. Sybil came to Dr. Wilbur already a bit of a wreck with gaping, grasping emotional needs. When Sybil presented dissociation problems, hinting that sometimes she felt not in control of her body and couldn't account for periods of time, she found Dr. Wilbur willing to be at her beck-and-call, willing to take her phone calls at all hours of the night, to help her get a job, to assist her financially and give her treatment without payment. She rewarded Dr. Wilbur by splintering even further, shooting off one personality after another, exaggerating recovered memories of abuse by her mother. She was willing to sacrifice her own flawed, deceased mother in exchange for a mother-daughter relationship with her therapist.

At one point, before the publication of *Sybil* — the book that would make them all famous and spread multiple personality disorder like the flu — Sybil backed down, admitting to Dr. Wilbur that it had all been an act. "I am not going to tell you that there isn't anything wrong," she wrote in a letter. "But it is not what I have led you to believe... I do not have any multiple personalities... I do not even have a 'double'... I am all of them. I have essentially been lying." But Dr. Wilbur was also getting something out of this arrangement: fame and professional respect; she refused to believe the letter was honest. Sybil so miraculously fit into Wilbur's preconceived ideas of how MPD would manifest itself. The doctor brushed the letter off as the act of other personalities' attempts to integrate themselves into Sybil's consciousness.

Both Blanche and Sybil might have done better had they gone back to being Marie and Shirley. They may have recovered more thoroughly outside the care of their doctors. Many of Blanche's contemporaries on the

hysteric ward fared better outside the hospital walls. Whenever Sybil managed to put some distance between herself and Dr. Wilbur, she almost became a normal girl again. Nathan wrote, "Almost four years had passed since [she] first walked into Connie's office as an upbeat graduate student with nagging but bearable emotional problems. Now, after hundreds of hours of therapy and countless pills, shots, and machine-induced convulsions, she was a 35-year-old junkie who spent most of her time in bed." Both Blanche and Sybil chose the confines of their sickbeds over the burden of free will in real life. They both had emotional compensations for their physical torments. Their doctors, being thoroughly rewarded for keeping their patients sick, were happy to accommodate.

That choice to remain sick is perhaps best illustrated by the life of Alice James. She followed the French hysterics, when female vulnerability was the hot new thing in daily life. Jean Strouse, Alice James's biographer, writes, "With its range of meanings, from refined, sensitive, subtle, and gentle to sickly and frail, the word delicate described the mid-Victorian ideal of beauty: a graceful languor, pallor, and vulnerability — even to the point of illness — were seen as enhancing the female form... Illness, then, made a woman ethereal and interesting." Like the MPD that would follow, hysteria and neurasthenia (as it was known in the United States), became a gift to the afflicted. It gave them an allure. The demonstrations at Salpêtrière had a huge influence on female society and cases of hysteria spread. In Europe and the United States, women took to their bed with a variety of mysterious ailments, with "fits" and "attacks" breaking up the monotony.

Alice learned quickly that the easiest way to get her family's attention was with illness. Her brothers William, the philosopher, and Henry James, the novelist, also learned this and cultivated their own mysterious illnesses, but only Alice turned it into her career. Illness was rewarded with long continental cures paid for by her parents, devoted loving attention, and respite from the father's tyrannical rule. She had no devoted doctor to help give form to her diffuse illnesses, but she managed to shape them through the family's positive reinforcement. Soon Alice's timing was rivaling Blanche's. When her devoted brother William got married, she had a fit. When a woman she did not like joined a vacation, she had a fit. When her closest companion left to tend to an ill sister, she had a fit. Strouse writes, "Nothing could have regained the center of the stage for Alice more effectively than a nervous attack," and Alice wielded her attacks like weapons.

The interplay between performance and illness is a strange one. All the women suffered, and all the women had real illness. Alice died young of a very real breast cancer. When we come to the case of the Ingram sisters Ericka and Julie, you do want to believe they survived something atrocious, that a teenage girl wouldn't accuse her father of rape unless *something* happened, even if the memories recovered by a psychic healer were not the right ones. Sybil's very famous case, coupled with television sensationalism over supposed Satanic cults, led to thousands of women calling shelters and counselors, saying that they think maybe someone did something inappropriate. A counselor for abused women interviewed in *Remembering Satan* tells Wright that these recovered memories were difficult even for her to believe. And yet, she tells him, "Here's my dilemma. We are already struggling against a tidal wave of disbelief. It's a tidal wave! Nobody wants to believe how bad it really is for women and children." The performance of illness and its contagious qualities can make you question whether the illness is there at all.

The Sybil case, just like the hysteria case, hit a nerve as a metaphor for women's lives. Multiple personality disorder had been diagnosed before, most famously in Dr. Morton Prince's study of Miss Beauchamp in the early 20th century and in some of the French hysterics. But something about Sybil's case and its timing set off a society of women who felt divided against their own selves. Nathan writes, "The millions and millions of Sybil fans who came to think of themselves as capable of anything also felt so damaged by the cruelties of traditional family life that they could not trust their own mothers, much less their memories... Women and their social struggles were reduced to a bizarre illness. The cure was not critical inquiry or protest marches or efforts at the polls. Instead the cure was drugs and hypnosis." All of those women got something out of their new diagnoses, too: a sense of community, a sense of inner complexity, and the "gift" of MPD. And all of those doctors got to be on the cutting edge of mental illness research, excavating depths Freud could never have imagined.

The aftermath of these faddish illnesses is a strange one. Are we to believe that these women were faking? Did hysteria ever really exist? And now that the genesis of so many multiple personality disorders has been revealed as a fake, what of all those women whose dissociative disorders were their daily reality? Hustvedt argues that simply because madness is malleable does not mean that it does not exist, or that it is not a real problem: "The symptoms suffered by Blanche and other hysterics are no longer an acceptable way to express illness. Paralysis, for example, was a widespread symptom in the 19th century... Paralysis today is, for the most part, reserved for those who have suffered an accident or a disease of the spinal cord. We have our own 'symptom pool' to draw from: fatigue, headaches, irritable bowel, depression, anxiety... Blanche really 'had' hysteria. She lived during a period that allowed her to express her suffering in a particular way, through a particular set of symptoms, symptoms that are no longer an admissible way to express illness."

So maybe your therapist isn't giving you multiple personality disorder after all. What could he possibly be getting out of it? • *28 October 2011*

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http://www.thesmartset.com/article/article10281101.aspx

From Tropics to Poles: Study Reveals Diversity of Life in Soils

Down the rabbit hole: a new world of creatures awaits beneath the surface. (Credit: Diana Wall, Colorado State University)

ScienceDaily (Oct. 18, 2011) — Microscopic animals that live in soils are as diverse in the tropical forests of Costa Rica as they are in the arid grasslands of Kenya, or the tundra and boreal forests of Alaska and Sweden.

That conclusion is found in research results published Oct. 18 in the *Proceedings of the National Academy of Sciences*.

Scientists have generally accepted that a wider range of species can be found above ground at the equator than at Earth's poles.

But this study proves for the first time that the same rules don't apply to the nematodes, mites and springtails living underground.

The team of National Science Foundation- (NSF) funded ecologists includes Tiehang Wu and Jim Garey at the University of South Florida, Diana Wall at Colorado State University, Ed Ayres now at Neon Inc. in Colorado, and Richard Bardgett at the University of Lancaster in the United Kingdom.

"Scientist E.O. Wilson noted that the key to understanding Earth's biodiversity lies in exploration of its smallest life forms," said Matt Kane, program director in NSF's Division of Environmental Biology, which funded the research.

"Important affirmation of this idea is provided in this global study of animals, in which the significance of below-ground biodiversity is revealed."

This is the first comprehensive molecular analysis--at nearly a species resolution--of the global distribution of soil animals across a broad range of ecosystems from the tropics to the poles.

Soil samples were taken from 11 sites around the world, including tropical forest in Costa Rica, arid grassland in Kenya, warm temperate forest in New Zealand, shrub steppe of Argentina and tundra and boreal forest of Alaska and Sweden.

Through DNA testing, researchers found that each location had a diversity of soil animals, but that each ecosystem is unique with its own soil animals -- illustrating an "amazing diversity of species" that had never been discovered before, said Garey.

"On average, 96 percent of our identified soil animals were found at only a single location, suggesting that most soil animals have restricted distributions, or in other words, they are endemic," said Wall.

"This challenges the long-held view that these smaller animals are widely distributed. However, unlike most above-ground organisms, there was no indication that latitude made a difference in soil animal diversity."

"Mites and roundworms dominate soil ecology and contribute to the breakdown and cycling of nutrients in the soil," Garey said. "These animals are essential to the proper functioning of the soil ecosystem in natural and farmlands."

The researchers also examined how the global distribution of soil animals relates to factors such as climate, soil nutrient levels and above-ground biodiversity.

Results showed that sites with greater above-ground biodiversity appeared to have lower diversity beneath in soils.

The main factors explaining this low soil animal diversity at sites with high above-ground diversity were high levels of soil inorganic nitrogen availability and lower pH compared with other sites.

Some sites with high animal biodiversity, like the Kenyan grassland site, are considered more at risk due to land use and population increase.

Story Source:

The above story is reprinted from materials provided by **National Science Foundation**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. T. Wu, E. Ayres, R. D. Bardgett, D. H. Wall, J. R. Garey. **Molecular study of worldwide distribution and diversity of soil animals**. *Proceedings of the National Academy of Sciences*, 2011; DOI: 10.1073/pnas.1103824108

http://www.sciencedaily.com/releases/2011/10/111018111932.htm

Meerkats Recognize Each Other from Their Calls

Wild meerkats living in the Kalahari Desert in Southern Africa. (Credit: UZH)

ScienceDaily (Oct. 13, 2011) — Wild meerkats living in the Kalahari Desert in Southern Africa recognize group members from their calls, behavior researchers at the University of Zurich have established for the first time. The researchers assume that meerkats can tell the individual group members apart.

Recognizing other individuals from their voices is second nature to humans. Certain primates also have this ability. Whether other mammals that live in social groups are also able to do so, however, is unclear. Like with primates, vocal communication is vital for meerkats. They coordinate their activities with calls, such as to warn other group members of approaching predators, for instance, and thus stick together as a group. Behavior biologists from the University of Zurich have already managed to decipher many calls in meerkat communication. Now, however, they have become the first to establish that meerkats are able to distinguish individual calls.

Vocal recognition

Behavior biologists from the University of Zurich simulated the simultaneous presence of a group member in two different places in a novel playback experiment on wild meerkats in the Kalahari Desert of Southern Africa. Meerkats were played two different calls from the same group member one after the other. This physically impossible scenario was contrasted with a physically possible scenario where the meerkats heard calls from two different group members. According to the researcher in charge, Simon Townsend, the meerkats responded more strongly to the impossible scenario than to calls from two different individuals. The scientists concluded that meerkats can tell the individual members of a group apart from their calls.

Differentiated distinction

Meerkat colonies are highly organized and essentially divide their work into three roles: lookouts, hunters and babysitters. Until now, we had assumed that meerkats assigned their conspecific counterparts to these groups but do not differentiate them from one another. With this experiment, however, the behavior biologists have proved this assumption wrong. In both scenarios, calls from an equal-ranking group member were used. "We take it that meerkats can tell the individual group members apart. However, we don't yet know which cognitive mechanisms underlie this ability. Or whether the ability to tell group members apart is merely linked to auditory cues," says Townsend.

Story Source:

The above story is reprinted from materials provided by **University of Zurich**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

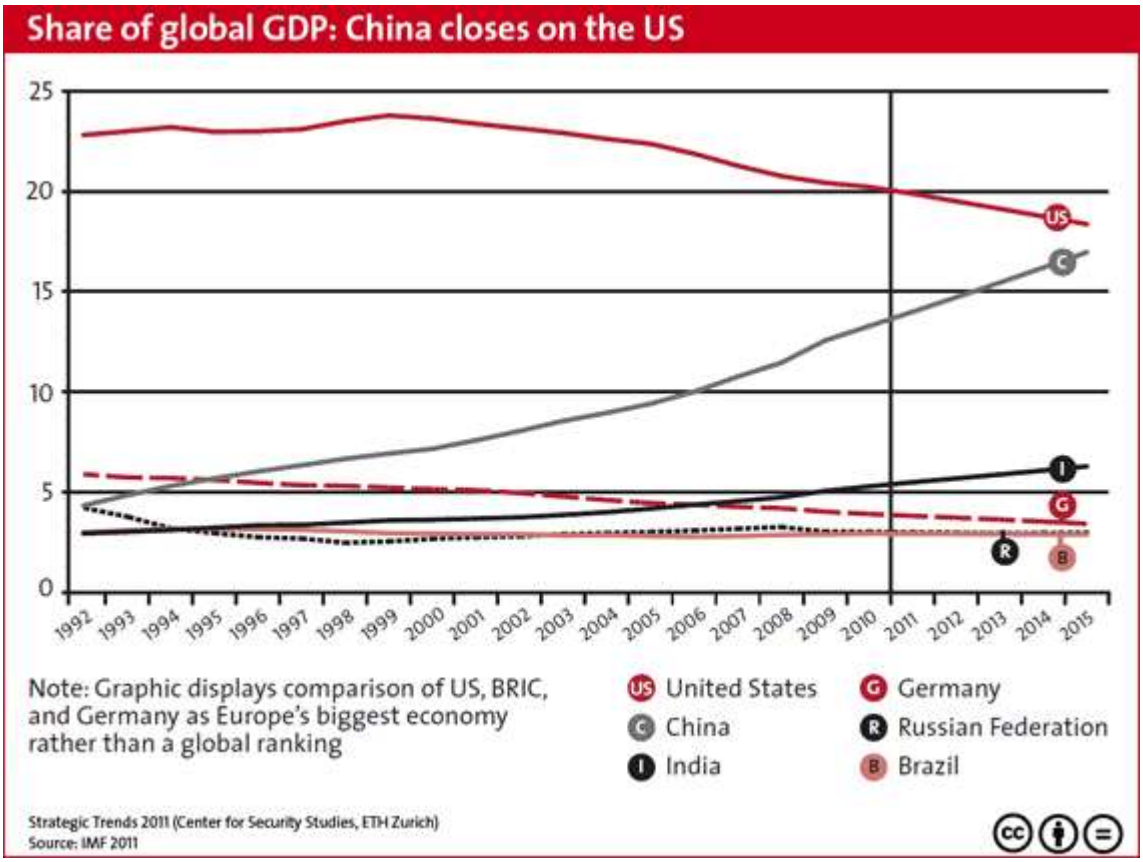
1. S. W. Townsend, C. Allen, M. B. Manser. **A simple test of vocal individual recognition in wild meerkats**. *Biology Letters*, 2011; DOI: 10.1098/rsbl.2011.0844

http://www.sciencedaily.com/releases/2011/10/111013085110.htm

The Reckoning Begins

By Michael Moran

| Posted Monday, Nov. 7, 2011, at 1:21 PM ET



America's insularity knows no bounds. This is a paradoxical statement, of course, but it's an apt way to describe America's current debate about "our future," and not a bad way to view Washington's strained efforts to grapple with an economy wounded by two decades of economic Puritanism. As grand as the rhetoric may be, politicians in the United States remain incapable of looking beyond the next election—this goes for the haughty Democrat in the White House and goes double for the Republican opposition. The fact is, airy-fairy optimism still sells on the campaign trail, particularly when the day-to-day reality of the average American is so difficult. Christian, agnostic, Jew, Muslim, or otherwise, we're a country of people constantly seeking redemption, and we're suckers for a smooth-talking messiah.

