



Infoteca's E-Journal



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CONTENTS

<i>Notes from Zuccotti Park.</i>	3
Now Starting: A 60-Year Project To Build A Dome Using Living Trees	7
Brain Parasite Directly Alters Brain Chemistry	8
CROWDS R US	10
Tropical Forests Fertilized by Nitrogen Air Pollution, Scientists Find	13
The Rise of the Megacity	15
Hi-Tech Scans Catch Prehistoric Mite Hitching Ride On Spider	18
The Kyoto Accords — and Hope — Are Expiring	20
Ancient DNA Provides New Insights Into Cave Paintings of Horses	22
7 Steps For Creating Disruptive New Retail Experiences	25
Sea Life 'Must Swim Faster to Survive' to Survive Climate Change	28
Are Doctors Really to Blame for the Overdose Epidemic?	30
Castles in the Desert: Satellites Reveal Lost Cities of Libya	32
From Dream Into Nightmare	34
New Role for 'Hormone of Love' Oxytocin in Brain: Development of Brain-Body Interface	36
Debunking the Myth of the 'Freshman 15'	38
Easily 'Re-Programmable Cells' Could Be Key in Creation of New Life Forms	40
What's More Expensive, Prison Or Princeton?	42
NASA Develops Super-Black Material, Absorbs Light Across Multiple Wavelength Bands	46
Is There a City on Pluto? Before You Answer, Consider: We've Never Looked.	47
Half-Billion-Year-Old Predator Tracked: Multi-Legged Creature Ruled the Seas	49
Wanted: Worldly Philosophers	51
Ancient Lunar Dynamo May Explain Magnetized Moon Rocks	53
How Should We Pay Teachers?	55
Do Plants Perform Best With Family or Strangers? Researchers Consider Social Interactions	57
A Long, Strange "Trip to the Moon"	59
Ocean Could Have Contained Enough Methane to Cause Drastic Climate Change	62
A Brief History of Time Travel Literature	65
Using Light, Researchers Convert 2-D Patterns Into 3-D Objects	66
Can Silicon Valley and Detroit Reinvent the Car Business?	68
'Fishy Lawnmowers' Help Save Pacific Corals	70
<i>Human histories are noble undertakings, but too often the writer gets in the way.</i>	72
Greenhouse Gas Index Continues to Climb	75
Is High College Tuition Defensible?	77



Physicists Chip Away at Mystery of Antimatter Imbalance	79
China Tries to Add Cultural Clout to Economic Muscle	81
New Method for Visualizing Mechanical Forces On Cell Surface	84
The Difference Between American and British Humour	86
Sea Change Can Forecast South American Wildfires	88
Consciousness: The Black Hole of Neuroscience	90
Hubble Uncovers Tiny Galaxies Bursting With Starbirth in Early Universe	92
Why Second Life Failed	95
No Need to Shrink Guts to Have a Larger Brain	98
Peter Campbell	100
Can Fetus Sense Mother's Psychological State? Study Suggests Yes	104
Who said Gaddafi had to go?	106
Weird World of Water Gets a Little Weirder	122
Grey Panic	124
Giant Planet Ejected from the Solar System?	131
What might they want?	133
Nano Car Has Molecular 4-Wheel Drive: Smallest Electric Car in the World	137
My Egyptian Cousin	139
Obese Monkeys Lose Weight On Drug That Attacks Blood Supply of Fat Cells	142
Big Bang Theory fuels physics boom	145
America and Libya	147
Value of degrees to be revealed for first time	148
Biologists Slow the Aging Process in Fruit Flies: Study Has Implications for Humans	150
Sympathy, Not Surrender	153
Fresh warning over A-level grade inflation	155
Operation Graduation	157
China as Paper Republic	159
Composition No.1: The First Book in a Box, Redux	161
The Subconscious Shelf	163
Gilad Shalit and the Rising Price of an Israeli Life	166
Boom and bust shapes Saturn's rings	178
Ancient Stars Shed Light On the Prehistory of the Milky Way	180
Aliens don't need a moon like ours	183
Ionized Plasmas as Cheap Sterilizers for Developing World	185
Tough astronaut bugs to blast off for Martian moon	188
New Computer Chip Models How Neurons Communicate With Each Other at Synapses	190
Is it time to let some species go extinct?	193
The Strange Rubbing Boulders of the Atacama	194
Artificial intelligence joins the fossil hunt	196
Born to Roar: Lions' and Tigers' Fearsome Roars Are Due to Their Unusual Vocal Cords	198



First Person
Pre-Occupy
Notes from Zuccotti Park.
By Aaron Lake Smith



Fall is a season for insomnia. The temperate weather and the knowledge that Thanksgiving and Christmas are coming triggers a kind of physiological alarm, a manic desire to live the year-end. At 3:30 in the morning, after hours spent tossing and turning, I abruptly stood up and put on pants and a shirt. A magnetic tug called me toward the window. Yellow squares of light glowed from high-rise public housing in the distance; the moon illuminated the low-lying cloud cover.

For the first time since 9/11, New York felt restless, pregnant, as if something unexpected could still happen, as if at this late date we could still find new ways to live in the metropolis. I threw on my shoes and stood wavering, about to leave my bedroom, but not sure of where to go. A bar? Grand Central? Maybe a friend's place? But before a decision could be rationally made, my feet took over, knowing where they wanted to go. I locked my Brooklyn tenement deadbolt, went outside, and descended into the subway toward Zuccotti Park.

The G train platform is always empty at that time of night, desolate like a Bergman film. I sat on a worn-out bench. Waiting for the train, a song I haven't thought about for a very long time came out of nowhere. A song called "Sleepwalkers," on the final full-length by the seminal North Carolina hardcore band Zegota. Named for the clandestine resistance movement to the German occupation of Poland, Zegota was a kind of magnet that young activists and radicals of the early-to-mid 2000s gathered around — the spiritual force to periodically rejuvenate the political will. The band toured the world and put out beautiful handcrafted records on the Crimethinc label, the largest publisher of anarchist propaganda at the time. They played conferences, collectives, houses, and anti-globalization gatherings for about a decade before announcing a hiatus in the mid-2000s. What was billed as their last show was held in the linoleum-floored room of a church somewhere deep in Washington, D.C. after the National Conference of Organized Resistance (NCOR). The show turned out to be cathartic for those in attendance, the kids who were too young for Seattle who would later be too old for Occupy. The last song they played, a loud, exultant cover of Crosby, Stills, Nash & Young's "Ohio," left



most of the audience in tears, Neil Young's lyrics retrofitted to suit the schizoid Bush years: *Tin soldiers and Bush is coming / we're finally on our own.*

I heard that, after going on hiatus, the members each went on to do interesting things. The Nordic-looking lead singer became a farmer. The bassist moved to Amsterdam. The petite, ever-boyish guitarist (who always seemed like the quiet ringleader of the band) relocated to Stockholm to raise his son. In short, they each continued the struggle on their own terms.

Quiet little "Sleepwalkers" continued to haunt me. The keyboard-driven lullaby seemed like a premonition, a glimpse of what-will-come of the kind you get when reading Dostoevsky and can smell the inchoate class rage that would, 40 years later, boil over into revolution. The lyrics of the song came back to me all at once:

*I had a dream I walked the city in my sleep
and that I found my way home at last
and nothing could lead me there but the things that I believed
and in the end it was all I needed
to find my way back home*

•

The night before, I had attended the occupation of Times Square with a friend, a fellow veteran of the post-Seattle anti-globalization movement. Those were the acronym years of the FTAA, the GATT, the WTO, and the G20; also, the black mask, the affinity group, the pepper spray compound, and the class-action lawsuit. Since then, time had done its work. By tiny imperceptible degrees, we had transitioned from crusty, black-clad youth into reasonable *Harper's*-reading adults. But the experience with the movement informed our view of Occupy. It was disorienting to look out on all the angry teenagers and college students, drunk on their youth power and protesting the first time, none of them realizing that they were part of a lineage that stretched back to the beginning of time, each generation isolated and alone, getting older at their own speed; that they were just the latest model of youth that would soon be obsolete.

Afterward, hearing that a second occupation would be opening up, we ventured down to Washington Square Park. We entered the park and made our way into a General Assembly that was taking place in the drained-out basin of the central fountain. The facilitators of the General Assembly were all crowded up on an elevated stone circle at the fountain's center, like a hype crew at a hip-hop club. Hundreds of people fanned out in circles around them, listening and repeating their statements. The lit-up Washington Square arch framed the General Assembly meeting like a halo. There, late one night in 1917, Marcel Duchamp and a gang of friends had broken into the Arch and climbed to the top. They released red balloons, popped bottles of champagne, and declared Greenwich Village a "free and independent Republic."

Aesthetically, there was something a little too perfect about this next wave of 21st-century activists. Their pore-cleansed skin and expensive-looking, fashionable clothing. These perfect specimens of youth, brimming confidence in their historical mission, looked like they would fit in as well in an iPod commercial as in a riot.

My impression of the anti-globalization years was that we must have looked like demons, world-historical gargoyles, filthy and unshaven with sideways haircuts and wearing black, patched-up clothing covered in grease and dirt, looking like we'd just crawled out of some squat hovel to protest before mysteriously retreating back up into the eaves.

A lofty, new-age rhetoric carries the Washington Square Park General Assembly forward. The facilitators repeat words like "beautiful" and "history" over and over, searing the phrases into the minds of those who've gathered. *This moment is beautiful. This moment is history.* It's like a mantra. Later, when one woman says *This moment is pregnant with possibility* and the crowd repeats the phrase, a shudder passes through me, brought on by the truth of the statement. Donated pizzas are circulated throughout the crowd. My friend told





me that the Zuccotti Park occupiers get pizzas donated to them so often that the pizzeria around the corner has created a special pie named after them — “the Occu-pie.”