Not this time. At the risk of breaking the hearts that throb for Rick Perry, Mitt Romney or Barack Obama, they cannot deliver us from the future. Thanks to a catastrophic series of decisions by presidents of both parties that radically deregulated our financial system and arrogantly dismissed the "lessons of Vietnam" as dusty, irrelevant history, the United States has shortened the period during which it will remain the dominant power in the 21st century. I know, I know, all the presidential candidates say we're still the best! And so we

are, in almost every economic and military measure. But measurements of power are like the altimeter of an aircraft: It's not the altitude that matters, it's the trajectory, and by now most Americans finally understand that Captain America is trending downward.

Destiny is a big, pretentious concept. Yet today, most Americans understand what their politicians refuse to concede—at least publicly: We've lost control of our destiny. Globalization, the fairy dust proffered by everyone from Ronald Reagan to Bill Clinton to Thomas Friedman, turns out to have some significant downside risks. Many Americans have heard of globalization at this point, and many have very particular opinions of it—normally associated with negatives like offshoring, immigration or, perhaps, the complex risks of modern markets. But few really understand its implications. Thus the continued use by vacuous news networks of the term "nationally televised address," or the absurd assumption that our economic fate rests in our own hands. The world today—a world largely forged by American economic and foreign policy prejudices during the 20th century—now has profound influence on our future. Every word a president says in those Oval Office broadcasts these days resonates not just in the cozy "focus groups" in Iowa but also in the offices of the China Investment Corporation and sovereign wealth funds from Qatar to Japan to Russia who hold giant slices of our national debt. Like it or not, they have real leverage now, and evidence and history suggests they will eventually use it.

Contrary to what you have been told, the political game under way today ends not with control of the White House, a plan for a balanced federal budget, or a jobless rate suddenly hovering at a magical 8 rather than sour 9 percent. The larger picture—the new "Great Game," if you will—is about the speed of America's decline from the heights of hegemony to the more earthly altitude that 21st century gravity will impose.

This is not a matter of choice: Relative decline has already occurred—it depends on how you measure it. For instance, in terms of "percent of global output," the U.S. economy has been in relative decline ever since 1946, when it represented more than 50 percent of global GDP. Today, the U.S. is at about 20 percent, and projections suggest China will match that slide in about 2015.

But the more serious measurements—potential growth rates, GDP per capita, GDP itself, only turned south relative to other global competitors recently. It is only now, in the second decade of the post-American century, that these trends have penetrated the thick skull of the collective national consciousness. (Even now, some seem claim a magical power—manifest destiny? exceptionalism? prayer meetings?—will intervene and undo the laws of physics. More on this form of dementia as this blog matures.)

So, the situation is grim, but not hopeless. As I hope to convince you through this new blog and in my book of the same title (coming from Palgrave Macmillan in the spring), the relative decline America has entered requires something a good deal more complex than fiscal austerity. The U.S. will remain the world's most important nation well into this century—that's not a question. How we handle the implications of our relative decline—not only at home, but around the world where we have maintained the balance of power in region after region since 1945—will matter enormously. Unraveling our global commitments in a way that does not prompt a geopolitical "Lehman Bros." moment will be the true test of whether the United States was, as we like to believe, better than past hegemons.

Yet this requires the kind of planning America has shown no penchant for since at least the Marshall Plan of the late 1940s. More seriously, it requires a willingness to face up to the limits of American power that recent history simply belies.

Do I think it can be done? Yes, I do. But it will not flow from the top—and certainly not from the current crop of incremental thinkers who run both parties. Thankfully, the U.S. middle class—on the right and left—both seem to have reached a "boiling frog moment" with regard to promises being made on their behalf. The Tea Party and Occupy Wall Street may approach this from radically different perspectives—and indeed, they may

hate the idea that they have anything in common. But if there is one thing that unites them, it is the sense that their futures have been mortgaged away by an unaccountable, narrow-minded political class.

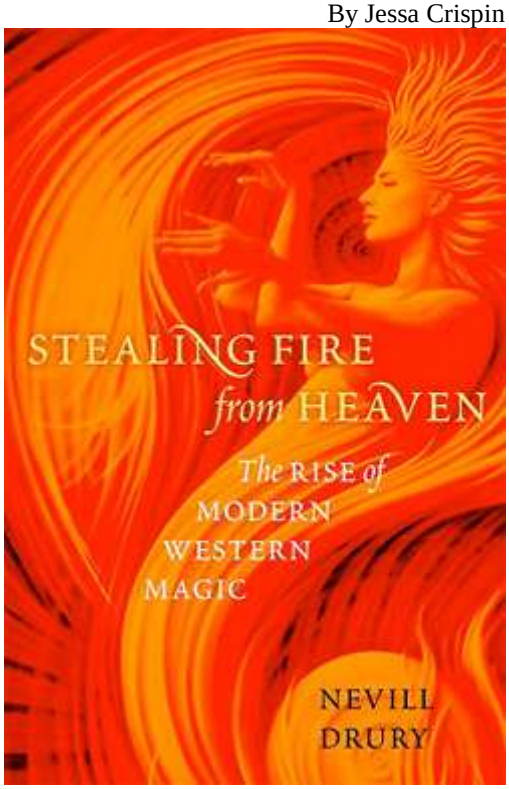
So who am I to offer prescriptions? I've been around—I won't bore you here—check out my bio on Wikipedia. In the coming weeks and months, through Eurozone paroxysms and fiscal blindness in Washington, primary debates, the Iraqi withdrawal, and other global events, I'll keep my eyes on the horizon. The American political cycle perpetually conspires to lower your sights, to narrow the context of all you see down to a Hollywood sounds stage that best favors a particular partisan point. Come here for the antidote, and when you think I'm failing, don't hold back. This is no time to pull punches: The Reckoning has begun.

http://www.slate.com/blogs/the_reckoning/2011/11/07/welcome_to_the_reckoning_a_blog_about_american_power_.html

I Have My Reasons

Arguments against magical beliefs always forget a very important point...

By Jessa Crispin



Some believe that Yeats got into the magical occult group the Golden Dawn because of his obsessive love for a woman. It happens, sometimes. Sometimes we take up hiking because our lovers appear to be half mountain goat, or we find ourselves suddenly fascinated by the work of Fritz Lang or have a burning new desire to see the Azores after a lifetime of not. Love opens up new avenues — or a new portal, as it may be. What else was Yeats to do when he suddenly fell in love with Maud Gonne, a woman who happened to sell her soul to the devil as a girl?

Yeats relays her story in his *Memoirs*:

She had sat one night over the fire thinking over her future life, and chance discovery of some book on magic among her father's books had made her believe that the devil, if she prayed to him, might help her. She asked the Devil to give her control of her own life and offered in return her soul. At that moment the clock struck 12, and she felt of a sudden that the prayer had been heard and answered. Within a fortnight her father died suddenly, and she was stricken with remorse.

I was having a conversation about Yeats and Gonne and their black magic dabbling. I was always more interested in Gonne. She was an Irish revolutionary and a writer, an occultist and a mother. She wore hats with birds' wings on them. Of the couple, she had most of the charisma, and her letters and memoirs have become a favorite topic of conversation for me. And yet, a man piped up during one of my rambles — the kind of man who makes sure you know he's an atheist within the first 30 seconds of meeting him — "I always get sad for Yeats for his occult beliefs."

- ***Blood and Mistletoe: The History of the Druids in Britain*** **by Ronald Hutton. 492 pages. Yale University Press.**
- ***Stealing Fire from Heaven: The Rise of Modern Western Magic*** **by Nevill Drury. 375 pages. Oxford University Press. $99.**

Well, I had to bite my tongue from exclaiming "The arrogance on you," and cock my head and leave the room. Had I been able to speak and still keep my temper (unlikely), I could have spent hours dissecting and refuting that one sentence. As if a man's belief system could be so easily plucked out of his life and his creative output would remain the equal. As if anyone has the right to be sad about the belief system that bolsters someone and feeds him. This would not be an argument about dogma. It's not about the evils religion justifies, from war to genital mutilation to telling followers they might as well leave their jobs and rack up some debt since the world is about to end anyway. The atheist versus faithful debate has become whether it is "sad" or weak or immoral for someone to believe in anything unprovable.

My anger wasn't born just from his attack on Yeats the person. Poets are poets. They're allowed a lot of leeway in the realms of wife-beating, drinking, sex, black magic, madness, poor political alliances, drug use, and violent behavior so long as they keep producing that work. It's just part of the poetic process, hanging out with fascists or whatnot. It's art, baby. You gotta do what you gotta do to keep the muses singing.

But the atheist's statement was not simply about the Nobel-winning poet. Had I retorted with the information that I have a wonderful relationship with my tarot card reader, with whom I have sessions every three months or so, or that I know the house placement and sign of Mars in my horoscope and that I have had entire conversations complaining about that placement and sign, or that I am a lapsed atheist who has strayed back into belief and my belief is actually very important to me, his sadness would have spread to all of humanity and our silly, superstitious ways.

Wasn't the Enlightenment supposed to wash the world of its sins of superstition and religion? And yet humanity keeps clinging to its belief systems, its religious leaders, and its prayer. More than that, we're dipping back into the magical realms — one would think that if superstition were to be eradicated through the power of reason and rationality, magic would be the first to go. It turns out our hunger for the irrational and the intuitive is more insatiable than previously assumed. We have our Kabbalah, our Chaos Magick, our Druids. We have our mystics and tarot card readers and our astrologers on morning news shows explaining why Kate and William are a match made by the gods. Wicca is a fast growing religion in the United States, and my German health insurance covers homeopathy and Reiki massage, both of which have always felt more like magic than science to me.

And yet the atheists keep on, telling us that we don't have to believe in God. It maybe never occurred to them that perhaps we want to. After all, when the 19th-century Spiritualism craze was revealed to be a bunch of hooey — a ragtag team of unusually flexible young girls and women rapping on tables and calling them messages from the spirit world, bending themselves into boxes to release "ectoplasm," setting off sound effects with their feet while still clutching the hands of others in the séance circle — we did not stop believing in ghosts and psychic phenomena. Even the great skeptic William James, who spent years of his career debunking these deceitful girls, put a proviso in his will asking his brother Henry to visit trusted mediums after his death, just in case he was able to get a message through.

Magical belief, whether that entails an omnipotent God who watches over us or the conviction that we can communicate with "the other side," fills a need in us. Some of us, I should say, as atheists would be quick to counter. How seriously we take that belief, and what we do with it varies from person to person. As the debates between the godless and the faithful continue — and these are so prevalent in our culture now, the religious figure versus the atheist, sponsored by every university and cultural center, that I read such a debate in a novel I had picked up — that perhaps these two kinds of people simply have a different set of needs. It's

like a new mother arguing with a woman who has never felt maternal a day in her life. Neither side will ever truly understand the longings of the other, and the fact that they can't stop arguing and trying to convince is proof of that.

So magical thinking seems completely inappropriate for our rational, post-Enlightenment world, and yet it's also completely in tune with our self-obsessed worldview. Because we can happily disregard millennia of Jewish teachings and just go for the wacky Kabbalah, because we like thinking we can transform the world and reality through will alone. We are in an age of the will, as Nevill Drury explains in *Stealing Fire from Heaven: The Rise of Modern Western Magic*:
Part of this thinking has to do with the core concept in spiritual humanism that each individual has deep within their being a divine potential, a sacred source of vitality. Nevertheless, there is only a single shift of emphasis between acknowledging that each human being has a sacred link with the spiritual universe as a whole, and identifying with that divinity from an egoic perspective by asserting: I have become the god.

Magical belief can be abused just as easily as religious. We had Nazis running around trying to find magical portals to tap into energy that will make them all-powerful. It's rumored that Putin has, as journalist Rachel Polonsky relays, "assigned money from the national budget to be spent on another search for the doorway to Shambhala in the Altai region of Siberia, a cosmic energy centre where he likes to pose for photographers, seated half-naked on a horse, like some latter-day Mongol kahn." These were men who obviously confused the I with the divine.