A constant problem for social struggles is that active participation is limited to those who have the time and energy to pursue it. There seems to have been a definitive generational rupture between the last generation and this one. The window-smashing black-blocker of 2003 is now the mellowed-out supporter of 2011, showing up at Zuccotti Park to drop off books and toothpaste. In the short time that had passed since the Bush years, nearly everyone I had known (myself included) had given up activism and receded into grad school, a family, or intellectual or cultural production. Most of us burrowed into art, music, and careers, only to re-emerge as reluctant Obama voters in 2008.

I remember well the sense of doomed futility in 2002, just months after 9/11, as we marched against the World Economic Forum in New York, knowing that the effect would be negligible. I remember one moment during the Miami Free Trade of the Americas protests in 2003. While running away from a phalanx of advancing police, an unmarked van had squealed to a stop in front of a guy who was running about 200 feet ahead of me. Police dressed like black-blockers jumped out, beat him up, and then threw him in the back of the van. His friend became hysterical and asked over and over where they had taken him. We didn't know what to tell her. The repression in those years was brutally effective. Everyone I know seemed to leave these protests with a feeling of subdued hopelessness, with a sense that none of it mattered. As a friend of mine from that time put it recently, “Now it feels like none of that stuff ever even happened.”

It should be noted that in terms of sheer numbers, the post-Seattle anti-globalization mobilizations between 2000 and 2007 tended to be larger than the Occupy events thus far. Why were those years so futile while Occupy has so easily caught on? As one of the organizers of Occupy, David Graeber, recounted in a conversation he had with an Egyptian activist named Dina:

'All these years,' she said, 'we've been organizing marches, rallies... And if only 45 people show up, you're depressed, if you get 300, you're happy. Then one day, 200,000 people show up. And you're incredulous: on some level, even though you didn't realize it, you'd given up thinking that you could actually win.'

To put it in PR terminology, the anti-globalization movement had a serious credibility problem. There was no way a movement that branded itself as fringe ultra-left and anti-American could ever attract average, pragmatic, family-minded Americans. At nearly every protest, some menacing-looking kid in black ritualistically broke a window and set something on fire. There were plenty of signs that said “Fuck America” and the mainstream media film crews usually clustered around the lone individual burning an American flag. It seemed as if the anarchists were usually concerned with the symbolic, militant portrayal of “an anarchist presence” rather than cooperating with other groups or making a real change. The anti-globalization movement basically just followed these international entities (the WTO, G20, IMF) around the globe and protested in any city where they had a closed-off meeting. This model was tactically inefficient and undermined credibility — the city leadership only had to cry “foreign anarchist agitators” and “conference-hopping activists” to justify a police crackdown.

Occupy seems to mark a significant evolution. It seems like the early-to-mid 2000s were like the grim, nihilistic, Narodnik late 1800s compared to the current populist 1905 moment. The anti-globalization movement possessed none of Occupy's non-violent patriotic sheen. Occupy is about starting where you are — building up a community and working on your home turf. Affinity groups are much more cautious than they were in the anti-globalization years. They sit down and discuss what they're going to do before they do it. Inclusion and a lengthy democratic process are emphasized. This is important because if the goal is democracy, then this has to be practiced throughout. As David Graeber put it in an interview with the *Chronicle of Higher Education*, “the ends and the means have to be the same.”

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New York's Financial District takes on an altogether different character at night. I find it bewitching to wander downtown streets in those quiet predawn hours when the brokers and marauding hedge fund managers have all gone home to Staten Island and Jersey. The narrow, labyrinthine streets are more Arthur Conan Doyle than Michael Lewis: storefronts shuttered, steam pouring from grates. You can almost feel the briny old New York rising up from beneath the cobblestones. You can sense the rhythmic waves beating against the Battery just a few blocks away. At Broadway, I turned South and headed toward the matte-black Death Star skyscraper that overlooks Zuccotti Park.

Framed by low clouds and the gap in the sky of the missing Trade Centers, the Occupy Wall Street tent city looked like Five Points reincarnated, the rough, rakish, homesteaders' New Amsterdam revenging itself on the sleek, technocratic future. The cops standing guard at the edges of the encampment had glazed-over eyes; they looked like bored teenagers forced to do something they don't want to do. A few scattered groups were awake, perched on the marbled benches throughout the park, sharing cigarettes and talking in whispers. Most were asleep. A huge Marine in stripped-down fatigues paced the perimeter of the square, chain-smoking. A young man with a fiddle and old-timey clothes played softly by the 24-hour concession trucks.

Adults have so few opportunities to watch large groups of people slumbering together. There was something deeply comforting about the experience — long-forgotten memories of a nursery, of a lock-in at church, sleeping bags strewn across slick polyurethane-coated floors. Bodies were rolled up in crinkly blue tarps or hidden in cardboard box castles, sprawling across the park in various states of improvised comfort. Most slept out in the open air on that perfect fall night, lined up in mummy sleeping bags, faces poking out, eyes closed. There was something mystically subversive about it all, as if they were spending the day in occupation, but were also all meeting each other again at night in the world of dreams. I found myself staring at a man as old as my grandfather asleep in a nylon sleeping bag. His face was thin and gaunt, hair shock white, skin wrinkled to leather. He looked like a cadaver. But he was smiling.

After circling the perimeter of the park a couple of times (and giving out the rest of my cigarettes), I realized there was an undeniably strange cosmic symmetry in the fact that the agglutination of human warmth and positive energy that is Occupy Wall Street had materialized just blocks away from the festering wound of negative energy that is Ground Zero.

People like to go to Occupy Wall Street because it is a tear in the commoditized social fabric of New York City. It just *feels good to be there*, as people say. Tourists snap pictures. Residents stop by after mimosas and brunch on Saturday afternoons. But mostly, people go down because they are lonely. The best place to go when you're lonely is the Temporary Autonomous Zone. You might see someone you know. You might have an interesting conversation with someone you don't. Normally frigid social relations are warmed up and people can interact with each other on an even playing field, without being dogged by hierarchy. It's like the YMCA of yore, the place to go when you're feeling down, where you can pick yourself of the ground. The sense of something bursting from the earth of Lower Manhattan, of something dead coming back to life. You too can come and bask in the warmth of the Commune. • 11 November 2011

Aaron Lake Smith is a writer from North Carolina who writes the fanzine Big Hands. His work has also appeared in Time, Vice, Newsweek, and n+1.

<http://www.thesmartset.com/article/article11101101.aspx>



Now Starting: A 60-Year Project To Build A Dome Using Living Trees



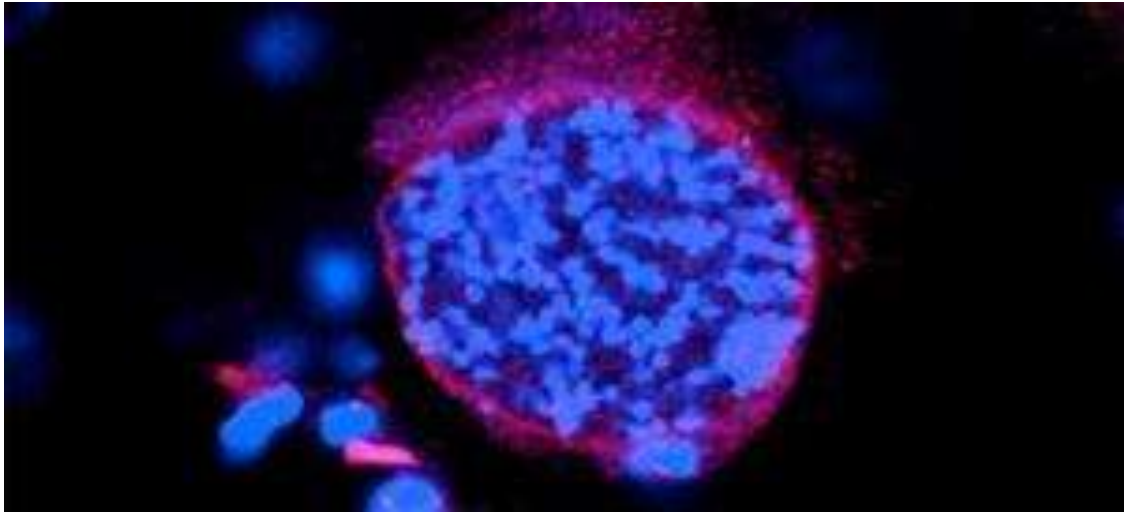
For a weeklong workshop, Visiondivision began an architecture project that will take 60 years to grow.

There's no question that technology has eroded our patience. Can you imagine waiting a full minute for your dial-up modem to connect to the internet today? In architecture terms, that's like waiting 60 years for a project to be completed. Which is exactly what the Stockholm-based studio Visiondivision has planned for the Politecnico di Milano campus: a canopy of trees that will take six decades--and a ginormous green thumb--to build. "If we can be patient with the building time, we can reduce the need for transportation, waste of material and different manufacturing processes, simply by helping nature grow in a more architectonic and useful way," the architects write on their website. During a weeklong workshop, they taught students the techniques--such as bending, braiding, pruning, and grafting--required to construct a study retreat, aptly called "The Patient Gardener," from only plants and trees.

The main structure is a dome of ten Japanese cherry trees, which are planted around a temporary tower that acts as a guide. Once the bent trees touch the tower, they will be redirected into an hourglass shape, the top of which will become a second level for reading and lounging and accessed by stairs of branches. The architects even devised furniture made from greenery, including a chair that seems to have organically sprung from the ground but is actually a cardboard form covered in soil and draped in grass. Visiondivision left behind instructions for future generations of gardeners. "In about 80 years from now," the architects write, "the Politecnico di Milano campus will have a fully grown building and the students will hopefully have proud grandchildren that can tell the story of the project for their friends and family." That's a far cry from the instant gratification we've come to expect; rather, it's the long view we need to take when measuring our impact on the planet.

<http://www.fastcodesign.com/1665381/now-starting-a-60-year-project-to-build-a-dome-using-living-trees>

Brain Parasite Directly Alters Brain Chemistry



Brain cyst. (Credit: Image courtesy of University of Leeds)

ScienceDaily (Nov. 4, 2011) — Research shows infection by the brain parasite *Toxoplasma gondii*, found in 10-20 per cent of the UK's population, directly affects the production of dopamine, a key chemical messenger in the brain.

Findings from the University of Leeds research group are the first to demonstrate that a parasite found in the brain of mammals can affect dopamine levels.

Whilst the work has been carried out with rodents, lead investigator Dr Glenn McConkey of the University's Faculty of Biological Sciences, believes that the findings could ultimately shed new light on treating human neurological disorders that are dopamine-related such as schizophrenia, attention deficit hyperactivity disorder, and Parkinson's disease.

This research may explain how these parasites, remarkably, manipulate rodents' behaviour for their own advantage. Infected mice and rats lose their innate fear of cats, increasing the chances of being caught and eaten, which enables the parasite to return to its main host to complete its life cycle.

In this study, funded by the Stanley Medical Research Institute and Dunhill Medical Trust, the research team found that the parasite causes production and release of many times the normal amount of dopamine in infected brain cells.

Dopamine is a natural chemical which relays messages in the brain controlling aspects of movement, cognition and behaviour. It helps control the brain's reward and pleasure centres and regulates emotional responses such as fear. The presence of a certain kind of dopamine receptor is also associated with sensation-seeking, whereas dopamine deficiency in humans results in Parkinson's disease.

These findings build on earlier studies in which Dr McConkey's group found that the parasite actually encodes the enzyme for producing dopamine in its genome.

"Based on these analyses, it was clear that *T. gondii* can orchestrate a significant increase in dopamine production in neural cells," says Dr McConkey.



"Humans are accidental hosts to *T. gondii* and the parasite could end up anywhere in the brain, so human symptoms of toxoplasmosis infection may depend on where parasite ends up. This may explain the observed statistical link between incidences of schizophrenia and toxoplasmosis infection."

Dr McConkey says his next experiments will investigate how the parasite enzyme triggers dopamine production and how this may change behaviour.

Toxoplasmosis, which is transmitted via cat faeces (found on unwashed vegetables) and raw or undercooked infected meat, is relatively common, with 10-20% of the UK population and 22% of the US population estimated to carry the parasite as cysts. Most people with the parasite are healthy, but for those who are immune-suppressed -- and particularly for pregnant women -- there are significant health risks that can occasionally be fatal.

The parasite infects the brain by forming a cyst within its cells and produces an enzyme called tyrosine hydroxylase, which is needed to make dopamine. Dopamine's role in mood, sociability, attention, motivation and sleep patterns are well documented and schizophrenia has long been associated with dopamine, which is the target of all current schizophrenia drugs on the market.

The enzyme tyrosine hydroxylase is a crucial step in making L-DOPA (prescribed as levodopa for Parkinson's Disease), a chemical that is readily converted to the neurotransmitter dopamine.

The US-based Stanley Medical Research Institute, which focuses on mental health conditions and has a particular emphasis on bipolar illnesses. Dunhill Medical Trust supports research on diseases of aging.

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.

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1. Emese Prandovszky, Elizabeth Gaskell, Heather Martin, J. P. Dubey, Joanne P. Webster, Glenn A. McConkey. **The Neurotropic Parasite *Toxoplasma Gondii* Increases Dopamine Metabolism.** *PLoS ONE*, 2011; 6 (9): e23866 DOI: [10.1371/journal.pone.0023866](https://doi.org/10.1371/journal.pone.0023866)

<http://www.sciencedaily.com/releases/2011/11/111104102125.htm>



CROWDS R US



After this summer's riots in England, crowd behaviour got a kicking. Ian Leslie argues that it was undeserved ...

From INTELLIGENT LIFE magazine, November/December 2011

Shortly after the popular uprising that led to the establishment of the Paris Commune in 1871, the politician Georges Clemenceau recalled witnessing a riot: "Suddenly a terrific noise broke out, and the mob which filled the courtyard burst into the street in the grip of some kind of frenzy...All were shrieking like wild beasts without realising what they were doing." For those who followed the English riots of 2011, the terms are familiar. On television, in newspapers and comment threads, the rioters were repeatedly likened to animals in the grip of a primitive frenzy, induced not by drink or drugs but by another culprit: the crowd.

Crowds, we are often told, are dumb. They obliterate reason, sentience and accountability, turning individuals into helpless copycats. Commentators on the riots offered different explanations but most agreed that crowd psychology was part of the problem. "The dominant trait of the crowd is to reduce its myriad individuals to a single, dysfunctional persona," wrote the novelist Will Self in the *New Statesman*. "The crowd is stupider than the averaging of its component minds." The violence was said to have spread like a "contagion" through the crowd, facilitated by social media. For those who wanted to sound scientific, the term to drop was "deindividuation": the loss of identity and moral responsibility that can occur in a group. But do crowds really make us more stupid?

Earlier this year, the world watched a crowd bring down an autocratic government, by the simple act of coming together in one place, day after day, night after night. Egyptian protesters created a micro-society in Tahrir Square, organising garbage collection, defending themselves when they needed to, but otherwise ensuring the protest remained peaceful. As well as courage, this took intelligence, discipline and restraint. Few international observers accused the crowd in Tahrir Square of being dysfunctional, or of turning its members into animals. The Tahrir protesters also used social media, but rather than calling for a ban, as some



in Britain did after the riots, people wrote eulogies to the liberating potential of Twitter. It seems that not all crowds are bad. But when bad things happen, the crowd gets the blame.

Consciously or otherwise, Self and others are echoing the French intellectual, and contemporary of Clemenceau, Gustave Le Bon. In 1896 Le Bon published the most influential book ever written about crowds, "The Crowd: A Study of the Popular Mind". "By the mere fact that he forms part of an organised crowd," Le Bon argued, "a man descends several rungs in the ladder of civilisation. Isolated, he may be a cultivated individual; in a crowd, he is a barbarian." Le Bon was the Malcolm Gladwell of his day, a populariser of scientific thought with an acute feel for the Zeitgeist. His equivalent of Gladwell's "tipping point" was "the law of the mental unity of crowds". It was a scientific-sounding articulation of an old idea: crowds have a mind of their own, under which individuality is submerged and rationality destroyed.

Le Bon's book hit a cultural nerve: a phrase of his, the "era of crowds", stuck to the late 19th century. Europe's cities had grown and industrialised fast, creating a vast and unruly class of people who had a nasty habit of coming together in public places to demand things. In Paris riots had threatened and sometimes overturned the established order for the last hundred years. Le Bon was a conservative, distrustful of fashionable democratic ideas. Like other members of the French middle class, when he saw a crowd he smelt only trouble. It's hardly surprising that he would characterise the people in them as sub-human.

What is surprising is that we seem to have inherited his prejudices. John Drury, a psychologist at Sussex university who studies crowd behaviour, believes that the idea that crowds induce irrational behaviour and erase individuality just isn't supported by the evidence. First, most crowds aren't violent. The crowd in the shopping mall or at a music festival is usually calm and ordered. Even crowds that include conflicting groups, as at football matches, are more likely to be peaceful than not. Second, even when crowds do turn violent, they aren't necessarily irrational. In the 18th century England was afflicted by food riots. If ever there was an atavistic reason to riot, that was surely it. But the historian E.P. Thompson showed that the riots took place not when food was at its most scarce but when people saw merchants selling grain at a steep profit; the rioters were motivated by a rational sense of injustice rather than the "animal" drive of hunger.

The Le Bon way of thinking about crowds matches the popular perception of crowd disasters, too—we tend to assume the worst of those involved. The people of Liverpool have spent years correcting the unfounded characterisation of those involved in the Hillsborough disaster as mindless thugs. In 1979, at a concert in Cincinnati headlined by The Who, 11 people were crushed to death as fans lined up to enter the stadium. The press described a "surging, primitive mob" comprised of "barbarians" and quoted a security guard who said, "These kids were acting like animals." But a subsequent study based on other eyewitness interviews found that, rather than engaging in a crazed stampede to get the best seats, crowd members had attempted to help each other escape the crush as soon as they realised it was happening. In fact, the problem in such situations is almost always one of physics, rather than morality; a little pushing can create shock waves that ripple through a crowd, exerting ferocious pressure on those unfortunate enough to be caught in the most tightly packed areas or up against a hard object, like the Who fans closest to the locked doors, or the Liverpool supporters nearest the barrier.

Crowds can change the way people behave. There is a difference between what you might call an accidental crowd, as in a railway station, and an organised crowd: people brought together by a shared purpose—supporting a team, overthrowing a despot. Being a part of such a crowd can lead you to do things you wouldn't normally do and might even disapprove of in normal circumstances: chant, swear at a referee, bellow the chorus to Robbie Williams's "Angels". But that's not to say that the persona you adopt in this context isn't "you" or that it's irrational to take part in crowd rituals (in a crowd of Barcelona supporters, the irrational thing to do would be to cheer on Real Madrid). When an accountant plays air guitar at a concert, he isn't giving up his identity so much as finding a neglected corner of it. Above all, he is enjoying the glorious sensation of feeling part of something bigger than himself.





An accidental crowd can become an organised one in response to an external threat. Passengers on the Piccadilly line who left King's Cross at 8.50am on July 7th 2005 would have felt little in common with each other, bar the tetchiness of the commuter. But when the carriage exploded and the survivors realised they had been attacked, they performed heroic acts to save the lives of strangers they had just been ignoring. The Tahrir Square crowd included supporters from Cairo's leading soccer teams, Al-Ahly and Al-Zamalek. The two groups have a longstanding post-match tradition of vicious fighting. Yet in Tahrir Square they stood together against Mubarak's thugs. Crowds are as likely to bring out the best in us as the worst.

Ian Leslie juggles two careers: advertising and writing. His most recent book is "Born Liars". His last piece for More Intelligent Life was "[Are artists liars?](#)"

Picture credit: [Lorianne DiSabato](#) (via [Flickr](#))

<http://moreintelligentlife.com/content/ideas/ian-leslie/crowds>



Tropical Forests Fertilized by Nitrogen Air Pollution, Scientists Find



Tropical forest in Panama. (Credit: iStockphoto/Alfredo Maiquez)

ScienceDaily (Nov. 3, 2011) — Scientists braved ticks and a tiger to discover how human activities have perturbed the nitrogen cycle in tropical forests. Studies at two remote Smithsonian Institution Global Earth Observatory sites in Panama and Thailand show the first evidence of long-term effects of nitrogen pollution in tropical trees.