This current fad for magic and mysticism is just our current adaptation of our belief systems. We take the Kabbalah without the Torah because the traditional, orthodox Jewish faith is full of very uncomfortable things, like women as property, homosexuality as a sin, slavery as a-OK. These things don't mesh well with our current society, so we pick and choose because we still have this deep spiritual need. Likewise, in the day of the Golden Dawn, where Yeats and Gonne participated in a spiritual marriage that would never see a reality-based counterpart, men and women were finding a religious practice that allowed them to discard all the parts that didn't mesh. The Golden Dawn allowed female members to hold high positions of power, corresponding with the rise of first-wave feminism in the early 20th century, and repressive ideas about sexuality held over from the Victorian era could be eradicated with the idea that sexual activity actually produced magical energy. Their will may or may not have been done, but the ideas behind Freemasonry, the Golden Dawn, the splinter group established by the devilish Aleister Crowley, and the several other magical orders of the day were highly influential in shifting cultural mores.

All this magical thinking does sometimes tip into the willfully delusional. We have magical thinking about our magical thinking. Take the Druids. It conjures up an image of earthy wisdom, of long gray beards and natural magic, of learned philosophy and sacred stone altars. And modern folk, perhaps feeling a little cut off from the outside world in our modern, techno-culture, have started emulating the Druidic path, forming their own circles and practicing natural magic. They're the neo-Druids, and they dress in cloaks and put a cardboard horned moon on their head and learn which herb does what. Some of them call the gods and goddesses down into their bodies and then have mystical sex rituals, but from reading *Stealing Fire from Heaven*, I've determined that people are just always looking for excuses to do that, religious or no.

There are some problems with this. Besides the clothing choices. First, there is the fact that Druids maybe never existed. Calling the written record of the Druids' existence scant is maybe being generous. The clearest mention of the Druids was from Pliny the Elder, who reported their connection with the moon, with mistletoe, with a golden scythe. From that, we've extrapolated a lot, but let's just review Pliny the Elder's other recorded facts. He told us of the Blemmyis, a race of people with "no heads and whose eyes and mouths were in the center of their chests." Or the Cynamolgi, "who had dogs' heads." In India, there were men called the Astomi, "who lived only on perfume, inhaling nourishment through their nasal membranes." I guess that the fact that Pliny did not have the Druids fighting Griffins for their gold treasure (that would be the Arimapsi of Russia) or possessing only one leg with a giant foot (the Monocoli), makes people think he may have been telling the truth.

From there, a long line of manipulators and liars and thieves produced this idea of the Druid. Ronald Hutton's *Blood & Mistletoe: The History of the Druids in Britain* is a remarkable correction to the mythical idea that lives in our heads. Even if they did exist, and known fabricators like Julius Caesar and Pliny the Elder actually did talk to some guys who were calling themselves the Druids, there is no evidence of how they functioned, what their role was, whether they were human-sacrificing heathens or peaceful, wise practitioners of a natural religion. Everything they've been associated with — from the ogham alphabet based on trees to their poetic tradition — has been disproved. We confuse them with the bards a lot, a group of people who did actually exist. We credit the Druids with Stonehenge, because the only other explanation we seem to have is "maybe it was the same aliens who built the pyramids." And the men of the 19th century who claimed a direct lineage with the real Druids, their wisdom conveniently passed down only to Iolo Morganwg and other professional liars, had much to gain from people desperate for a religion that suited them better than the rigid Protestantism and Catholicism of the time.

Because they were such a blank, the idea of the Druid has warped and altered over the centuries. Hutton points out that they were as often used as a sort of bogey-man (that haunting last scene of *The Wicker Man* — the original version, at least — attests to that) as they were as a religious ideal.

They could be held up as exemplars of everything that a person happened to fear or hate in religion, whether paganism, rival forms of Christianity, or an over-powerful priesthood. They could be used as images of savagery, barbarism, ignorance and cruelty against which to celebrate the virtues of civilization and triumphs of progress.

That those negative images were as based in false information and wild imaginations shouldn't be surprising. The discovery of an Iron Age body, well preserved in the peat, led to fanciful speculation amongst those rational thinkers among us — the scientists — about what society in the time of the Druids was really like. The body was widely believed to be a human sacrifice, despite little to no evidence supporting this. The body was also instantly linked to the Druids because of mistletoe pollen found in the stomach — going back to Pliny's writings — despite the fact that the minuscule amount could have appeared from just breathing in on a high allergy alert day. And simply because much of this has been refuted and disproved and argued convincingly, that doesn't mean it's changed the minds of anyone who doesn't want their mind changed.

Informing neo-Druids of their falsified lineage is probably not going to do much to sway them, anymore than an advertisement on a bus proclaiming, "There's probably no God. Now stop worrying and enjoy your life" — like the recent campaign that ran on London buses — is not going to do much to sway me. I'll still be reading my Maud Gonne. In a time of great grief, having lost her son at the age of 1, right around the time Parnell died, she decided to use her will to fight against the current sad circumstances in her life. She began to research how she might reincarnate her dead son back onto the earthly plane. After a night of ritualistic sex on his grave (Yeats reports in his *Memoirs*, disapprovingly), a daughter was born nine months later. Maud was convinced that Iseult, as she named her daughter, contained the soul of her lost son. Those needs — for solace, for change, for order, for a little magic and irrationality — are not met with the ideals of the Enlightenment, and pretending those needs don't even exist is not the way to win converts. • *24 May 2011*

Jessa Crispin is editor and founder of Bookslut.com. She currently resides in Berlin, but spent many years in Chicago.

http://www.thesmartset.com/article/article05241102.aspx

The Geologist in the Jungle

One man's journey into the rainforest in search of a mysterious tree kangaroo.

By Matthew Power|Posted Monday, Nov. 7, 2011, at 12:18 AM ET

In July of 2011, John Lane, an explorer and geologist from California State University-Chico, mounted a biological research expedition to a remote wilderness region of New Britain, a volcanic island off the coast of Papua New Guinea. The greater PNG region is a hotspot of biodiversity, but one that is highly threatened by oil palm plantations and other industries. Lane's quest was to spur environmental conservation by finding a mysterious species of tree kangaroo, one of the rarest and most elusive mammals on earth, which natives had witnessed but scientists believed did not exist on New Britain. So with the help of local Nakanai tribesmen, several scientific researchers and a few Cal State students, Lane set up a base camp in a caldera deep in the forest, from which to conduct biological research and search for the creature. This following is adapted from Matthew Power's account of the expedition, Island of Secrets, *just published by* The Atavist. *The full ebook single is available for the Kindle and iPad/iPhone via* The Atavist *website*.

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 Typical expedition fare: Gume, a variety of jungle fern, sauteed with "bully beef," tinned corn beef.

Photograph by Dylan van Winkel.

Of course, expedition life had its deprivations. For weeks, meals had consisted of the limited possibilities afforded by ramen, rice, canned tuna, corned beef, and the occasional side of sautéed jungle ferns. We also consumed packets of Hiway Hardman brand biscuits, illustrated with a cartoon of a shirtless truck driver and the pidgin phrase “Strongpela tru!” that managed to be at once igneous and homoerotic. The tuna had a garish maroon cast to it, and the corned beef—the same “bully beef” eaten in the trenches of World War I—slid out of its tin in a coagulated cube of compressed trimmings. The joke around camp was that there were basically two options: cat food or dog food.

There were occasional variations in the meal plan. One afternoon, Mesak Mesori, a shirtless, bearded 55-year-old Nakanai hunter with six-pack abs and betel-red stumps of teeth, marched proudly into camp. He carried a long spear with a tip made of sharpened rebar and was followed by a parade of bois. (In Tok Pisin, the lingua franca of Papua New Guinea’s 800-plus languages, young men are referred to as “bois,” and girls are called “meris.”) They were shouldering a pole to which a large wild pig had been bound with vines. The pig had been caught in a leg snare—the wire had cut down to the bone by the time Mesak found it—and he had speared it in the lungs to dispatch it. The camp filled with the smell of burning hair as the bois held the carcass over the fire and then proceeded to butcher it with a machete. Mesak stood over them, gesturing and speaking in Nakanai, and the bois listened to him with respect and took the task seriously. Nothing was wasted, save the dark green gall bladder, which a boy plucked from the liver and tossed far into the forest. One of the bois told me that each part would be given to members of the village according to tribal tradition: the heart and liver to the elders, the eyeballs a delicacy reserved for women. Mesak had told Lane that this was why he had come out to help in his hunt for the tree kangaroo—he wanted the forest to be here for his grandchildren, and he wanted them to know its ways.

John Lane, the author, and Dylan van Winkel, on the hand-made raft used to cross the caldera lake to search for tree kangaroos in the Nakanai Mountains.

Photograph by Dylan van Winkel.

Lane was accompanied by three Cal State undergrads: Alan Rhoades, Emily Ramsey, and Heidi Rogers. I observed to Lane that a bunch of innocent Californian college kids in the middle of a jungle sounded like the archetypical setup of a 1970s exploitation horror movie. And it did seem as though an F/X crew was on the premises. One morning, Lane woke to find a 10-foot web strung between the same pair of trees as his hammock, an orb weaver spider the breadth of my palm splayed at its center. There were at least three species of scorpion in camp, and the native amethystine pythons were known to grow to 28 feet. Tiger leeches waited in ambush on the undersides of leaves, squirmed through the eyelets in hiking boots, and crawled their way to some out-of-the-way sites to feed undisturbed. A few days earlier, Lane thought he had a loose piece of skin on the inside of his cheek and discovered a leech feeding inside his mouth. Alan discovered the same while brushing his teeth. One morning, Sarah Wells, a British researcher working toward a Ph.D. in ornithology, had felt what she thought was a bit of dirt in her eye. She asked Heidi to take a look and was informed that a leech had attached itself to her eyeball, where it was happily engorged. As the camp gathered around to observe, Sarah maintained clinical detachment while Heidi attempted to pluck it off with tweezers.

The students, despite their physical afflictions, were lucky to have made it to New Britain at all. Their presence had apparently raised some red flags with the Chico State administration, which was not pleased at the idea of students heading off with an adjunct professor to crocodile-infested volcano territory. Perhaps they had read the State Department's extensive travel warnings. In any event, the morning of his departure flight, Lane was called in to meet with Chico State President Paul Zingg and the university's risk manager, who threatened to block the students from participating in the expedition. Chico State is an institution perhaps best known for being ranked America's No. 1 party school by *Playboy* in 1987, a title it held for 15 years. When the Office of Risk Management calls something into question, watch out. Lane informed them that Alan and Emily had purchased their tickets on their own and were already en route, laid over in Fiji, and the president ordered Lane to fly to Port Moresby, Papua New Guinea's crime-ridden capital, to rendezvous with the students and escort them directly back to Northern California.

The author in a dry stream bed deep in the rainforest of the Nakanai Mountains.

Photograph by Dylan van Winkel.

After planning dozens of previous expeditions full of ego clashes and unpleasant surprises, Lane had developed various coping strategies. This, in part, explained his deadpan affect and seeming inability to get worked up over almost anything. He received the Chico State president's direct order not to bring the students along with stubborn unflappability. "If you let that stuff get to you, you end up with a nine-to-five as a pencil pusher, stuck in traffic," Lane told me. There was something in his tone that implied such a fate was the one defeat he really feared. So Lane had simply ignored Zingg's request and met up with the students in Port Moresby to begin the expedition. And now here they were, deep in the New Britain jungle, far beyond the reach of any administrative consequence, ready to fan out in search of Lane's elusive quarry.

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Dylan van Winkel, a 25-year-old South African herpetologist who had joined the expedition, told me at one point that tree kangaroos give off a strong, musky odor, so I inhaled deeply, hoping for a whiff. Instead, I smelled rotting vegetable matter and my own sweat. I searched the canopy overhead for a glint of chestnut fur among the mossy branches. Almost immediately it began to rain, pounding down so hard that it was like being held beneath an open hydrant, the roar so loud we could barely hear one another. We didn't even bother with raincoats, which would only drench us from the inside with the humidity. The jungle was filled with mutant versions of flora more familiar as houseplants and garden flowers: 10-foot ferns, head-high begonias, and fluorescent-pink impatiens erupting from the rotting crevices of trees. Rattan, that Pier 1 standby, was here a flesh-tearing horror, with stems covered in three-inch spikes and cat-claw thorns lining the undersides of its fronds. My clothes were soon shredded and my forearms bloody with deep scratches.

A captive tree kangaroo in the town of Kimbe, New Britain. This specimen was brought over from the Papua New Guinea mainland, and is similar to the species of tree kangaroo the team was looking for in the wild.

Photograph by Dylan van Winkel.

Dylan stopped frequently to roll over rotten logs, each one like a lottery scratch-off whose jackpot was yet unnamed species of spiders, beetles, and frogs. At one point, he squatted and poked at something on the ground with the machete, a slimy heap of half-digested seedpods. "Cassowary shit," he said. We all took pictures. Five feet tall and weighing perhaps 60 pounds, the Bennett's Cassowary is one of the more dangerous creatures in the forest. It resembles a flightless steroidal turkey, with a royal blue neck streaked with red, a mound of shaggy black feathers, and dagger-like spurs on thick legs. The birds can be territorial and attack humans, leaping and punching with their spurs or head-butting with an ax-like crest of bone atop their skulls. "He can jump up to a meter in the air, and he'll go for your throat, your stomach, or your groin," Lane casually observed. He had been charged by one, of course. From a scientific perspective, of course, stomping through inaccessible rainforest and looking around at random trees is hardly a methodologically sound way of finding a tree kangaroo. Some of the best research on tree kangaroos in the wild has been done by Lisa Dabek, director of the Tree Kangaroo Conservation Program at the Woodland Park Zoo in Seattle. Dabek used native hunters with tracking dogs to locate the animals, then sent climbers up into the branches after them, until, to escape, the tree kangaroos leaped to the ground, where they were promptly tackled, radio-collared, and released. There are few other ways to make long-term observations. But Dabek's research and dedication have achieved real results; she persuaded local landowners to create an 180,000-acre conservation area around the heart of the tree kangaroo's habitat on the mainland's Huon peninsula. It took Dabek 10 years, and extraordinary cooperation by the native communities, to establish the protections.That is exactly what Lane would have to do—a long process of diplomacy and trust-building with the local tribes—but it was unclear whether he had the patience for that. Lane was aware of this, of course, but rigorous methodology and slow diplomacy were not his preferred M.O. My own feelings wavered between resentment at having come halfway around the world on a half-assed goose chase and a sense of wonder that we were searching for something rich and strange at the far end of the earth. But there I was, and there was nothing much to do but follow Lane deeper into the jungle of the Nakanai. He was out there trying for the big win, the Hail Mary that would save New Britain with one grand and miraculous discovery.