"Air pollution is fertilizing tropical forests with one of the most important nutrients for growth," said S. Joseph Wright, staff scientist at the Smithsonian Tropical Research Institute in Panama. "We compared nitrogen in leaves from dried specimens collected in 1968 with nitrogen in samples of new leaves collected in 2007. Leaf nitrogen concentration and the proportion of heavy to light nitrogen isotopes increased in the last 40 years, just as they did in another experiment when we applied fertilizer to the forest floor."

Nitrogen is an element created in stars under high temperatures and pressures. Under normal conditions, it is a colorless, odorless gas that does not readily react with other substances. Air consists of more than 75% nitrogen. But nitrogen also plays a big role in life as an essential component of proteins. When nitrogen gas is zapped by lightning, or absorbed by soil bacteria called "nitrogen fixers," it is converted into other "active" forms that can be used by animals and plants. Humans fix nitrogen by the Haber process, which converts nitrogen gas into ammonia -- now a principal ingredient in fertilizers. Today, nitrogen fixation by humans has approximately doubled the amount of reactive nitrogen emitted.



Nitrogen comes in two forms or isotopes: atoms that have the same number of protons but different numbers of neutrons. In the case of nitrogen, the isotopes are ^{14}N and ^{15}N , although only about one in 300 nitrogen atoms is the heavier form. Imagine nitrogen in the ecosystem like a bowl of popcorn. Normally the ratio of popped (light) to unpopped (heavy) kernels stays the same, but when someone starts to eat the popcorn, the lighter, popped kernels get used up first, increasing the ratio of heavy to light kernels (or $^{15}\text{N}/^{14}\text{N}$ in the case of the ecosystem). Light nitrogen is lost through nitrate leaching and as gases such as N_2 , and various forms of nitrous oxides or "noxides," some of which can be important greenhouse gases. In the fertilization study in Panama, mentioned earlier, N_2O emissions were tripled.

"Tree rings provide a handy timeline for measuring changes in wood nitrogen content," said Peter Hietz from the Institute of Botany at the University of Natural Resources and Life Sciences in Vienna, who faced down a tiger when sampling trees in a monsoon forest on the Thailand-Myanmar border. "We find that over the last century, there's an increase in the heavier form of nitrogen over the lighter form, which tells us that there is more nitrogen going into this system and higher losses. We also got the same result in an earlier study of tree rings in Brazilian rainforests, so it looks like nitrogen fixed by humans now affects some of the most remote areas in the world."

"The results have a number of important implications," said Ben Turner, staff scientist at STRI. "The most obvious is for trees in the bean family (Fabaceae), a major group in tropical forests that fix their own nitrogen in association with soil bacteria. Increased nitrogen from outside could take away their competitive advantage and make them less common, changing the composition of tree communities."

"There are also implications for global change models, which are beginning to include nitrogen availability as a factor affecting the response of plants to increasing atmospheric carbon dioxide concentrations," said Turner. "Most models assume that higher nitrogen equals more plant growth, which would remove carbon from the atmosphere and offset future warming. However a challenge for the models is that there is no evidence that trees are growing faster in Panama, despite the long-term increases in nitrogen deposition and atmospheric carbon dioxide."

Decades of atmospheric nitrogen deposition have caused major changes in the plants and soils of temperate forests in the U.S. and Europe. Whether tropical forests will face similar consequences is an important question for future research.

Story Source:

The above story is reprinted from materials provided by **Smithsonian Tropical Research Institute**.

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

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The Rise of the Megacity

Jakarta, Lagos, and Sao Paulo, and other massive population centers are changing the way we think about cities.

By [David Pilling](#) Posted Saturday, Nov. 5, 2011, at 7:46 AM ET



Jakarta, one of the megacities that are challenging how we handle population growth

AFP/Getty Images.

At festival times, the locals don sandals and cotton indigo happi coats before heaving the neighbourhood deity through the streets on an ornate palanquin. At harvest, they gather to pound rice cakes. Even in non-festival times, there is a sense of community. Traders call out in a sing-song voice, enticing customers into their tiny shops to buy fresh fish, homemade tofu, miso or traditional sweets. Yet this is not some out-of-the-way village or coastal town. This is a fairly typical residential street in Tokyo, the world's biggest city – a megacity, no less, with a population of some 36m people.

The character of cities – and their larger cousins the megacities – is being rapidly redefined. We can no longer look at cities primarily through a European or North American lens. The great experiment in urbanisation that was played out in the advanced economies in the 19th and 20th centuries has shifted to the developing world, increasingly to Asia.

The biggest Asian cities, from Beijing to Jakarta and from Mumbai to Manila, have an entirely different feel from Tokyo. Most are poorer, grimmer and lacking in Tokyo's stupendous public transport. But they share with the Japanese capital, and some of the great conurbations of other continents, such as Lagos or São Paulo, a role in reshaping the definition of what a city means.

Advertisement



“Cities are simply no longer recognisable,” says David d’Heilly, who is writing a book on Tokyo as megacity. “They used to be the populated areas around religious institutions or seats of political power. These days they’re whatever an infrastructure can support.”

Many of those rushing from the countryside – at the rate of 45m people a year in Asia alone – are drawn to megacities, usually defined as those with more than 10m people. Edward Glaeser, an economics professor at Harvard, calls them “cities on steroids”.

The idea of a megacity derives from “megalopolis”, a pejorative term coined in 1918 by Oswald Spengler, the German historian. He was describing cities that had grown too large and were edging towards decline. Jean Gottmann, a French geographer, used the term more positively in the 1950s to refer to the metropolitan corridor along America’s eastern seaboard. Now, the concept has changed again to mean massive agglomerations, mostly in the developing world.

In truth, more of the world’s population is moving to second-tier cities than to the megacities. But huge conurbations have a symbolic potency. For some, they represent a brave new world in which Chinese, Indians, Brazilians and others in the developing world are clambering from poverty. For others, the megacity is nothing less than a nightmare.

The urban shift of humanity, whose number topped 7bn in October, is inexorable. In 2008, for the first time in human history, more people were living in cities than in the countryside. By this measure, Asia, where only 40 per cent of people are urban, is behind. Much of Asia’s city-building lies ahead.

In 1975, according to National Geographic, there were just three megacities. One was New York, commercial capital of the world’s greatest economic power. Another was Mexico City, a byword for the degradation of the developing world, where people crowded into filthy slums despoiled by pollution, violence and disease. The third was Tokyo, a city that had been one of the biggest in the world, with a population of 1m, at the end of the 18th century, when it was called Edo. Tokyo’s population exploded after the war as Japan surged towards western living standards. It became a new kind of city, neither western nor poor – the New York of Asia.

Thirty-five years later, those three cities have been joined by perhaps 20 new megacities. Definitions are hazy and controversial. Tokyo’s 23 wards are home to 12m people. But the greater Tokyo conglomeration, which spills into Kawasaki and Yokohama, comprises roughly 36m souls. Population sizes should not be taken too literally. Chongqing in western China officially has 30m people partly because farmers in surrounding areas are classified as belonging to the city.

McKinsey counts one megacity in Europe (London), three in Africa (Kinshasa, Lagos and Cairo), and five in the Americas (São Paulo, Mexico City, New York, Los Angeles and Buenos Aires). That leaves 11 in Asia, seven of which (Tokyo, Mumbai, Shanghai, Beijing, Delhi, Kolkata and Dhaka) occupy the top seven global spots.

Megacities are not easy to count. They are even harder to classify. Take Shanghai and Mumbai, the commercial capitals of China and India respectively. If you ignore the pollution and don’t stray too far off the main thoroughfares, Shanghai might remind you of New York. Indeed, by some measures it has surpassed that great American city. In 1980, Shanghai had just 121 buildings over eight storeys tall, according to D’Heilly. By 2005, it had more than 10,000. Shanghai boasts 91 skyscrapers more than 200m tall, trumping New York’s 82. Since 1995, it has built the world’s longest metro system, and plans to double it again by 2020.



Compare Shanghai – planned, vertical and (sometimes) gleaming – with Mumbai, unplanned, low-rise and mostly filthy. Still, India’s “Maximum City”, the title of a thrilling portrayal by Suketu Mehta, somehow manages to retain its glamour. For millions of Indians it offers the hope of a better life and escape from the drudgery of the countryside. Building regulations mean Mumbai has few skyscrapers. Rather than living in high-rise towers, many crowd into tiny spaces in slums like Dharavi.

Mumbai has no metro system, though one is being built. Its railway, which transports the equivalent of the population of Israel every day, is so hazardous that hundreds are killed each year. Yet the city somehow functions. To take just one example, its tiffin-carrying *dabbawalas* supply millions of lunches – for Muslims, Hindus, vegetarians and meat-eaters – in a feat of supply-chain management that has consultants swooning.

Gil-Hong Kim, an infrastructure expert at the Asian Development Bank, says that, to be successful, cities need leaders capable of implementing a vision. In 1970, nearly one-third of people in Seoul lived in squatter settlements. Thanks to careful land-use planning – supplemented by brutal use of the bulldozer – the city has been transformed. Now with a population of 24.5m, it is a mostly pleasant and prosperous city with the world’s third-biggest metro system by passenger numbers.

That’s the exception. The way most cities are run has not caught up with reality. According to McKinsey, more than one-fifth of the world’s population live in just 600 cities, which together generate half of global output. Yet many of these have little sway over their own budgets, planning or policy. Fauzi Bowo, governor of Jakarta, complained at an FT/World Bank conference in Singapore that he had to beg the national government for funds. “By 2025, 60 per cent of Indonesians will live in cities, but how can we cope if we are not given adequate authority and sources of funding?”

Many cities in Asia have little ability to tax their inhabitants or to charge them for water or electricity, let alone to provide the sewerage, roads and public transport that might improve life. We still think in terms of the nation state. But the world’s people have moved to cities, many of them administratively powerless.

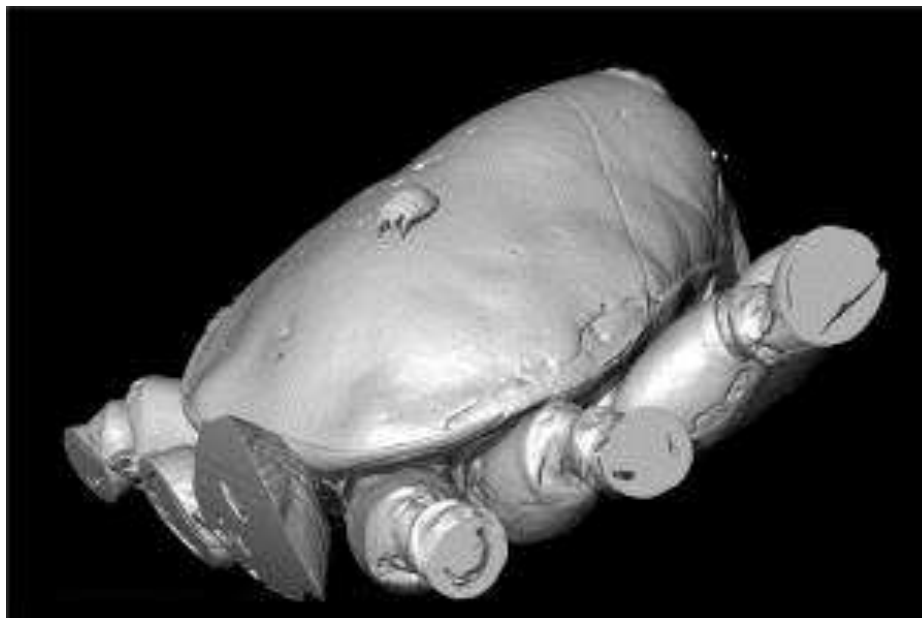
Clearly, there are huge problems associated with living an ever-more urban existence, not least the environmental impact. A middle-class Shanghainese consumes far more resources and generates far more greenhouse gases than a farmer in Anhui province. Yet, as Glaeser argues forcefully in *Triumph of the City*, cities are at the apex of human endeavour. High-density cities are creative, thrilling and less environmentally destructive than sprawling car-based suburbs typical of America. Cities are passports from poverty. They attract poor people, rather than creating them. They are where humans are at their most artistically and technologically creative.

Whether we like it or not, it is no longer possible to keep the bulk of humanity down on the farm. By 2050, three-quarters of the world’s population will be urban. That means more cities – and more megacities. “These megacities are a big part of humanity’s future and the prospect should be both exhilarating and terrifying,” says Glaeser. The examples of Tokyo, Seoul and Shanghai show that megacities don’t have to be monstrosities. For many of us, the megacity is our fate. The goal of humanity should be to manage that fate, not succumb to it.

This article originally appeared in Financial Times. Click [here](#) to read more coverage from the Weekend FT.

http://www.slate.com/articles/life/ft/2011/11/the_rise_of_the_megacity_single.html

Hi-Tech Scans Catch Prehistoric Mite Hitching Ride On Spider



Prehistoric mite hitching a ride on 50-million-year-old spider as revealed by CT scanning technology. (Credit: Image courtesy of Manchester University)

ScienceDaily (Nov. 8, 2011) — Scientists at the University of Manchester colleagues in Berlin believe have produced amazing three-dimensional images of a prehistoric mite as it hitched a ride on the back of a 50-million-year-old spider.

At just 176 micrometres long and barely visible to the naked eye, the mite -- trapped inside Baltic amber (fossil tree resin) -- is believed to be the smallest arthropod fossil ever to be scanned using X-ray computed tomography (CT) scanning techniques.

The study, published in the Royal Society journal *Biology Letters*, also sets a minimum age of almost 50 million years for the evolution among these mites of phoretic, or hitchhiking, behaviour using another animal species.

"CT allowed us to digitally dissect the mite off the spider in order to reveal the important features on the underside of the mite required for identification," said Dr David Penney, one of the study's authors based in the Faculty of Life Sciences. "The specimen, which is extremely rare in the fossil record, is potentially the oldest record of the living family Histiostomatidae.

"Amber is a remarkable repository of ecological associations within the fossil record. In many cases organisms died instantaneously and were preserved with lifelike fidelity, still enacting their behaviour immediately prior to their unexpected demise. We often refer to this as 'frozen behaviour' or palaeoethology and such examples can tell us a great deal about interactions in ecosystems of the past. However, most amber fossils consist of individual insects or several insects together but without unequivocal demonstrable evidence of direct interaction. The remarkable specimen we describe in this paper is the kind of find that occurs only once in say a hundred thousand specimens."



Fellow Manchester biologist Dr Richard Preziosi said: "Phoresy is where one organism uses another animal of a different species for transportation to a new environment. Such behaviour is common in several different groups today. The study of fossils such as the one we described can provide important clues as to how far back in geological time such behaviours evolved. The fact that we now have technology that was unavailable just a few years ago means we can now use a multidisciplinary approach to extract the most information possible from such tiny and awkwardly positioned fossils, which previously would have yielded little or no substantial scientific data."

Co-author Professor Phil Withers, from Manchester's School of Materials, said: "We believe this to be the smallest amber inclusion scanned anywhere to date. With our sub-micron phase contrast system we can obtain fantastic 3D images and compete with synchrotron x-ray systems and are revealing fossils previously inaccessible to imaging. With our nanoCT lab systems, we are now looking to push the boundaries of this technique yet further."

Dr Jason Dunlop, from the Humboldt University, Berlin, added: "As everyone knows, mites are usually very small animals, and even living ones are difficult to work with. Fossil mites are especially rare and the particular group to which this remarkable new amber specimen belongs has only been found a handful of times in the fossil record. Yet thanks to these new techniques, we could identify numerous important features as if we were looking at a modern animal under the scanning electron microscope. Work like this is breaking down the barriers between palaeontology and zoology even further."

Story Source:

The above story is reprinted from [materials](#) provided by [Manchester University](#).

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

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The Kyoto Accords — and Hope — Are Expiring

By [Bryan Walsh](#) Tuesday, Nov. 08, 2011



Smoke billows from a chemical factory in the Chinese city of Nanjing. China is an engine of both global economic growth and new carbon emissions for the past 15 years

There's one absolutely foolproof way to cut carbon emissions: economic collapse. After the fall of communism in the early 1990s led to economic depression in much of Eastern Europe and the former Soviet Union, carbon output in those countries fell like a stone. In fact, greenhouse-gas emissions in Russia didn't return to 1990 levels until well into the 21st century. It's no secret why: as long as most of our energy comes from fossil fuels, economic growth will generally be linked to emissions growth.

That's why — for environmentalists at least — the great economic crash of 2008 contained a flicker of good news, with reduced carbon output providing a brief breather that could give the international community a chance to come up with a meaningful path to a lower-carbon economy. Even better, this was happening just in time for the big U.N. climate summit in Copenhagen at the end of 2009. ([See who's bankrolling the climate-change deniers.](#))

Of course, things didn't exactly work out. Just about all the Copenhagen attendees got was frostbite from standing out in the cold, waiting to get into the overcrowded conference center — and we're now paying the price for that lack of results. A new report released by the Oak Ridge National Laboratory shows that we've already blown through our climate time-out, with global carbon emissions jumping by a record 564 million tons in 2010 from 2009. That's an increase of 6%. Just in case that single-digit increase sounds small, consider that 564 million tons is greater than the individual emissions of all but three countries: the U.S., China and India. This is actually worse than the worst-case scenario put forward by energy experts just four years ago.



All of this is backdrop to the annual U.N. climate-change summit, which begins at the end of the month in the South African city of Durban. The yearly confabs have grown a lot quieter since Copenhagen, as both attendance and expectations for meaningful global action shrank. But this year's meeting is more notable than most: 2012 marks the official end of the Kyoto Protocol, which required developed nations that ratified the deal to cut their carbon emissions by an average of 8% below 1990 levels. Right now there is very little indication that the world will be able to come up with any deal to follow up Kyoto when it expires.

It's not that the Kyoto Protocol hasn't been followed; the developed nations that ratified the deal have largely been able to make the required cuts. But Kyoto, of course, never included the U.S. — which signed the agreement in 1997 but didn't ratify it. More importantly, it excluded developing countries as well. That includes India and China — the engines of both global economic growth and new carbon emissions for the past 15 years. (See how climate change may shrink species.)

Indeed, developing nations as a group now account for more than 50% of global greenhouse-gas emissions. That's why an extension of the Kyoto Protocol as it's currently formulated — which is what the developing world wants — would do little to slow the pace of warming. For its part, the U.S. has called on developing nations like China to accept mandatory action on carbon emissions, but given the total political paralysis in Washington on climate, that looks more than a little hypocritical. All in all, it's a formula for another year of good intentions at best, disingenuous posturing at worst, and zero results on the international stage, even as carbon keeps rising and the earth keeps warming.

Why, at a moment when nearly every government accepts that climate change is a threat, are we actually going backward? There's no shortage of groups to blame: the fossil-fuel lobby, the global-warming-is-a-hoax wing nuts, the compliant media, the Exxon tiger. I wish I knew. But the reality is that the problem of decarbonizing is much, much harder than we thought it was — and getting harder every day. No matter how brightly the climate warning lights flash red, after all, unemployment in the U.S. still sits at 9% and Europe is in even greater economic turmoil. We need growth to get people employed, and in that environment, emissions control look like a luxury.

There's been a lot of talk recently that the world is finally facing an economic reckoning — a final past-due bill for those years of living so far beyond our means. The truth is we're facing a climate reckoning as well. The two are fatally intertwined — and they're going to be impossible to solve separately, if they can be solved at all.