Find the rest of Matthew Power's Island of Secrets *at The Atavist.*

http://www.slate.com/articles/health_and_science/science/2011/11/island_of_secrets_in_search_of_a_tree_kangaroo_on_new_britain.single.html

Patterns of New DNA Letter in Brain Suggest Distinct Function

In 2009, the DNA alphabet expanded. Scientists discovered that an extra letter or "sixth nucleotide" was surprisingly abundant in DNA from stem cells and brain cells. (Credit: iStockphoto/Mads Abildgaard)

ScienceDaily (Oct. 30, 2011) — In 2009, the DNA alphabet expanded. Scientists discovered that an extra letter or "sixth nucleotide" was surprisingly abundant in DNA from stem cells and brain cells.

Now, researchers at Emory University School of Medicine have mapped the patterns formed by that letter in the brains of mice, observing how its pattern of distribution in the genome changes during development and aging.

Those patterns, stable or dynamic depending on the gene, suggest that 5-hydroxymethylcytosine (5-hmC) has its own distinct functions, which still need to be fully brought to light.

"Our data tells us that 5-hmC is not just an intermediate state," says senior author Peng Jin, PhD, associate professor of human genetics at Emory University School of Medicine. "It looks like it has specific functions in stem cells and brain. 5-hmC may poise a gene to be turned on after being repressed."

The results were published online Oct. 30 by the journal *Nature Neuroscience*. The paper is the first report on how the patterns of 5-hmC's distribution change in mouse brain during development, and also contains data on 5-hmC in DNA samples from human brain.

Postdoctoral fellow Keith Szulwach and instructor Xuekun Li are co-first authors, and collaborators from the University of Chicago and the University of Wisconsin-Madison contributed to the paper.

5-hydroxymethylcytosine (5-hmC) is an epigenetic modification of cytosine, one of the four bases or "letters" making up DNA. Epigenetic modifications are changes in the way genes are turned on or off, but are not part of the underlying DNA sequence. 5-hmC resembles 5-methylcytosine (5-mC), another modified DNA base that scientists have been studying for decades. Until recently, chemical techniques did not allow scientists to tell the difference between them.

In contrast to 5-mC, 5-hmC appears to be enriched on active genes, especially in brain cells. 5-mC is generally found on genes that are turned off or on repetitive "junk" regions of the genome. When stem cells change into the cells that make up blood, muscle or brain, 5-mC helps shut off genes that aren't supposed to be turned on. Changes in 5-mC's distribution also underpin a healthy cell's transformation into a cancer cell.

It looks like 5-hmC can only appear on DNA where 5-mC already was present. This could be a clue that 5-hmC could be a transitory sign that the cell is going to remove a 5-mC mark. Jin says the patterns his team sees tell a different story, at least for some genes. On those genes, the level of 5-hmC is stably maintained and increases with age.

The Emory team used a method for chemically labeling 5-hmC they developed in cooperation with scientists at the University of Chicago. They find that 5-hmC is ten times more abundant in brain than in stem cells, and it is found more in the body of some genes, compared to stem cells.

In addition, the researchers found a relative lack of 5-hmC on X chromosomes in both males and females. That result is a surprise, Jin says, because it was already known that the X chromosome is subject to a special form of regulation in females only. Males have one X chromosome and females have two, and in female cells one of the X chromosomes is inactivated.

Jin's team is beginning to map how 5-hmC changes in neurological disorders, including Rett syndrome and autism, and refining techniques for detecting 5-hmC in DNA at high resolution.

The research was supported by the National Institutes of Health, the Simons Foundation and the Emory Genetics Discovery Initiative.

Story Source:

The above story is reprinted from materials provided by **Emory University**.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

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"Flea Circus"

By Tomás Q. Morin|Posted Tuesday, Nov. 8, 2011, at 7:10 AM ET

When civilization ended a few rejoiced
because it meant losing
the horror of butchering
the last animal for the last
supper of meat. The next time
everything collapsed,

I joined the circus and slept on straw,
read Tolstoy
to the snoring zebras, lectured them
on the holiness
of the haunch, on the hideousness
of tears. Tonight,

I am the star grinning in the center
of the ring, waiting
for the gasp of the first housewife
to see the well-groomed
mat of hair on my back
that will remind her

of the dogs she loved, the ones
she could no longer feed
or bring herself to eat. The lights dim
and I wait on all fours
for the music to cue the girl in sequins
whose job is to pour

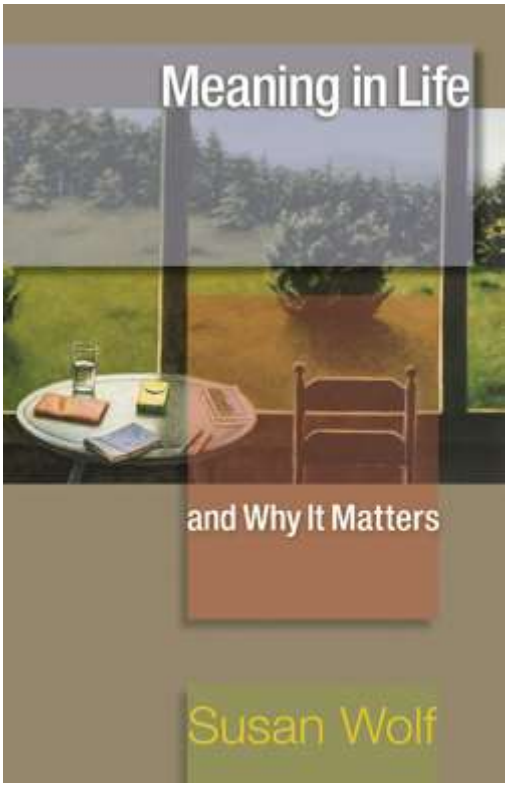
along my back the bucket of gymnasts
and high-wire acts
to make me dance and join the chorus
with my baritone
until the crowd rises to its feet and laughs
the stale, heartsick night away.

*For **Slate**'s poetry submission guidelines, click here. Click here to visit Robert Pinsky's Favorite Poem Project site. Click here for an archive of discussions about poems with Robert Pinsky in "the Fray," **Slate**'s reader forum.*

http://www.slate.com/articles/arts/poem/2011/11/_flea_circus_by_tom_s_q_morin.html

Always Searching
Some find their meaning, others squander any hope for it. I want to be the former.

By Jessa Crispin



There have been Sundays, in bed, in a hotel room, hungover or not, wherein my prospects for getting out of bed seem slim, what with the television right there, and the remote control so near my head. Despite hundreds of channels and the free HBO — generally just showing something directed by Ron Howard over and over and over again — I will stop on Joel Osteen or Rick Warren or some other reprehensible creature in a mega church of some sort. On those Sundays, it's hard to feel the repulsion I usually have for such views. It's the perfect hair and the shiny, shiny teeth. These men are always telling me that God has plans for me. "Oh, Joel Osteen," I say out loud to the television. "Tell me what those plans are."

- ***Meaning in Life and Why It Matters*** **by Susan Wolf. 160 pages. Princeton University Press. $24.95.**
- ***The Silences of Hammerstein*** **by Hans Magnus Enzensberger. 402 pages. Seagull Books. $29.**

He never says. There is big talk about giving yourself over to something bigger than yourself, contributing, community, whatever. He is sympathetic to my longings, but won't tell me what God wants me to do. Something bigger than myself could mean, I guess, saving elephants from poachers or protesting an abortion clinic. Be specific! Bastard, I think. Whatever it is that God wants, I'm sure it probably involves putting on pants and getting out of bed, and so I consider it. But if I stay long enough, listening, Osteen will tell me that as a woman, my family is bigger than myself, and raising children and being a helpmeet to my husband counts. "I tried that!" I tell him. Well, not really. Sort of. It was discussed. There was a boy I considered

marrying 10 years ago, who said I would not have to work. He would Provide. It wasn't his fault that the word "provide" makes me break into hives and move to another city. With all of Osteen's talk about wives nurturing and men Providing, I start to wonder if he has heard of Ruth von Mayenburg. For some reason, I doubt it.

In her memoir *Blue Blood and Red Flag*, Mayenburg recounts an evening in 1930 in Germany, as she was readying herself to hitch her life to a respectable, rich young man. Named Axel (this was Germany, after all). But as she was dressing for dinner, a man knocked on her door.

It was my neighbor from the next room, Kurt Baron von Hammerstein-Equord, General and Chief of Army Command... He immediately went to the heart of the matter: he would think it a misfortune if Axel and I were to marry. He liked the lad, felt somehow partly responsible for his further fate; I was not the right woman for him. I should think the matter over carefully and also consider that I myself would not be happy in such a tradition-conscious German-national atmosphere. "You are much too headstrong. A lively, impetuous spirit."

Sometimes you just need it spoken out loud, to hear it from another source to realize how true it is. Marriage in 1930 Germany would have destroyed Mayenburg. An endless life of baby-making and dinner hosting and not asking questions. Mayenburg did not simply not marry Axel. She became a major for the Red Army, engaging in espionage in Berlin during the war and feeding the information back to Russia. In *The Silences of Hammerstein*, Hans Magnus Enzensberger describes her life as full of "the best hotels, the champagne breakfast, the sleeping cars, the hunting parties, the casinos, the good addresses in Berlin's west end, the elegant yellow spring costume in your suitcase..." Who knows how one manages to go from being on the verge of marrying a man named Axel to wearing a signet ring "with the cyanide capsule under the gold lid." Joel Osteen sure doesn't.

I gravitate to books with titles like *Meaning in Life*, the latest being Susan Wolf's. These books are mostly nice antidotes to those insufferableables who once dabbled in Wicca and now really love Rumi and tell college graduates to "Follow Your Bliss!" (look, they hand silk-screened it onto a handy little t-shirt so you won't forget!). Wolf thinks following your bliss is useless. People are passionate about a lot of stupid things. It's not a great mantra. Meaning, I think, comes from doing a full accounting of your limitations and assets, your passions and your weaknesses, your belief system and your fears, and then rubbing up against the things that cause you to panic, like an allergy skin scratch test, and find out what your reactions are. Once you figure out how you can contribute to the greater good, once you're able even to define that, you take that information and pour yourself into one direction. Regardless of discomfort or regrets or what-ifs. (And then doing that over and over again, until death.) That does not fit on a T-shirt. That to me is more important than bliss, which would really just lead me back into bed, maybe with a bowl of corn flakes, or maybe I would become like an elderly widower, and just Wait for Death. Or become Alice James.

There is no historical figure who fills me with as much frustration as does Alice James. Whiny, petulant, bratty, arrogant, useless Alice James. And yet I cannot stop reading about her. She is one of those figures Susan Wolf refers to, the people who have no meaning of their own, and are only given meaning by outsiders. Her taking-to-her-bed for her entire life, feigning illness, suffering from illness, and bringing illness upon herself has become a metaphor, an example of lost potential, a feminist symbol. And yet I hate her and I want to pull her hair. She squandered so much. She had the love of two devoted brothers of means who doted on her and took her to Paris and offered to support her. Yet she rejected them. She started to recover her ill health when she gained a teaching position, and yet she quit and went back to her bed. Her illnesses were cleverly timed to go off whenever anyone stopped paying attention to her. Or when she discovered that work is hard.

What makes her life so meaningless — rather than just typically sad and sick — is the willfulness of her disease, and the great talent of her writing. She had a sharp wit — a letter of hers is quoted in *Becoming William James*, in reference to her face, "My features I have long since ceased to question as the work of an inscrutable wisdom." In a letter she describes a man as sitting "on the edge of the sofa tight and compact, like a neat little parcel drawn up at Metcalfs." With her gimlet eye, sense of humor, and fearlessness, you can imagine her rewriting her brother Henry James' books with a bluestocking sensibility. Your heart cries out for

those lost novels. Mostly her gift is spent writing bitchy things about other women, like her reasons why she considers herself vastly superior to George Eliot. She was suicidal from puberty on, never learning the lessons of her brothers William and Henry, or what Wolf sums up as, "What gives meaning to our lives gives us reasons to live, even when we do not care much, for our own sakes, whether we live or die." And now that is the meaning her life carries: how meaninglessness is so easy to fall into, and how no one is going to drop a meaningful life into your lap. You fight for it over and over again.

Mostly the reason I hate her is because a big chunk of her lives inside of me. I wonder if someone had allowed me to take to my bed the way they did Alice — she was, after all, not turned out to the street by frustrated parents, instead they pitied her and sent for an endless stream of doctors — or had I married the Provider, would I have fallen into the same trap? Or would I have, on the eve of my wedding, turned into Ruth von Mayenburg, defected to Russia and traveled the world with micro-cameras hidden in my hair? It's hard to say exactly, but on these horrible Sunday mornings I do eventually make it out of bed, into the shower, and back into the world. Almost always. • *20 May 2010*

Jessa Crispin is editor and founder of Bookslut.com. She currently resides in Berlin, but spent many years in Chicago.

http://www.thesmartset.com/article/article05201001.aspx

Beards, Theft, and Other Peculiar Factors That Turn Images Into Icons

A new book traces how images become universally recognized icons.

By Elizabeth Weingarten|Posted Tuesday, Nov. 8, 2011, at 10:12 AM ET

Jesus Christ was originally depicted without a beard. The heart symbol didn't get its two round lobes until the 1400s, and the Coca-Cola bottle hasn't changed in almost a century.

These are just a few of the interesting facts that Oxford University professor Martin Kemp encountered in the process of researching his latest project, *Christ to Coke: How Image Becomes Icon*. The book, which will be released Nov. 10, examines the stories behind the most famous pictures in the world.

"Where does the notion of an iconic image come from?" is the driving question behind this work. To find out, Kemp chose 11 of the world's most recognizable images in areas as distinct as biology and product design. The slide show above reveals his 11 picks, and a few of the most interesting factors that propelled their rise from obscurity to fame.

http://www.slate.com/articles/arts/gallery/2011/11/images_from_martin_kemp_s_book_christ_to_coke_how_does_an_image_become_an_icon_.html

THE BOLD AND THE BEAUTIFUL

Andrea Arnold's "Wuthering Heights" and Cary Fukunaga's "Jane Eyre" take radically different approaches to classic material ...

From THE ECONOMIST online

This autumn sees two new film adaptations of novels by the Brontë sisters: one, directed by Andrea Arnold, of Emily Brontë's "Wuthering Heights", and the other of Charlotte Brontë's "Jane Eyre", directed by Cary Fukunaga. Making a film adaptation of a classic novel is an ambitious and risky business—both of these books have been read, studied, loved and debated for over 150 years. The destructive passion of Catherine and Heathcliff and the stoic, enduring love of Jane and Rochester have seeped into the common consciousness.

There are already several film adaptations of both novels, such as Robert Stevenson's gothic 1943 interpretation of "Jane Eyre" and Robert Fuest's unconventional 1970 take on "Wuthering Heights". So why make any more? The preoccupations of Victorian ladies, such as status, marriage and inheritance, aren't as potent as they once were. Yet the darker forces of these books, including their undertones of feminism and concerns with inequities and feelings of alienation, are as relevant as ever.

The two films take different approaches to the classic material. Often described as "gritty", Ms Arnold made her name as a director of films such as "Red Road" and "Fish Tank". With "Wuthering Heights" she has created a feature that feels wild, brutal and brave. She boldly cast a black Heathcliff (Solomon Glave as the boy, James Howson as the man), which runs a thread of racism through the story. When Mr Earnshaw adopts Heathcliff and brings him to his remote farmhouse on the Yorkshire moors, his own son is repulsed by this dark-skinned intruder. Rather than welcoming him as a brother and an equal, he beats him and works him as a slave. Mr Earnshaw's daughter, however, is intrigued by Heathcliff—his exotic blackness adds to the allure. Shannon Beer plays the young Catherine with a perfect mix of primal instinct and girlish curiosity. The bulk of Ms Arnold's film is seen through the young Heathcliff's eyes, alternating between abusive farm work and blissful escapes across the moors with Catherine (who matures into Kaya Scodelario). Among the other-worldliness of the rolling hills, their love appears entirely natural. But real-world prejudices mean that they can never be together.

The cinematography makes a star of nature; the moors feel almost tangible. The camera bristles through the heather as Catherine and Heathcliff roam the hills. Striking stills of the vast, unforgiving landscape contrast with intense close-ups of Catherine fingering a feather, or Heathcliff snapping a rabbit's neck. This is visceral stuff, not a polished dramatisation. There is no musical score, just natural sound effects: the gushing rain, the howling wind. When Heathcliff is whipped as punishment, there is just the raw sound of leather on flesh. Ms Arnold's interpretation of "Wuthering Heights" lacks the romance that some may anticipate, but it has a rugged beauty and packs a punch.

Cary Fukunaga's "Jane Eyre" is a more conventional period adaptation. The characters are neatly presented in Victorian dress, politely interacting in the grand Thornfield Hall; the action is corseted in 19th-century etiquette. This doesn't seem like a natural choice for a director known for more niche projects, such as "Sin Nombre", a violent thriller about illegal immigrants travelling from Central America to the United States. But it seems Mr Fukunaga can turn his hand to something more traditional too.

Orphaned at birth, Jane (played by Mia Wasikowska) had a miserable childhood; she arrives at Thornfield Hall to be a governess to young Adele, a ward of Rochester (Michael Fassbender). The couple are not an obvious match—the plain employee and the arrogant master—but their attraction is a meeting of minds. In one memorable scene Rochester, in a typically condescending tone, asks Jane for her "story of woe", as every governess has one. But despite her harrowing beginnings Jane rebuffs him—she has no story of woe, and does not require his sympathy. Rochester is surprised but also seduced by her confidence. Jane is animated by his passion. These roles are inhabited in quite muted fashion by Ms Wasikowska and Mr Fassbender—who recently won best actor at the Venice Film Festival for his raw performance in Steve McQueen's "Shame". But once again it is Judi Dench who steals the film as Mrs Fairfax, the diligent housekeeper, with a repertoire of shrewd looks and sharply comic one-liners.

This is a beautiful film in which all the elements chime together. Well-curated shots of the household provide an omniscient view of the action. These make the moments of Jane eavesdropping outside a door by candlelight, or of Rochester contemplating his demons, all the more claustrophobic. Outside in the manicured garden, the sun flickers as emotive strings mirror Ms Wasikowka's reverie. The film never quite reaches the tempestuous highs of the novel, but by choosing to tone down the drama Mr Fukunaga has played it safe. He has made a film that will endure; it's a suitable and subtle tribute to a classic book.

*"**Jane Eyre**" is in cinemas in Britain and elsewhere in Europe. "**Wuthering Heights**" will be in cinemas in Britain from November 11th.*

http://moreintelligentlife.com/content/arts/bold-and-beautiful

Khan Academy Gets $5 Million to Expand Faculty & Platform & to Build a Physical School

by Audrey Watters on 04. Nov, 2011 in News

Khan Academy announced this morning that it has raised $5 million from the O'Sullivan Foundation (a foundation created by Irish engineer and investor Sean O'Sullivan). The money is earmarked for several initiatives: expanding the Khan Academy faculty, creating a content management system so that others can use the program's learning analytics system, and building an actual brick-and-mortar school, beginning with a summer camp program.

The $5 million marks the latest in funding for the non-profit, which has received over $2 million in grants from the Gates Foundation and from Google.

Part of the lure of the Sal Khan narrative is this idea that he is single-handedly educating the world through his self-made YouTube videos. No doubt, you can point to page and video views to make a case about his impact.

Khan has long kept full control over the "instruction", or rather the video creation — all the content has been created by him. That changed last month, as I reported here, when Khan Academy struck a partnership with SmartHistory, bringing on that organization's Dr. Beth Harris and Dr. Steven Zucker as art history instructors. The money from the O'Sullivan Foundation will be used in part to expand the Khan Academy further, to at least 5 full-time-equivalent teachers.

The O'Sullivan Foundation grant will also be used to build what's described as "a crowd-sourced content management and curation system." Details are sketchy on exactly what this entails, but the press release compares it to Wikipedia, saying it's a "similar outlet for dedicated professionals to develop quality instructional content." The system will also enable others to tap into some of the tools and analytics that Khan Academy is developing.

Khan Academy intern David Hu offered some great insight this week into what these analytics look like. In a blog post entitled, "How Khan Academy Is Using Machine Learning to Assess Student Mastery," Hu detailed the efforts underway at Khan Academy to rethink how its model for student proficiency works. Currently, it

relies on a "streak" — that is, students must get a certain number of questions right in a row in order to move on. Hu proposes an alternate approach to ascertaining whether or not a student has gained proficiency (defined as a 94% or greater likelihood of correctly answering the next question asked involving that skill) using a logical regression model. Hu hypothesizes that with this new proficiency model, learning outcomes should increase, in part by moving students off of problems that they're good at more quickly.

With its current level of funding, no doubt Khan Academy has been able to attract some real super-star engineering talent to its team — a team that has remained fairly small. There are, I think, under 20 employees, including the recent SmartHistory additions. But it's worth noting that while the engineering brainpower is sizable here, the number of teachers (past or present) on board is small.

"Teachers don't scale," I remember Sal Khan saying to me when I interviewed him last year. What can scale, he argues, is the infrastructure for content delivery. And that means you just need a handful of good lecturers' record their lessons; the Internet will take care of the rest.

But online instruction clearly isn't enough, and as "blended learning" becomes the latest buzzword — that is, a blend of offline and computer-mediated/online instruction — Khan Academy is now eyeing building its own school. The money from the O'Sullivan Foundation will go towards developing a "testbed for physical programs and K-12 curricula," including an actual physical Khan Academy school. This will begin in June 2012 as a series of summer camps.

"The school of the future will not resemble the school of today," Khan says. "In the past, the assembly-line, lecture-homework-exam model existed because that's what was possible in the no-tech and low-tech classrooms of their day." His team now have $5 million to take that lecture-homework-exam model into the high-tech classroom… or something.

http://www.hackeducation.com/2011/11/04/khan-academy-gets-5-million-to-expand-faculty-platform-to-build-a-physical-school/

ENGLISHMAN IN NEW YORK

A new exhibition about Cecil Beaton's career in America brings his singular sensibility into sharp focus, says John McIntyre ...

Special to MORE INTELLIGENT LIFE

Cecil Beaton, an English photographer, found happy hunting in New York City for more than 40 years, both behind the camera and in the world of the theatre. When he arrived in America after the second world war, Beaton wrote that it was "time to settle down and relish to the full the infinite delights that New York has to offer." A new exhibition at the Museum of the City of New York aims to chronicle his engagement with those delights, from his early *Vogue* photos of the mid-1930s—their figures highly stylised in poses and shadows reminiscent of German Expressionism—to a 1970 portrait of Mick Jagger, as casual and unaffected as a snapshot.

Over the course of his career, Beaton photographed everyone from the English royal family to socialites to film icons, such as Marilyn Monroe and Marlene Dietrich (pictured). One remarkable portrait from 1948 shows a very young Marlon Brando, straddling a chair and holding an open book. He looks into the camera with the contempt and beauty of a schoolboy who knows he can get away with anything. Such distinguished characters gave Beaton exceptional source material, but these photographs reveal that he was more than the sum of his subjects.

He lived in a style worthy of those he photographed, in suites of rooms at fine hotels, the Plaza and the Sherry-Netherland, among others. These rooms are featured in the show, shot in rich colour. Beaton decorated

the rooms as a way to illustrate his flair for interior décor, but at least in the case of the Plaza, he stayed at a greatly reduced rate, thanks to the largess of his friend Serge Obolensky, who ran the hotel at the time.

It was from the Plaza that he wooed the infamously reclusive Greta Garbo, one of the few women Beaton, who was gay, pursued in a romantic fashion. He photographed her in those same rooms, unforgettable images which ran in a 1946 issue of *Vogue*. A pair of particularly memorable shots from that sitting is included in the exhibition. One features Garbo lying on the floor with her knees drawn up to her chest, her lips parted in a smile. Another sees her standing next to a window, her expression reflective and composed. “Sometimes photographs are more like people than they are themselves,” Beaton observed after an outing with the actress. His portraits of her capture some essential aspect of her character. They are rare unguarded moments in the life of a very private individual.

But the exhibition ranges far beyond Beaton’s familiar pictures. An array of sketches and photos is devoted to each of several key figures in Beaton’s American life, beginning with Elsie de Wolfe, an early mentor, all the way through Diana Vreeland, who championed Beaton’s work during her time as editor at *Harper’s Bazaar* and then *Vogue*. An unexpected highlight is Beaton’s work designing sets and costumes for the theatre. A dark and otherworldly sketch for the 1951 New York Ballet staging of Swan Lake is particularly striking, and costumes he designed for productions of “Turandot” and “La Traviata” are displayed to fine effect.

The sum of these images and items is the sense of Beaton as a singular talent, a prolific artist with a sensibility all his own. And though that sensibility can seem overly mannered at times, the product of another era, Beaton recognised very early the primacy of fame in American life. He understood the public's desire to see the figures they so adored in all weathers and lights, in roles other than those that made them famous. Like any good portraitist, he knew the value of artifice in presenting his subjects, and that flattering images would guarantee continued access. For that, he remains relevant today and should for years to come.

Cecil Beaton: The New York Years *is at the Museum of the City of New York until February 20th. A companion book was edited by Donald Albrechy and features an essay by Susan Henshaw Jones. It is available from Skira Rizzoli Books.*

John McIntyre *is the editor of "Memorable Days: The Selected Letters of James Salter and Robert Phelps" (Counterpoint Press). He lives in Newark, New Jersey.*

http://moreintelligentlife.com/content/arts/beauty-far-home

Are Front-Page Editorials on the Rise?

By David Haglund

| Posted Tuesday, Nov. 8, 2011, at 3:19 PM ET

The Patriot-News

Tuesday, November 8, 2011

A PATRIOT-NEWS EDITORIAL

THERE ARE THE OBLIGATIONS WE ALL HAVE TO UPHOLD THE LAW. THERE ARE THEN THE OBLIGATIONS WE ALL HAVE TO DO WHAT IS RIGHT.

Today, *The Patriot-News* in Harrisburg, Penn., published a front-page editorial arguing that, on account of the sexual abuse scandal that has recently come to light, Penn State president Graham Spanier must "step aside." Penn State football coach Joe Paterno, the editorial said, should be allowed to finish this season, but his contract should not be renewed. (Paterno may be out of a job sooner than that.)

Running an editorial on the front page is a rare practice in the United States. (It is more common in some other countries, including Italy and France.) "At most large papers, the top news editor and the editorial page editor are peers, each reporting only to the publisher," says Robert Turner, a professor of journalism at Northeastern and one-time deputy editor of the *Boston Globe*'s editorial page. (Turner is also the father of Julia Turner, ***Slate***'s deputy editor.) So the decision to run an editorial on the front page will come from the publisher, "possibly over the objections of the news editor."

What's more, Turner says, American newspapers are generally wary of "confusing the reader by mixing fact and opinion." By placing editorial opinion right next to its most prominent news coverage, a newspaper risks raising questions about its objectivity.

Are American newspapers doing this more than they used to?

Quite possibly. Bruce Dold, editorial page editor of *The Chicago Tribune*, says they are "running more editorials on the front page" than they once did. When the editors "think an issue or a position demands maximum impact," Dold says, "we'll put the editorial out front." "Usually," Dold added, "the editorials run on the top of [page one] and they're clearly labeled as editorials so readers will not confuse them with news coverage."