Read more: <http://www.time.com/time/health/article/0,8599,2098887,00.html#ixzz1dL0rX7Ep>

<http://www.time.com/time/health/article/0,8599,2098887,00.html>



Ancient DNA Provides New Insights Into Cave Paintings of Horses



Horses from the Hillaire Chamber, Chauvet Cave. (Credit: Photo courtesy of the French Ministry of Culture and Communication, Regional Direction for Cultural Affairs, Rhône-Alpes region, Regional Department of Archeology)

ScienceDaily (Nov. 7, 2011) — An international team of researchers has used ancient DNA to shed new light on the realism of horses depicted in prehistoric cave paintings.

The team, which includes researchers from the University of York, has found that all the colour variations seen in Paleolithic cave paintings -- including distinctive 'leopard' spotting -- existed in pre-domestic horse populations, lending weight to the argument that the artists were reflecting their natural environment.

The study, published in *Proceedings of the National Academy of Sciences (PNAS)*, is also the first to produce evidence for white spotted phenotypes in pre-domestic horses. Previous ancient DNA studies have only produced evidence for bay and black horses.

Archaeologists have long debated whether works of art from the Paleolithic period, particularly cave paintings, are reflections of the natural environment or have deeper abstract or symbolic meanings.

This is particularly true of the cave painting "The Dappled Horses of Pech-Merle" in France, which dates back more than 25,000 years and clearly depicts white horses with dark spots.

The dappled horses' spotted coat pattern bears a strong resemblance to a pattern known as 'leopard' in modern horses. However, as some researchers believed a spotted coat phenotype unlikely at this time, pre-historians have often argued for more complex explanations, suggesting the spotted pattern was in some way symbolic or abstract.

Researchers from the UK, Germany, USA, Spain, Russia and Mexico genotyped and analysed nine coat-colour loci in 31 pre-domestic horses dating back as far as 35,000 years ago from Siberia, Eastern and Western Europe and the Iberian Peninsula. This involved analysing bones and teeth specimens from 15 locations.

They found that four Pleistocene and two Copper Age samples from Western and Eastern Europe shared a gene associated with leopard spotting, providing the first evidence that spotted horses existed at this time.

In addition, 18 horses had a bay coat colour and seven were black, meaning that all colour phenotypes distinguishable in cave paintings -- bay, black and spotted -- existed in pre-domestic horse populations.

Professor Michi Hofreiter, from the Department of Biology at the University of York, said: "Our results suggest that, at least for wild horses, Paleolithic cave paintings, including the remarkable depictions of spotted horses, were closely rooted in the real-life appearance of animals.

"While previous DNA studies have produced evidence for bay and black horses, our study has demonstrated that the leopard complex spotting phenotype was also already present in ancient horses and was accurately depicted by their human contemporaries nearly 25,000 years ago.

"Our findings lend support to hypotheses that argue that cave paintings constitute reflections of the natural environment of humans at the time and may contain less of a symbolic or transcendental connotation than often assumed."

The data and laboratory work were led by Dr Melanie Pruvost, from the Department of Evolutionary Genetics at the Leibniz Institute for Zoo and Wildlife Research and the Department of Natural Sciences at the German Archaeological Institute, both in Berlin. The results were replicated in laboratories at the University of York.

Dr Pruvost said: "We are just starting to have the genetic tools to access the appearance of past animals and there are still a lot of question marks and phenotypes for which the genetic process has not yet been described. However, we can already see that this kind of study will greatly improve our knowledge about the past. Knowing that leopard spotting horses were present during the Pleistocene in Europe provides new arguments or insights for archaeologists to interpret cave arts."

Dr Arne Ludwig, from the Leibniz Institute for Zoo and Wildlife Research in Berlin, added: "Although taken as a whole, images of horses are often quite rudimentary in their execution, some detailed representations, from both Western Europe and the Ural mountains, are realistic enough to at least potentially represent the actual appearance of the animals when alive.

"In these cases, attributes of coat colours may also have been depicted with deliberate naturalism, emphasizing colours or patterns that characterised contemporary horses."

Exact numbers of Upper Paleolithic sites with animal depictions are uncertain because of ongoing debates about the taxonomic identification of some images and dating. However, art of this period has been identified in at least 40 sites in the Dordogne-Périgord region, a similar number in coastal Cantabria and around a dozen sites in both the Ardèche and Ariège regions.

Where animal species can be confidently identified, horses are depicted at the majority of these sites.

Professor Terry O'Connor from the University of York's Department of Archaeology was involved in the interpretation of the results. He said: "Representations of animals from the Paleolithic period have the potential to provide first-hand insights into the physical environment that humans encountered thousands of



years ago. However, the motivation behind, and therefore the degree of realism in these depictions is hotly debated.

"The depictions of horses at Pech-Merle in particular have generated a great deal of debate. The spotted horses are featured in a frieze which includes hand outlines and abstract patterns of spots. The juxtaposition of elements has raised the question of whether the spotted pattern is in some way symbolic or abstract, especially since many researchers considered a spotted coat phenotype unlikely for Paleolithic horses.

"However, our research removes the need for any symbolic explanation of the horses. People drew what they saw, and that gives us greater confidence in understanding Paleolithic depictions of other species as naturalistic illustrations."

Leopard complex spotting in modern horses is characterised by white spotting patterns that range from horses having a few white spots on the rump to horses that are almost completely white. The white area of these horses can also have pigmented oval spots known as 'leopard spots'.

Dr. Monika Reissmann, from Humboldt University's Department for Crop and Animal Sciences, explained: "This phenotype was in great demand during the Baroque Age. But in the following centuries the leopard complex phenotype went out of fashion and became very rare. Today leopard complex is a popular phenotype in several horse breeds including Knabstrupper, Appaloosa and Noriker and breeding efforts have intensified again because there is a growing interest in the restoration of these horses."

The fact that four out of 10 of the Western European horses from the Pleistocene had a genotype indicative of the leopard complex phenotype, suggests that this phenotype was not rare in Western Europe during this period.

However, bay seems to have been the most common colour phenotype in pre-domestic times with 18 out of the 31 samples having bay genotypes. This is also the most commonly painted phenotype in the Paleolithic period.

Story Source:

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7 Steps For Creating Disruptive New Retail Experiences

Why are people willing to pay \$4 for coffee at Starbucks and clog Apple stores to play with electronic gadgets? Both companies reinvented the retail experience.



Have you wondered why we linger in an Apple store, playing with shiny screens, but never set foot in a Sony Style store (which, incidentally, has its devices locked behind glass doors)? Why are one company's stores a multi-billion dollar business while the other doesn't even show up in their annual report?

The difference is that Apple has created something very different from the cold, "hands-off" nature of traditional high-end stores, while avoiding the clutter of a warehouse store like Best Buy. In sociological terms, Apple has very deliberately changed the "script" of electronics shopping.

What do we mean by "scripts"? Sociologists have spent years studying experiences and have noticed that there are shared rules that govern how we act. These scripts are unwritten and unspoken, yet greatly influence our day-to-day behaviors and interactions.

Scripts are why we know what to do when we go to the DMV. Unfortunately for the DMV, that script includes complaining to the people in line with us, expecting a bad photo to be taken, and talking afterward about how inefficient the process was. On the other hand, a birthday party is supposed to be a happy experience. We appropriately sing and smile, often in spite of how much is on our minds.

In the mundane routines of our lives, experiences that stand out are often those that change the existing scripts. Mini Cooper, for example, replaced the "cheap small car" script with one that leverages the fun aspects of driving a rally car.

To truly design a great experience that's right for your company, we need to look beyond the field of design to sociology, economics, organizational behavior, and even theater. These seven principles will help you be strategic about the experiences you design and choose the right script for your company.



1. Experience design is not about luxury.

As soon as the conversation turns to design and customer-centered activities, the knee-jerk reaction is to cast the product as a “premium” idea. The truth is that customer experience can be central to even “value-based” businesses. Consider Southwest Airlines. At its best, the combination of heart, humor, and efficiency makes for a distinctly Southwest script for air travel that’s different from the norm.

2. Start with empathy.

Understanding and challenging social scripts requires stepping into your customers’ shoes. Harley-Davidson has a strong community of riders as brand ambassadors precisely because its employees are the kinds of people who equate biking with life and freedom, and regularly hit the open roads.

3. Do your own thing.

Find authentic sources of connection with your customers and stick to them. People will value originality as long as you continue to serve their needs. Target was a discount retailer trying to outdo Walmart on price before it realized it could create a destination for the design-minded community, providing a lot more value.

4. Utilize all elements of theater.

Create an immersive world with consistent rules. To reinforce the script, think of the whole experience as a “play,” including the cast, costumes, set, and props. Starbucks employs all of these elements in their coffee-shop experience-- everything from the interior design to the names of the drinks are considered in delivering the experience Howard Schultz envisioned when popularizing the “coffee-shop” script in the U.S.

5. Use different incentives to create different behaviors.

Align your people, including their incentives and motivations, with the desired experience. Saturn changed the car-buying script in the 1980s by employing salaried salespeople--and eliminating a stereotype of the sleazy car salesman who’s after commissions.

6. The devil is in the trade-offs.

The experience you offer should have a clear point of view. What you leave out often says more than what you leave in. Chipotle refuses to use freezers, in the fast food industry no less. And Whole Foods won’t accept over-processed foods in its aisles. Managing trade-offs tightly is essential to creating a script with a character that inspires people and separates a brand from the pack.

7. Evolve to stay relevant.

Never stop prototyping and testing changes to make the experience better and to change in step with people’s needs. McDonald’s has proved surprisingly resilient through market ups and downs. It constantly experiments with its experience at its Innovation Center in Illinois, making sure new elements--like its wildly successful coffee offerings--support and augment its business goals.

Designing great experiences is a blind spot for many corporate leaders. It’s an area of expertise that needs just as much attention, rigor, and patience as the other aspects of business excellence taught in our B-schools. And with folks like Apple raising the stakes, ignore it at your own peril.





Kingshuk Das is an experienced innovation program leader who thrives at the intersection of business strategy, social research, and design methodologies. He has taught design strategy courses at Stanford University, and worked at both large companies and leading consultancies to help organizations create new markets through novel offerings and processes. He speaks at international events on the challenge of innovation within traditional organizations, including at CNBC, Stanford University GSB, and the Freedom From Corruption Conference in India. Kingshuk holds a bachelor's degree in architecture from the Birla Institute of Technology in India and a Master's degree in strategic design planning from the Illinois Institute of Technology, Chicago.

<http://www.fastcodesign.com/1665344/7-steps-for-creating-disruptive-new-retail-experiences>



Sea Life 'Must Swim Faster to Survive' to Survive Climate Change

In a new study, scientists warn that fish and other sea creatures will have to travel large distances to survive climate change. (Credit: © Mark Doherty / Fotolia)

ScienceDaily (Nov. 7, 2011) — Fish and other sea creatures will have to travel large distances to survive climate change, international marine scientists have warned.

Sea life, particularly in the Indian Ocean, the Western and Eastern Pacific and the subarctic oceans will face growing pressures to adapt or relocate to escape extinction, according to a new study by an international team of scientists published in the journal *Science*.

"Our research shows that species which cannot adapt to the increasingly warm waters they will encounter under climate change will have to swim farther and faster to find a new home," says team member Professor John Pandolfi of the ARC Centre of Excellence for Coral Reef Studies and The University of Queensland.

Using 50 years' data of global temperature changes since the 1960s, the researchers analysed the shifting climates and seasonal patterns on land and in the oceans to understand how this will affect life in both over the coming century.

"We examined the velocity of climate change (the geographic shifts of temperature bands over time) and the shift in seasonal temperatures for both land and sea. We found both measures were higher for the ocean at certain latitudes than on land, despite the fact that the oceans tend to warm more slowly than air over the land."

The finding has serious implications especially for marine biodiversity hotspots -- such as the famous Coral Triangle and reefs that flourish in equatorial seas, and for life in polar seas, which will come under rising pressure from other species moving in, the team says.

"Unlike land-dwelling animals, which can just move up a mountain to find a cooler place to live, a sea creature may have to migrate several hundred kilometres to find a new home where the water temperature, seasonal conditions and food supply all suit it," Prof. Pandolfi says.

Under current global warming, land animals and plants are migrating polewards at a rate of about 6 kilometres a decade -- but sea creatures may have to move several times faster to keep in touch with the water temperature and conditions that best suit them. Team member Associate Professor Anthony Richardson from the School of Mathematics and Physics at the University of Queensland became interested in how species might respond to climate change during his work on a global synthesis of marine climate impacts.





He says, "We have been underestimating the likely impact of climate change on the oceans." As a general rule, it seems sea life will have to move a lot faster and farther to keep up with temperature shifts in the oceans. This applies especially to fish and marine animals living in the equatorial and subarctic seas, and poses a particular issue both for conservation and fisheries management. Assoc. Professor Richardson explains, "There is also a complex mosaic of responses globally, related to local warming and cooling. For example, our analysis suggests that life in many areas in the Southern Ocean could move northward." However, as a rule, they are likely to be as great or greater in the sea than on land, as a result of its more uniform temperature distribution.

The migration is likely to be particularly pronounced among marine species living at or near the sea surface, or subsisting on marine plants and plankton that require sunlight -- and less so in the deep oceans.

"Also, as seas around the equator warm more quickly and sea life migrates away -- north or south -- in search of cooler water, it isn't clear what, if anything, will replace it," Prof Pandolfi adds. "No communities of organisms from even warmer regions currently exist to replace those moving out."

At the same time, sea life living close to the poles could find itself overwhelmed by marine migrants moving in from warmer regions, in search of cool water.

The team's future research will focus on how different ocean species respond to climate change and they are compiling a database on this for the Intergovernmental Panel on Climate Change (IPCC).

Story Source:

The above story is reprinted from materials provided by **ARC Centre of Excellence in Coral Reef Studies**.

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

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1. M. T. Burrows, D. S. Schoeman, L. B. Buckley, P. Moore, E. S. Poloczanska, K. M. Brander, C. Brown, J. F. Bruno, C. M. Duarte, B. S. Halpern, J. Holding, C. V. Kappel, W. Kiessling, M. I. O'Connor, J. M. Pandolfi, C. Parmesan, F. B. Schwing, W. J. Sydeman, A. J. Richardson. **The Pace of Shifting Climate in Marine and Terrestrial Ecosystems**. *Science*, 2011; 334 (6056): 652 DOI: [10.1126/science.1210288](https://doi.org/10.1126/science.1210288)

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Are Doctors Really to Blame for the Overdose Epidemic?

By [Maia Szalavitz](#) Wednesday, November 2, 2011 |



Forty people die each day from what Dr. Thomas Frieden, the director of the Centers for Disease Control and Prevention (CDC), calls an "epidemic" of prescription drug overdose. Frieden largely attributes the rise in overdose deaths, which have tripled since 1999, to overprescribing by doctors. But the reality is much more complicated.

At Tuesday's teleconference announcing the release of new CDC data on the problem, Frieden said, "In fact, now the burden of dangerous drugs is being created more by a few irresponsible doctors than by drug pushers on the street corners."

Such hyperbole is unlikely to lead to effective solutions for an extremely complex problem. Panics over addiction have always tended to focus relentlessly on supply, while failing to understand demand. In this case, unnecessary hysteria may also serve to reduce legitimate patients' access to needed pain treatment.

Let's start with the facts: the vast majority of people who misuse prescription painkillers — 7 out of 10, according to drug czar Gil Kerlikowske — get them from family or friends, not directly from doctors. Secondly, most people addicted to these medications have used illegal drugs previously; they do not become addicted while being treated for pain.

A 2007 [study](#) of nearly 1,400 people addicted to OxyContin, who were treated at rehabs across the country, found that 78% had never been prescribed the drug themselves; the same percentage had been in rehab for a previous drug problem. Earlier data found that 80% of those addicted to OxyContin had previously used cocaine, a rate many times that seen in the general population.



That overlap is not likely to be attributed to pain patients who suddenly decide to try cocaine. The more probable explanation is that painkiller addiction is primarily affecting people with current or previous drug problems, not innocent patients being treated by pill-happy doctors.

Indeed, it is impossible for a doctor to "make someone" into an addict. Even if the doctor tied the person down and injected him or her daily with heroin or other strong opioids, only physical dependence could be created. That means the person would suffer withdrawal symptoms when the doctor stopped, but whether such victims genuinely became addicted would be determined by their own actions after that point.

If the research data is anything to go by, most people who use illegal drugs don't subsequently go looking for dealers or rob their grandmothers to get money to buy more. Of those who try heroin, more than 80% do not become junkies. Likewise, among adults who are legitimately prescribed opioid painkillers and who do not have past histories of drug problems, more than 97% don't develop new addictions.

Normal, healthy people given these drugs tend to find them unpleasantly numbing, not overwhelmingly attractive. Even among soldiers who served in Vietnam — 45% of whom tried opium or heroin while serving — just 1% developed ongoing heroin addictions that persisted after they came home.

Addiction doesn't just "happen": it requires people to choose repeatedly to use drugs to get high or to escape. By definition, this behavior must occur *despite* ongoing negative consequences; otherwise, it is not classified as addiction.

Moreover, although people with addiction often have genetic predispositions or exposures to traumatic experience that make drugs especially attractive to them, and although continued use itself can impair decision-making, they are not automatons with no free will. Their ability to choose not to take drugs may be reduced as they get hooked, but it's not eliminated: after all, no one shoots up in front of the cops.

The fact that addiction is not just about access to drugs is why talk of drug "epidemics" rarely changes their course. Supply-side efforts have had little effect on addiction rates. The exponential growth on such spending since Ronald Reagan declared war on drugs in the 1980s has no correlation whatsoever with rates of drug problems. The recent crackdown on prescription opioids began in the mid-2000s, with intense concern over OxyContin misuse — and yet overdose deaths continue to rise.

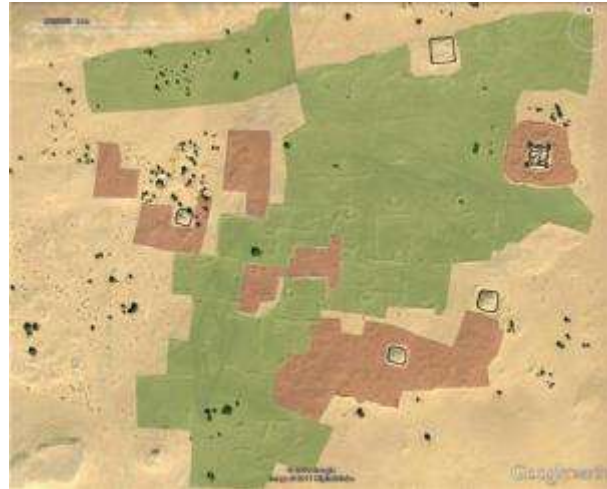
If we want to reduce opioid addiction, it might help to try to figure out why so many people feel the need to escape. And if we want to reduce opioid overdose, it might make sense to distribute the antidote, naloxone (Narcan), with prescriptions and make it available over the counter. Unlike efforts to restrict prescribing, this won't hamper appropriate pain care, and unlike rhetoric about epidemics and associated crackdowns on supply, there's actually a growing body of literature suggesting that Narcan saves lives.

Maia Szalavitz is a health writer at TIME.com. Find her on Twitter at [@maiasz](#). You can also continue the discussion on TIME Healthland's [Facebook page](#) and on Twitter at [@TIMEHealthland](#).

Read more: <http://healthland.time.com/2011/11/02/are-doctors-really-to-blame-for-the-overdose-epidemic/#ixzz1dL0V7zx0>



Castles in the Desert: Satellites Reveal Lost Cities of Libya



Satellite image of area of desert with archaeological interpretation of features: fortifications are outlined in black, areas of dwellings are in red and oasis gardens are in green. (Credit: Copyright 2011 Google, image copyright 2011 DigitalGlobe)

ScienceDaily (Nov. 7, 2011) — Satellite imagery has uncovered new evidence of a lost civilisation of the Sahara in Libya's south-western desert wastes that will help re-write the history of the country. The fall of Gaddafi has opened the way for archaeologists to explore the country's pre-Islamic heritage, so long ignored under his regime.