Dold's comments are in line with what Michelle Weldon, an assistant professor at Northwestern's Medill School of Journalism, found when she studied the front pages of 20 major American newspapers in the first few years of the last decade for her book *Everyman News: The Changing American Front Page* (2007). Weldon discovered that the number of front-page pieces that openly included opinion or analysis increased sharply between 2001 and 2004. Reached on the phone, she said that newspapers feel the need to include "a deeper analysis" on their front pages because it's now possible to "get the news in real time in so many other ways."

Weldon noted that today's editorial in *The Patriot-News* was especially unusual because it consumed the entire front page, which she found "a little astounding." Still, she said, *The Patriot-News* may have felt they "had no choice," because the scandal is such massive local news. In general, local newspapers are more likely to run front-page editorials than national newspapers, and usually on matters of local concern.

Last week, for instance, *The New York Post* ran a front-page editorial demanding Mayor Michael Bloomberg evict Occupy Wall Street from Zucotti Park. Earlier this year, *The Salt Lake Tribune* ran its first front-page editorials in eight years, both concerning Utah state legislation that would deny citizens access to public records. *The Manchester Union-Leader* sometimes endorses candidates for New Hampshire's "first in the nation" primary on the front page. (Although, as Robert Turner points out, this has become less common under current *Union-Leader* publisher Joseph W. McQuaid than it was under Bill Loeb, a famously outspoken publisher.)

Weldon notes that newspapers seem more likely to run editorials on the front page when editors are confident their opinions will be shared by most readers. In the case of the Penn State sex abuse scandal, the *Harrisburg Patriot-News* certainly didn't need to worry that its outrage would fall on deaf ears

http://www.slate.com/blogs/browbeat/2011/11/08/front_page_editorials_on_the_rise.html

A VISION OF THE FUTURE

Walid Siti explores his native Iraq with intimate and ghostly art at the Venice Biennale and a new show in Dubai ...

From THE ECONOMIST online

For Walid Siti, a Kurdish artist, the river Zei is a powerful subject. The Zei is the Kurdish name for the Great Zab river, which runs from Turkey and joins up with the Tigris south of Mosul, and it has seen its share of conflict. For Iraqi Kurds it was the backdrop of their battles against Saddam Hussein's murderous regime; the surrounding mountains are where Kurdish militants would seek sanctuary from the authorities. Siti's own father, a trade unionist, often took refuge in the very mountains that his son has painted, in all their imposing bleakness. On display at the Iraqi Pavilion at the 54th Venice Biennale, Siti's works convey an intimacy with this region—the river, the mountains—that belies the peripatetic life he has led.

Born in Duhok in Iraqi Kurdistan in 1954, Siti studied fine arts in Ljubljana from 1977 until 1982. Iraq enjoyed good relations with the former Yugoslavia at the time, so this seemed a natural choice. But when the Iraqi government complained of Siti's opposition to its increasing intolerance of minorities, the Kurds among them, the Yugoslav authorities "pressured him to leave," says Siti. Though he had only expressed his opposition through meetings with other like-minded émigrés, this was enough to make him suspect in Yugoslavia, where authorities were concerned with internal dissidents. Siti was fortunate in only being made to leave; one of his colleagues was deported to Iraq and spent the next 20 years in Abu Ghraib prison. Thanks to the help of a friend, Siti was able to relocate to London instead, where he has lived ever since. His first years were "lonely", but he persevered with his work. But it was only after the first Gulf war, when a self-governing Kurdistan was created in the north of the country, that Siti was able to return to his homeland, which he has visited with increasing frequency since 2004.

This renewed connection with Iraq has strengthened Siti's clear-eyed take on the most visible—but often overlooked—features of that country's topography. The largest painting in "The River Zei" exhibition, which

ran over the summer at Rose Issa Projects in London, depicted a mountain (*pictured*), with a mishmash of grey horizontal lines and vertical black strokes that seem to float on top of the canvas. Siti's palette is monochrome but wonderfully apt. His blues border on the teal, his reds are roanish, while his whites are dirty. But it is the gritty crayon strokes that captured my attention, as if they were some illegible script, or alphabet. His river Zei is similarly ghostly, like the terrain of a land that is chafing under successive droughts and unfettered development. The artist explains that the image of the river haunted him, "how this important natural resource is now under threat". Rose Issa, whose gallery represents Siti, sees the mountains and rivers in his paintings as symbols that "convey energy and counterforce, reflecting his perception of the cyclical and

repetitive patterns of life and death".

This is not Siti's debut in Venice, having previously appeared in the 2009 biennale, but he is proud to be part of the first Iraqi pavilion to not require ideological approval from the country's government. The theme of the Iraqi show is Acqua Ferita, or "Wounded Water", and was a project that took eight years to materialise. One of Siti's contributions to the show is an installation featuring a video clip of a waterfall projected through the middle of a giant torn banknote. The work is one of the most striking pieces in the pavilion. It feels optimistic, as if representing Siti's ability to see past Iraq's recent sectarian record and into a unified future. Unlike the other artists in the exhibit, his work seems more personal, less didactic. His Iraq is one that allows nature to speak for itself. This hopefulness is intrinsic to both his work and personality.

Siti likens the situation in Erbil, the capital of Iraqi Kurdistan, to "a disorganised gold rush". He knows the liberal, market-oriented atmosphere is a good thing, but he is aware that "art is not a priority". Inspired by Dubai's example, Erbil's authorities run the risk of sacrificing both their culture and natural surroundings for the sake of rapid growth, he warns. This analysis inspired the title of his new exhibition "Erbil–Dubai: Chasing Utopia", which opened yesterday at the XVA Gallery in Dubai. Siti's work is prized in Dubai, where a nascent arts scene is creating new opportunities for regional artists, but he admits to having reservations about the Emirates' efforts to assume a leading role in the Middle East's art world.

At a time when his country is in need of voices such as his, it is welcome to hear that Siti sees himself returning to Iraq permanently in the near future. "I'm forging a closer connection to what is happening there," he says. "My city recently commissioned a sculpture from me, the concept of which was recently approved." He recognises that, as a Kurd, he has been able to enjoy opportunities that are more limited for Iraqis living in

other, more unruly parts of the country. “Hopefully they will have the same opportunities in a few years' time, in spite of all the chaos.” And yet the Kurdistan Siti knew in his youth, as he sees it, has almost disappeared. This is a result of the traumas the region has had to endure, first under the Baath, and now under the occupation, but Siti seems wary of concentrating on the political quagmires. He is more concerned with the road ahead.

*"**Erbil–Dubai: Chasing Utopia**" runs until December 5th at the XVA Gallery in Dubai. Walid Siti’s work is also on display at the Iraq pavilion at the Venice Biennale until November 27th.*

Images are courtesy of the artist and Rose Issa Projects.

***André Naffis-Sahely** is a poet and translator. His translations of Abdellatif Laâbi's "Le fond de la jarre" and Frankétienne's "Mûr à crever" will be published by Archipelago Books in 2012.*

http://moreintelligentlife.com/content/arts/a-vision-future

Zynga's CastleVille: Let's put social games to the fun test

Nov. 05, 2011 | 9:15 a.m.

Yvette from CastleVille, with the game's slogan "Create Your Happy Ending." (Zynga)

The coming launch of Zynga's CastleVille is spurring new debate over whether social games are truly fun.

One side — let's call them the Intrinsics — says the ceaseless clicking that social games require is ultimately shallow. The opposite camp — the Extrinsics — says millions of people who play social games every day wouldn't be doing it if they *weren't* having fun.

Who's right? We asked Nicole Lazzaro, a psychologist and an expert on what makes games fun to play. Lazzaro, who has spent years dissecting all manner of bestselling games to discover the essence of fun, boiled it down to four ingredients.

Put simply, fun games engage players' curiosity, allow players to socialize with friends, challenge players to overcome obstacles to achieve goals and somehow relate to people's lives in a meaningful way. In her opinion, the vast majority of top games have three, if not four, of these elements.

So how do social games, including Zynga's FarmVille, CityVille and soon CastleVille, score on Lazarro's fun meter?

On the first factor — engaging players — social games aced the test.

"These games are highly engaging," Lazzaro said. "They do this by providing over-the-top rewards."

Nicole Lazzaro

To see what Lazzaro means, try clicking on anything in CityVille, a game played by about 12 million people a day. Coins and stars explode onto the screen, and the game spews out a tintinnabulation of victory bells. Zynga has a term for these bits of digital confetti — "doobers." And they serve to trigger endorphins in the same way that slot machines reinforce player behavior.

The games also "delight and surprise" (game design jargon for doing something players didn't expect) through a trick used in the casino business that psychologists call the intermittent response loop.

Sometimes, players get a bonus item, along with the coins and stars, that can be used elsewhere in the game — an extra bit of energy, a piece of Halloween candy that can be traded for a haunted house, and so on.

"Not every click produces this reward," Lazzaro said. "It encourages people to click even more in order to get to that jackpot."

Social games also score high on the friend front. For some, the engagement is minimal: I send a gift to you, and you send it back to me. The end. Most of the time, players aren't even playing at the same time and the interactions are delayed. Mark Skaggs, a Zynga senior vice president who produced FarmVille and CityVille, calls social games the "TiVo for relationships."

Yvette with animals in a scene from Zynga's CastleVille, the latest title in the company's "ville" games that include FarmVille, CityVille and others played by millions of people every day. (Zynga)

For others like Lana Sumpter, the game is a vehicle for people to gather, kibitz about their lives over headsets on Skype and form strong friendships.

Social games don't do so well creating enough of an interesting challenge, the third element of fun, Lazzaro said. Because they need to appeal to a wider population, most of whom don't see themselves as gamers, social games have to be easy, at least initially.

"A lot of people start a social game and leave because there's not enough of a challenge to keep them there," Lazzaro said. "The achievements are so quick and shallow that players don't even have time to reflect on how trivial the activity was."

Ouch! We'll take that assessment as a "Has Room for Improvement" grade.

Finally, in what Lazzaro calls "intrinsic fun," most social games fail almost completely. Intrinsic fun relies on players wanting to do something for the sheer fun in doing it.

CastleVille's cast of characters. (Zynga)

Extrinsic fun is tied to rewards. Like Pavlovian pigeons, players perform tasks primarily to get the rewards. Some game designers, including Chris Hecker, believe game mechanics that rely too much on extrinsic rewards run the risk of becoming a grind.

“Extrinsic fun relies on collecting points and badges,” she said. “Intrinsic fun, what I call hard fun or serious fun, relies on engagement beyond just rewarding players to click.”

Some examples of games that deliver on serious fun, according to Lazzaro, are Dance Dance Revolution, which has helped a number of players lose weight as they scramble to match patterns on a dance mat. Another is Striiv, a key-chain pedometer that lets users translate steps into progress in a game as well as donations to clean water, polio vaccinations or preserving rain forests.

Jason Brown

Jason Brown, vice president of player insights for Zynga, says the company routinely asks players why they play. It's a valid question, because more than 200 million people fire up a social game at least once a month, even as entertainment options proliferate.

"It turns out, our games tap into some fundamental drivers of human happiness," Brown said. According to theories put out by psychologists such as Jonathan Haidt and others, humans are happiest when they a) sense they have control over their environment; b) are connecting with friends; or c) feel they are challenged but making progress toward a goal.

Social games help people feel all three, Brown contends. "They're free. They're great entertainment. And they're a way to stay in touch with their friends."

The upshot? Fun is ultimately in the mind of the player.

– Alex Pham

http://herocomplex.latimes.com/2011/11/05/zynga-castleville-farmville-cityville-social-games/

A LADY WITH TWO FACES

"Lady with an Ermine" is the second-most famous woman in Leonardo's life. As she makes a rare trip to London, Francesca Kay looks at her magic ...

From INTELLIGENT LIFE magazine, November/December 2011

Consider the ermine: a stoat in winter fur. Stoats are small and fierce and quick and feral; they kill by biting the necks of their prey; they are said to mesmerise their larger victims with a snake-like dance. And now look at Leonardo da Vinci's ermine, resting quietly, although still very much alert, in the loose grip of his mistress. His left paw is upraised in a heraldic gesture. He has intelligent eyes, his mouth is closed over sharp teeth, his fur is soft and creamy, and his owner's long fingers rest gently on him. This is a beautiful, sleek creature, a beloved pet.

The lady is Cecilia Gallerani, aged about 16 when her portrait was painted, c.1490, and at that time the favourite mistress of Lodovico Sforza, the immensely powerful duke of Milan. In the year after she was painted, Cecilia gave birth to Lodovico's son, and Lodovico married Beatrice d'Este, who soon ensured her rival was dismissed. Records suggest that when she left the Sforza castle, Cecilia took the painting with her.

"Lady with an Ermine" lives in Krakow these days, but she is about to be displayed in Britain for the first time. The National Gallery in London is bringing together seven of Leonardo's paintings—half of his surviving works of paint on wood–and more than 50 drawings, from the period when he was the court painter in Milan. There will be other famous paintings in the exhibition, but it is Cecilia who will be the star.

We can reasonably assume that the portrait was commissioned by Leonardo's patron, the enamoured duke. Cecilia was apparently as gifted as she was lovely—a poet, linguist and musician. Why then did Leonardo pair her with an animal that few would call endearing? Why draw attention to the stoat-like shape of Cecilia's face: was it a waspish tease, a moral rebuke, a subtle act of malice?

On one level the inclusion of the ermine is a tribute to Lodovico, who used it as an emblem. There is a knowing joke here: a ruthless lord is fondled by his mistress, made submissive by the power of love. But, in another aspect, this animal is Cecilia herself. See how the curve of Cecilia's shoulder rhymes perfectly with the curve of the ermine's body, how her bent wrist echoes its paw, how the two are connected in a sinuous flowing spiral, how their matching eyes, clear and brown, look at the same point to their right—both at the duke, we presume, who, in this most elegant of compositions, is also the source of light. The ermine and the girl are almost indivisible, two aspects of one being: you can see how they inspired Philip Pullman's daemons, the animal spirits or alter-egos that were such a telling feature of "His Dark Materials".

In folklore the ermine was a symbol of purity, because it was supposed to prefer death to the defilement of its snowy coat. Leonardo knew this—the Fitzwilliam Museum in Cambridge has a drawing by him of the myth. But no one as observant as Leonardo could fail to see that the ermine has two faces, and that in its stoat-guise it is brown, smells musky and is vicious.

"The good painter has to paint two principal things," Leonardo wrote of figure painting, "that is to say, man and the intention of his mind." Yes, but the intentions of a man's mind—or a woman's—are not singular. One reason for the great allure of this painting is the hint of troubling duality. Stoat and ermine, lover and beloved, girl and animal—beautiful Cecilia, with her immaculate white skin, is a mistress, not a lawful wife. She could equally be predatory as pure and honourable; she could indeed be prey herself. The potentially dangerous creature in her arms is captive, for the moment. But while Cecilia may have captivated the mighty Lodovico, she herself, dependent on patronage like the painter, is subject to his will. There's not much security in the post of ducal pet, as Cecilia would soon discover. The fillet on her brow, the edging of her veil, the beads around her neck, her helmet hair, may all be in the latest fashion, but they bind Cecilia closely.

Those bindings have another function—to highlight the perfect proportions of the woman's head. And here's the real purpose of the portrait. Leonardo wrote that beauty lies in harmonious proportion, and beauty inspires love. This is above all a painting of supreme harmony, the creation of a perfect whole through total mastery of line and shadow, light and form. Look at this woman, Leonardo is saying: ambiguous and flawed like every human being, but beautiful and lovable. Now, though, after more than half a millennium on this earth in her painted incarnation, Cecilia is also very fragile; she may never be allowed to go travelling again. Seize the chance to see her.

*"**Leonardo da Vinci: Painter at the Court of Milan**" is on at the National Gallery in London from November 9th to February 5th*

***Francesca Kay** is the author of "An Equal Stillness", which won the Orange Award for New Writers. Her second novel is "The Translation of the Bones".*

http://moreintelligentlife.com/content/arts/a-lady-with-two-faces

When TV used to be really dangerous

Last Updated: 10:46 PM, November 5, 2011

Posted: 4:26 PM, November 5, 2011

Phil Mushnick

PRIME TIME

There it was, leaning against the side of someone's house. Hadn't seen one in years. It was a functioning relic, a wooden, two-story extension ladder. Once upon a TV time, homeowners kept them on their sides in their garages, awaiting their use for mostly one of two things:

1) Cleaning leaves out of the roof gutters,

2) Adjusting the TV antenna on the roof, futilely in search of a better path to the top of the Empire State Building, which, legend had it, held the secret to optimal TV viewing.

Sometimes, 2) would double back on 1): "While you're up there, Sam, clean out the gutters. . . And be careful."

Everett Collection
James Garner charmed as Maverick.

And the truth was that few neighborhoods were free from serious injuries and even fatalities that began with men ascending such ladders in order to adjust TV antennas, the preface to two-story falls.

It strikes me that we may be in need of a National Television Heritage Day, not to recall what we watched, but how we watched. If kids and grandkids ever knew . . .

And they should know.

They should know that TVs didn't just "turn on," they first had to "warm up," sometimes for close to a minute before a picture gradually, as from a mist, began to appear on the screen.

They should know that TV's with tiny screens came encased in large wooden cabinets, many with little red buttons at the bottom that used to light to indicate that the TV was on.

They should know that here in New York, we were lucky -- we had *seven* channels to choose from, while our country cousins often had no more than three. We had Channels 2, 4, 5, 7, 9, 11 and 13 -- a cornucopia!

Here's a mind-blower for the kids: *You had to get up and walk across the room in order to switch channels!* For real. We had no remotes to lose between the cushions of the couch. Even old-timers must now recall that as ancient history.

And parents would holler at their kids to turn the channel knob slowly, or, "You'll break it!" A busted channel knob was a serious problem. Better you should break a window. In our house, for what seemed like months, we used a pair of pliers to turn the channel.

And many homes had only one TV. If the Sunday night battle was between "The Ed Sullivan Show" on CBS and "Maverick" on ABC, there could be only one winner; there was no taping or DVR-ing anything. You watched it when it was on.

In some neighborhoods, one-TV neighbors would switch homes for an hour or two, depending on viewing tastes. "I'm going over to the Crowley's to watch 'Dick Clark' " was not an unusual Saturday night so-long.

Sally Parrinello of Elmont had one TV set and three sons. She'd assign each one a rotating week during which Dennis, Richard and William could choose the programs. Love it or leave it. "It worked," said William.

Early color TV came mostly in just six colors: traditional black, white and gray, plus new-age purple, pink and green. One could "fiddle" with the color knobs for hours with no improvement. High-def? This was No-def TV, yet a color TV set provided elevated neighborhood status, like a Chrysler or a four-slice toaster.

So whattya think? National TV Heritage Day. Hey, kid, ever hear of "rabbit ears"? They sat atop TV sets. That's right. Am I boring you?

Reader Dom LaVarco notes that last weekend's snow led to a local TV record-breaker: Earliest a news crew was dispatched to a Home Depot to try to find someone buying a shovel.

Read more:

http://www.nypost.com/p/entertainment/tv/when_tv_used_to_be_really_dangerous_eNQbWHSdjqrSm8mX2SdvDK#ixzz1d9MFCTAf

FILM-MAKING WITH A CROWBAR

Nicholas Barber feels patronised by "Snow Flower and the Secret Fan", a film which mixes 19th-century China with 21st-century issues ...

Special to MORE INTELLIGENT LIFE

Fans of Lisa See's bestselling novel, "Snow Flower and the Secret Fan", can't have been surprised when the book was made into a film. A tale of sworn friendship between two women in 19th-century China, it's got enough plague, death, revolution and foot-binding to warrant a proper screen epic. But the book's admirers might be surprised to discover that Ms See's plot takes up just half of the running time. Unlike the novel, Wayne Wang's screen adaptation intercuts between the 19th century and the 21st, when viewers meet two more Chinese women with their own issues to contend with, from miscarriage and exam fraud to listening to Hugh Jackman crooning in Mandarin.

According to press materials, this new material was crowbarred in at the behest of Mr Wang, the director. "Wayne's vision was to make the story much more relatable to women today, by pursuing parallel stories, one in the Old China and one in the New China," says the film's producer, Wendi Murdoch. What next, you might ask? How else might period dramas be made "much more relatable" to today's audiences? Perhaps a film about the Holocaust could compare the massacre of several thousand Parisian Jews to an American journalist's uncertainty about her marriage 70 years later. Maybe a film about Wallis Simpson and Edward VIII could intercut the abdication with a strand about a hip New York art dealer with her own marriage problems.

Far-fetched (and dreadful) as those scenarios might seem, both of them exist already. The Holocaust drama is "Sarah's Key", starring Kristin Scott Thomas, which comes out on DVD in late November. The Wallis Simpson biopic is Madonna's "W.E.", which is due in January. Both films promise to leave viewers with the same queasy feeling I had after watching "Snow Flower and the Secret Fan".

These films have several things in common. In each case the scenes set in ye olde days are much more dramatic than those set in the present, which suggests that the film-makers are embarrassed by the triviality of modern life. The message is that workaday bourgeois concerns need to be spiced up by the horrors of a more turbulent time in order to be interesting on screen. But the dual narratives also belittle the past. They imply that previous lives don't matter unless they illuminate our own. Foot-binding can't be shocking in and of itself, it seems: it's only worth mentioning if we, too, feel as if our feet are metaphorically bound. There's yet more narcissism in the fact that the films' contemporary characters are all writing books or researching projects about the historical incidents we're shown, just as the films' own screenwriters must have done. In essence, the film-makers are writing themselves into the story. "The stuff I've dug up on the Holocaust is all very interesting," they're saying. "But let me tell you what I was going through while I was digging ..."

That doesn't mean that the technique is never worthwhile. When the counterpointing is done with care and insight, in literary fiction such as Michael Cunningham's "The Hours" and A.S. Byatt's "Possession", the strands weave together into a rich tapestry. But novels can slip between time periods far more easily than films can. On a practical level, a 400-page book has more room to fit in multiple narratives than a two-hour film does.

The main effect of the back-and-forthing in "Snow Flower and the Secret Fan" is to insult the audience. It assumes that we don't have the imagination to sympathise with people from a pre-iPhone era. Apparently we need intermediaries to remind us of how we're all connected. How else could the film be "relatable to women today"? But what about men today? Maybe Mr Wang should have stuck in a third strand, in which a bunch of men sit and watch the film, and chat about how they, too, feel as if they're having their feet bound. When working with a good metaphor, perhaps it is best to not be too subtle.

*"**Snow Flower and the Secret Fan**" is in cinemas in Britain.*

***Nicholas Barber** is a film critic who writes reviews for the* Independent On Sunday *and previews for* Intelligent Life. *His last piece for* More Intelligent Life *lamented the rise of motion-capture animation.*

http://moreintelligentlife.com/content/arts/nicholas-barber/film-making-with-a-crowbar

We live, strictly speaking, in a pre-modern society"

by Kien Nghi Ha — 04.11.2011

Is national identity obsolete? Postcolonial theorist Kien Nghi Ha sat down with Anna Polonyi to discuss German integration, the racism behind the Enlightenment and the future of the nation-state.

The European: You spoke at a panel discussion with the Turkish-German author Feridun Zaimoglu. The event was entitled "Vibrationshintergrund" [vibration background]. What is the significance of this wordplay?
Ha: It's about challenging German society's widely accepted perspective on immigrants that sees them as an inherently problematic group with deficiencies. In the past, particular forms of therapy, the so-called "foreigner pedagogy", were developed in order to re-socialize these individuals and to integrate them into German society. The focus on deficits reveals how for a long time, Germany did not conceive of immigrants and their cultures as a positive, enriching element. This is based on an ideology that has nothing to do with the everyday experiences of individuals. There are two realities here: the ideological and sociocultural one. The first reality is shaped on the one hand by mainstream discourses, which have created their own "immigrant problem," German policy and laws on foreigners, which attempt to regulate and control immigrants, because they are construed as a potentially dangerous group. On the other hand, there is also the reality of migration, which individuals experience in daily life: people of diverse origins are neighbors, become friends, fall in love with each other and have children together.

The European: Integration as a discourse has existed for some time. Why is this concept being criticized?
Ha: Integration as a concept is very unclear. The term may mean social participation, equal rights and opportunities in political, social and cultural contexts. It can also very clearly focus on cultural assimilation,

whereupon foreigners are requested to give up their non-German identities in order to become German in a pre-fab way, which is unnatural for there is no original German identity to begin with. German culture is not static; it is as difficult to define as American, Turkish or Vietnamese culture is. Nevertheless, the illusion of a prescribed and apparently given German culture is adopted, one into which immigrants are meant to fit in and orient themselves accordingly. When they fail to do this, they are threatened by penalties, and are viewed as incapable or unwilling of integration: this is a development we have seen since the introduction of compulsory integration courses in 2005, which affect mostly Muslims and people of color. Increasingly, integration is meant as a forceful coercion to submit to German society rather than an invitation to participate as a self-determined equal within that society.

The European: To what extent must one give up one culture in order to belong to another?
Ha: All individuals have a variety of different identities that they simultaneously operate with. Ideally, one would have a political structure and culture which allows individuals to be German in a variety of ways, such as in the United States, where being American can mean a lot of different things: African-Americans, Asian-Americans, white Americans come in all shapes and sizes. In Germany, this kind of pluralization of national culture and identity is at best rudimentary. Changes are slowly being brought, particularly in cultural areas that allow for hyphenated identities: one can be identified as German-Turkish, or Asian-German, or Black German. But these are for the most part peripheral changes, which have had little impact on the general public's consciousness until now. We are still dealing with a dominant narration that speaks of a "German culture" in the singular, and thinks of it in terms of a necessary exclusion of other cultural identities.

The European: Must one be critical towards a dominant culture, be it German or American, simply by virtue of its dominance?
Ha: The dark side of a dominant culture and its political discourse is that it represses other histories and minority positions by making them invisible. I believe that it is necessary to subvert dominant structures through cultural, social and political activity if we are to strive towards a society that is as free of coercion and domination as possible. This can only happen if the suppressed and marginalized parts of this society cultivate a voice and demand that it be heard and listened to.

The current common understanding of German culture boils down to the controversial formula of a German Leitkultur [guiding culture]. This is absurd idea has become a common expression in German political culture. The CDU professes loyalty to this Leitkultur in its party manifesto. We should ask ourselves: do we want to live in a mono-cultural society, or rather one in which political as well as cultural pluralism is possible, and individuals can be different and still be recognized as members of the same society?

The European: One has to feel part of a society in order to criticize it.
Ha: I do not think that we need the term "integration" at all in order to talk about social participation and democratic rights. It is clear that as soon as we begin to speak about guest-workers here in Germany, we are in fact talking about a range of people who have been in here for up to fifty or sixty years; some are here as 3rd generation migrants. They are fundamental elements of this society. That is a fact that simply cannot be ignored. Various terms for their historical presence can be used, and in the worst of cases, these terms conceal this fact: for instance, one still speaks of "foreigners," even though these individuals can no longer in any rational way be described as "foreign." They are only foreign in so far as society refuses to grant them their German citizenship in a fair way. It is undoubtedly a question of political willingness for the German public who has until now held the terms and conditions of German citizenship too high for marginalized migrant groups. One should at least be honest enough to recognize the goal of this kind of politics; at least Thilo Sarazzin publicly recognized that Germany does not want any Muslim immigrants.

The European: Is there an "immigration problem" to speak of?
Ha: It would be better to speak of a democracy deficit and structural racism in Germany, rather than about an integration or immigration problem per se. That is the real core of the problem, and talking about it in those terms would change our perspective. Integration is always the problem of the Other: it is the foreigners, the

Turks who are not integrated and who don't want to be, because they are of Muslim faith and their allegedly backward beliefs stop them from giving up their Turkishness, and thus they cannot embrace womens' rights. The ideology behind the discourse of integration is constantly constructing and problematizing the postcolonial Other in order to inflate the value of an imagined German cultural heritage. If we are to begin thinking about it in terms of a democratic deficit, then other questions and answer would arise: what can German society do in order to correct this breach in democracy? We could talk about the blind spots of this society and discuss the possibility of reforms that would endow individuals who have been part of this society for decades with their democratic rights.

The European: You mentioned the link between racism and the Enlightenment. Could you talk more about that?
Ha: That is a very interesting, but also very difficult question, as the history of the Enlightenment spans many centuries. What interests me intellectually is the political importance of thematizing the Enlightenment in more complex and contradictory terms than our euro-centric perspective has allowed up until now. I would like to cast doubt on whether one can truly think of the Enlightenment as a linear path of progress. Historically speaking, colonialism and the philosophy of Enlightenment did not necessarily stand in opposition to one another. "Great philosophers," such as Voltaire and Kant have been idealized as the icons of Western enlightened thinking. What is commonly overlooked is the fact that they were also protagonists in a discourse which constructed race. As theorists of race, they contributed significantly to a colonial discourse and are partially responsible for the establishment of this worldview, which allowed for colonial-racist exploitation and practices of suppression.

I believe that the connection between the colonial project and modern Europe is one that we must be very aware of, particularly as part of a culture that prides itself in being enlightened, i.e. self-critical. It is indeed important that we be self-critical, particularly at a time when this alleged "Enlightenment" is being used as a politically charged term and a means by which to alienate Muslim communities. It is important to have a self-critical understanding of the Enlightenment, in order to clarify that there is no rational basis for any kind of "Clash of Cultures" binary. Unfortunately, it is very easy today to use the concept of Enlightenment as a political instrument that enables Westerners to justify their dominance and to continue to claim themselves politically and culturally superior to Muslims, because they are allegedly enlightened, and the latter are not.

The European: When talking about identity, nation-states are often the first point of reference. With current global problem that cannot be solved at the scale of nation-states, is this way of creating an identity still legitimate?
Ha: The sovereignty of nation-states is challenged in a variety of ways. Firstly there is the dimension of economic globalization, which is about capital flows and an interdependent world economy. Secondly, there is also the challenge from super-national structures such as the EU. But what the nation-state is most loathe to give up is its bio-power. The nation-state—and Germany is a good example here—wants to maintain control over migration by all means, even with the military, if necessary. Frontex is exemplary of how the external borders of the EU are being protected according to bio-political priorities concerning the make-up of the European and not least of all German population. But these goals are unrealistic, as the nation-states have been weakening for some time now, and the external EU borders are constantly being crossed. Nevertheless, these borders are meant to be held up as an ideological fiction, even at the price of our humanity. It is widely understood that illegal immigration is also a phenomenon in Germany. As in all other EU countries, this is a phenomenon that seems to be growing. And yet it appears to be ignored politically until it can no longer possibly be ignored.

The European: But when every group defines itself in that it excludes others?
Ha: It is correct that group identity defines itself by distinguishing itself from others. But here we are talking about modern nation-states. Nation-states are structures of such size that they are not based on personal networks or relations, but rather collective symbols, such as national hymns and flags. Personal relationships have no significance within these kinds of anonymous social structures. Citizenship cannot be based on the

fiction of a common culture, but rather functions as a membership in a common political-democratic project, in which individuals are granted equal rights, freedoms and responsibilities. The promise of modernity is that individuals should have the freedom to decide in what society they want to live in. That is what is meant by democracy: that social power structures are not given by God or nature, but that the possibility to change them by making democratic decisions is in our own hands. As long as millions of immigrants are continuously being shut out of this democratic system, we live, strictly speaking, in a pre-modern society. Nation-states are a relatively young, modern phenomenon. They are changeable. It is rather a question of political decision-making process, of how states and societies want to organize themselves. If we were to initiate a political movement, and people were to be of the opinion that they no longer want to live in a nation-state, but rather another form of social structure, then democrats would have to discuss post-national societal forms. Nothing is automatic; there is no natural or divine necessity for a nation-state.

About the Author

The postcolonial critic Kien Nghi Ha was born in Hanoi and has studied cultural and political science with a special emphasis on migration and the Asian diaspora. He is currently a guest professor at the Asien-Orient-Institut at the University of Thübingen and is a fellow at the Insitute for Postcolonial and Transcultural Studies at the University of Bremen. He has published a number of books on ethnicity and migration.

http://www.theeuropean-magazine.com/412-ha-k/413-migration-and-integration

THE BEST TIME: EARLY CHILDHOOD

For Ann Wroe, life is best when the world is simple, new and there to be discovered ...

From INTELLIGENT LIFE magazine, November/December 2011

I'd choose to live in very early childhood, just at the beginning of discernment. There's no time there, beyond the eternal rhythm set by meals at the breast and the oblivion of sleep, which comes as gently and immediately as the closing of an eye; there's no place there, beyond one patch of sunlit grass, one fold of blanket, and the whole enormous world laid out for exploring.

In this time and place, poets tell us, dreams and waking are the same; we move easily from one to the other. We may still keep, as Wordsworth supposed, intimations of some ante-natal life, and know why we home like bees towards the song of a bird or the sparkle of sunbeams on water. With our small hands, we believe that everything can be grasped; with our small, soft mouths we try to eat it all, assuming everything we find will be sweet and rich as milk.

No one makes demands on us, and the world revolves effortlessly round no one but ourselves. Our griefs are soothed and forgotten almost before the tears fall. We are carried if we want to be, in hugging arms, but we can pull ourselves up, reach things, and creep away from where we're put: every day more confident, stronger, keener-eyed. Slowly, like a shell, the world opens and light floods in. Any day now, we'll stand to meet it.

Everything is new, unnamed, important, and belongs to us. A stone is new, and a blade of grass. We see their potential as unlimited, like our own. We make time for it. A puddle astonishes us. A piece of paper, blown by the wind, becomes a playmate, and the night-time tree a ragged monster. Coleridge once took his crying baby

son out of the house to show him the moon; the moon silenced him, shining on his tears. It is good to be silenced by beauty. Too briefly we stay there. But infancy makes of everywhere the best time and the best place.

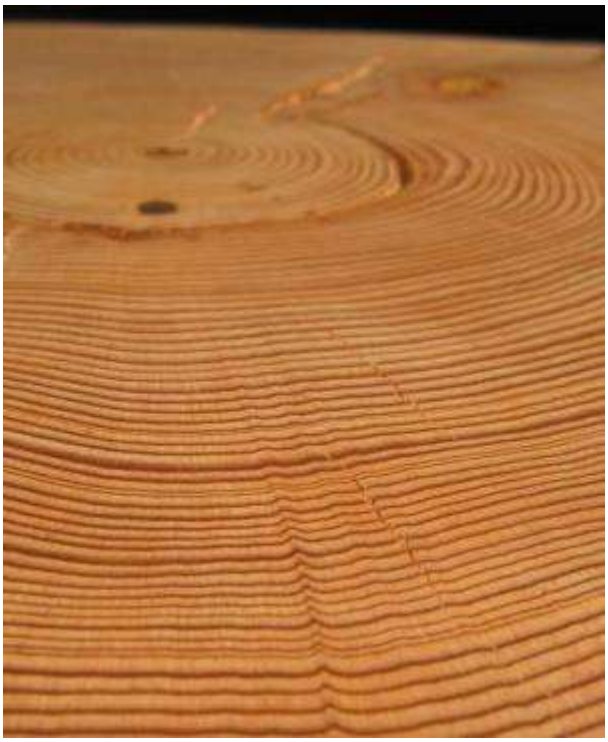
Ann Wroe *is the obituaries editor of* The Economist *and author of "Orpheus: The Song of Life" and "Being Shelley: The Poet's Search for Himself".*

What do you think is the best time and place to be alive? Read Arkady Ostrovsky on pre-revolutionary Russia; Robert Guest on Heian-era Japan; Lucy Kellaway on America c.15,000BC; J.M. Ledgard on Princeton in 1949; and Patrick Dillon on London in the 1690s. Have your say by voting in our online poll.

Picture credit*: Getty*

http://moreintelligentlife.com/content/ideas/ann-wroe/best-time-early-childhood

Scientists Find Evidence of Ancient Megadrought in Southwestern U.S.



A cross section of wood shows the annual growth rings trees add with each growing season. Dark bands of latewood form the boundary between each ring and the next. Counting backwards from the bark reveals a tree's age. (Credit: Photo by Daniel Griffin/Laboratory of Tree-Ring Research)

ScienceDaily (Nov. 6, 2011) — A new study at the the University of Arizona's Laboratory of Tree-Ring Research has revealed a previously unknown multi-decade drought period in the second century A.D. The findings give evidence that extended periods of aridity have occurred at intervals throughout our past.

Almost 900 years ago, in the mid-12th century, the southwestern U.S. was in the middle of a multi-decade megadrought. It was the most recent extended period of severe drought known for this region. But it was not the first.

The second century A.D. saw an extended dry period of more than 100 years characterized by a multi-decade drought lasting nearly 50 years, says a new study from scientists at the University of Arizona.

UA geoscientists Cody Routson, Connie Woodhouse and Jonathan Overpeck conducted a study of the southern San Juan Mountains in south-central Colorado. The region serves as a primary drainage site for the Rio Grande and San Juan rivers.

"These mountains are very important for both the San Juan River and the Rio Grande River," said Routson, a doctoral candidate in the environmental studies laboratory of the UA's department of geosciences and the primary author of the study, which is upcoming in *Geophysical Research Letters*.

The San Juan River is a tributary for the Colorado River, meaning any climate changes that affect the San Juan drainage also likely would affect the Colorado River and its watershed. Said Routson: "We wanted to develop as long a record as possible for that region."

Dendrochronology is a precise science of using annual growth rings of trees to understand climate in the past. Because trees add a normally clearly defined growth ring around their trunk each year, counting the rings backwards from a tree's bark allows scientists to determine not only the age of the tree, but which years were good for growth and which years were more difficult.

"If it's a wet year, they grow a wide ring, and if it's a dry year, they grow a narrow ring," said Routson. "If you average that pattern across trees in a region you can develop a chronology that shows what years were drier or wetter for that particular region."

Darker wood, referred to as latewood because it develops in the latter part of the year at the end of the growing season, forms a usually distinct boundary between one ring and the next. The latewood is darker because growth at the end of the growing season has slowed and the cells are more compact.

To develop their chronology, the researchers looked for indications of climate in the past in the growth rings of the oldest trees in the southern San Juan region. "We drove around and looked for old trees," said Routson.

Literally nothing is older than a bristlecone pine tree: The oldest and longest-living species on the planet, these pine trees normally are found clinging to bare rocky landscapes of alpine or near-alpine mountain slopes. The trees, the oldest of which are more than 4,000 years old, are capable of withstanding extreme drought conditions.

"We did a lot of hiking and found a couple of sites of bristlecone pines, and one in particular that we honed in on," said Routson.

To sample the trees without damaging them, the dendrochronologists used a tool like a metal screw that bores a tiny hole in the trunk of the tree and allows them to extract a sample, called a core. "We take a piece of wood about the size and shape of a pencil from the tree," explained Routson.

"We also sampled dead wood that was lying about the land. We took our samples back to the lab where we used a visual, graphic technique to match where the annual growth patterns of the living trees overlap with the patterns in the dead wood. Once we have the pattern matched we measure the rings and average these values to generate a site chronology."

"In our chronology for the south San Juan mountains we created a record that extends back 2,200 years," said Routson. "It was pretty profound that we were able to get back that far."

The chronology extends many years earlier than the medieval period, during which two major drought events in that region already were known from previous chronologies.

"The medieval period extends roughly from 800 to 1300 A.D.," said Routson. "During that period there was a lot of evidence from previous studies for increased aridity, in particular two major droughts: one in the middle of the 12th century, and one at the end of the 13th century."

"Very few records are long enough to assess the global conditions associated with these two periods of Southwestern aridity," said Routson. "And the available records have uncertainties."

But the chronology from the San Juan bristlecone pines showed something completely new:

"There was another period of increased aridity even earlier," said Routson. "This new record shows that in addition to known droughts from the medieval period, there is also evidence for an earlier megadrought during the second century A.D."

"What we can see from our record is that it was a period of basically 50 consecutive years of below-average growth," said Routson. "And that's within a much broader period that extends from around 124 A.D. to 210 A.D. -- about a 100-year-long period of dry conditions."

"We're showing that there are multiple extreme drought events that happened during our past in this region," said Routson. "These megadroughts lasted for decades, which is much longer than our current drought. And the climatic events behind these previous dry periods are really similar to what we're experiencing today."

The prolonged drought in the 12th century and the newly discovered event in the second century A.D. may both have been influenced by warmer-than-average Northern Hemisphere temperatures, Routson said: "The limited records indicate there may have been similar La Nina-like background conditions in the tropical Pacific Ocean, which are known to influence modern drought, during the two periods."

Although natural climate variation has led to extended dry periods in the southwestern U.S. in the past, there is reason to believe that human-driven climate change will increase the frequency of extreme droughts in the future, said Routson. In other words, we should expect similar multi-decade droughts in a future predicted to be even warmer than the past.

Routson's research is funded by fellowships from the National Science Foundation, the Science Foundation Arizona and the Climate Assessment of the Southwest. His advisors, Woodhouse of the School of Geography and Development and Overpeck of the department of geosciences and co-director of the UA's Institute of the Environment, are co-authors of the study.

Story Source:

The above story is reprinted from materials provided by **University of Arizona**. The original article was written by Shelley Littin, NASA Space Grant intern, University Communications.

Note: Materials may be edited for content and length. For further information, please contact the source cited above.

Journal Reference:

1. Cody Craig Routson, Connie Woodhouse, Jonathan T. Overpeck. **Second century megadrought in the Rio Grande headwaters, Colorado: How unusual was medieval drought?** *Geophysical Research Letters*, 2011; DOI: 10.1029/2011GL050015

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