Using satellites and air-photographs to identify the remains in one of the most inhospitable parts of the desert, a British team has discovered more than 100 fortified farms and villages with castle-like structures and several towns, most dating between AD 1-500.

These "lost cities" were built by a little-known ancient civilisation called the Garamantes, whose lifestyle and culture was far more advanced and historically significant than the ancient sources suggested.

The team from the University of Leicester has identified the mud brick remains of the castle-like complexes, with walls still standing up to four metres high, along with traces of dwellings, cairn cemeteries, associated field systems, wells and sophisticated irrigation systems. Follow-up ground survey earlier this year confirmed the pre-Islamic date and remarkable preservation.

"It is like someone coming to England and suddenly discovering all the medieval castles. These settlements had been unremarked and unrecorded under the Gaddafi regime," says the project leader David Mattingly FBA, Professor of Roman Archaeology at the University of Leicester.

"Satellite imagery has given us the ability to cover a large region. The evidence suggests that the climate has not changed over the years and we can see that this inhospitable landscape with zero rainfall was once very densely built up and cultivated. These are quite exceptional ancient landscapes, both in terms of the range of features and the quality of preservation," says Dr Martin Sterry, also of the University of Leicester, who has been responsible for much of the image analysis and site interpretation.

The findings challenge a view dating back to Roman accounts that the Garamantes consisted of barbaric nomads and troublemakers on the edge of the Roman Empire.



"In fact, they were highly civilised, living in large-scale fortified settlements, predominantly as oasis farmers. It was an organised state with towns and villages, a written language and state of the art technologies. The Garamantes were pioneers in establishing oases and opening up Trans-Saharan trade," Professor Mattingly said.

The professor and his team were forced to evacuate Libya in February when the anti-Gaddafi revolt started, but hope to be able to return to the field as soon as security is fully restored. The Libyan antiquities department, badly under-resourced under Gaddafi, is closely involved in the project. Funding for the research has come from the European Research Council who awarded Professor Mattingly an ERC Advanced Grant of nearly 2.5m euros, the Leverhulme Trust, the Society for Libyan Studies and the GeoEye Foundation.

"It is a new start for Libya's antiquities service and a chance for the Libyan people to engage with their own long-suppressed history," says Professor Mattingly.

"These represent the first towns in Libya that weren't the colonial imposition of Mediterranean people such as the Greeks and Romans. The Garamantes should be central to what Libyan school children learn about their history and heritage."

Story Source:

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

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<http://www.sciencedaily.com/releases/2011/11/111107121448.htm>



From Dream Into Nightmare

by Alan Sked — 02.11.2011

European politicians are willing to engage in evermore absurd policies to keep the EU intact. But what if it has served its purpose? What if the European Union is a product of postwar reconciliation that has now outlived its usefulness?



Last month I argued that Europe required a democratic revolution if ordinary voters were expected to back the structural reforms needed to save the euro. However, perhaps predictably, the remedies being discussed by the elite are all designed to bypass the democratic process. The richer states still want the poorer ones to bear the brunt of the economic crisis while the longer-term plan seems to be to create a proto-fiscal union by stealth: national governments will ask their parliaments to enact measures to establish a common financial regulatory system which will be enforced by a single watchdog.

This will not work: until a system is in place that allows payment transfers from Germany and other countries to Greece, Italy and Spain through a genuine fiscal union, the sovereign debts of the PIGS will remain.

However, only democratic votes in all EU member states can legitimize such an advance in federalist government.

So the European Ideal is now faced with a reality check. Do Europeans actually think of themselves as citizens of one country? Do they actually believe they have common ethical, social and political standards? Do they want to share their savings and their salaries with one another? Do they actually trust one another to

follow the rules and not to cheat? Would a fiscal union be a solution to Europe's problems or an economic suicide pact?

Some of us see Europe as a state system rather than a single state. We believe in common values as aspirations but recognize that Europe is a diverse community of historical actors with different political and social cultures and that this diversity should be tolerated and respected. We see the attempt by bureaucrats in Brussels to create plastic, assembly-line citizens for a plastic Union as un-European and unrealistic.

We liked EFTA which allowed Europe's natural units—nation states—to trade freely without a suffocating blanket of central regulation.

We still believe that Europeans can coexist peacefully and in prosperity outside a straightjacket of federal law. National federal states may work but international ones do not. Just look at the resentments created in Canada by one French-speaking state, Quebec. Or even at the tensions created in the UK by the Scottish National Party. Think what would happen in the USA if Texas or California adopted Spanish as its official language. It may not therefore be a very good idea in Europe to start creating a new sort of Habsburg Monarchy.

Maybe the EU has served its purpose. Maybe its task of reconciling states after the destruction of the Third Reich, the USSR and Yugoslavia has been fulfilled. Maybe we don't actually need an EU any more. Certainly the price now being asked seems extraordinarily high.

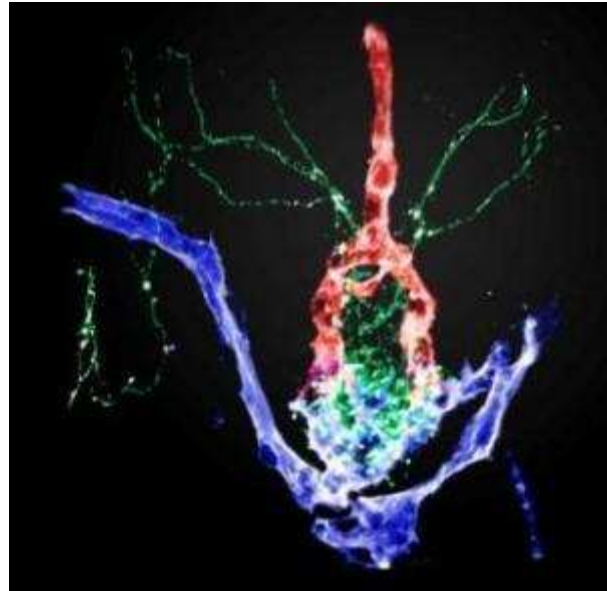
About the Author



Alan Sked is Professor of International History at the London School of Economics, where he has spent all his professional life after receiving his doctorate at Oxford. He studies modern and contemporary European, American and British history. Sked also works as an author and consultant at the BBC. He is the founder of the UK Independence Party which he led from 1993-1997 but left when he feared it was becoming too right-wing. He was born in Scotland but lives in London.

<http://www.theeuropean-magazine.com//304-sked-alan/406-europes-common-future#406>

New Role for 'Hormone of Love' Oxytocin in Brain: Helps Direct Development of Brain-Body Interface



Three-dimensional structure of the neurohypophysis in a zebrafish embryo (the nerve fibers and blood vessels are genetically tagged with fluorescent proteins). This brain area provides an interface between nerve cells (green), arteries (purple) and veins (red). (Credit: Image courtesy of Weizmann Institute of Science)

ScienceDaily (Nov. 2, 2011) — Much of the body's chemistry is controlled by the brain -- from blood pressure to appetite to food metabolism. In a study published recently in *Developmental Cell*, a team of scientists led by Dr. Gil Levkowitz of the Weizmann Institute has revealed the exact structure of one crucial brain area in which biochemical commands are passed from the brain cells to the bloodstream and from there to the body. In the process, they discovered a surprising new role for the "hormone of love," showing that it helps to direct the development of this brain structure.

The area in question, the neurohypophysis, is an interface between nerve fibers and blood vessels located at the base of the brain. Here, some of the major brain-body interactions take place: Hormones released from nerves into the blood vessels regulate a series of vital body processes, including the balance of fluids and uterine contractions in childbirth.

Although the neurohypophysis has been studied for more than a century, the scientists in the Weizmann Institute-led study developed new genetic tools that enabled them to examine the exact three-dimensional arrangement of this brain structure and clarify the cellular and molecular processes leading to its formation. Since the human neurohypophysis is exceedingly complex, the scientists performed the research on live embryos of zebrafish. These fully transparent embryos offer a unique model for studying the vertebrate brain, lending themselves to genetic manipulation with relative ease and enabling researchers to observe the actual formation of a neurohypophysis under a microscope.

The study revealed a surprising new function for the hormonal messenger oxytocin, dubbed the "hormone of love" because, in addition to controlling appetite and such female reproductive behaviors as breastfeeding, it is also involved in mother-child and mate bonding. The scientists showed that oxytocin, one of the two major hormones secreted in the adult neurohypophysis, is involved in the development of this brain area already in the embryo. At this stage, the oxytocin governs the formation of new blood vessels. "The messenger helps to build the road for transmitting its own future messages," says Levkowitz. *Developmental Cell* highlighted the study's findings in a preview headlined, "The Hormone of Love Attracts a Partner for Life."



These findings provide an important advance in basic research because they shed light on fundamental brain processes, but in the future they might also be relevant to the treatment of disease. Since the neurohypophysis is one of only a few portions of the brain able to regenerate after injury, an understanding of how it is formed may one day help achieve such regeneration in other parts of the central nervous system.

The research was conducted in Levkowitz's lab in the Molecular Cell Biology Department by Ph.D. student Amos Gutnick together with Dr. Janna Blechman. The Weizmann scientists worked in collaboration with Dr. Jan Kaslin of Monash University, Australia; Drs. Lukas Herwig, Heinz-Georg Belting and Markus Affolter of the University of Basel, Switzerland; and Dr. Joshua L. Bonkowsky of the University of Utah, United States.

Story Source:

The above story is reprinted from materials provided by **Weizmann Institute of Science**.

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/2011/11/111102093035.htm>



Debunking the Myth of the 'Freshman 15'

By [Tara Thean](#) Wednesday, November 2, 2011 |



Getty Images

Contrary to college folklore, the dreaded "freshman 15" — the notion that students gain 15 lbs. during their first year at school — is a myth, according to a study from Ohio State University.

"Our results indicate that the 'freshman 15' is a media myth," write the authors of the study, slated to appear in the December issue of the journal *Social Science Quarterly*, noting that the first mention of the phenomenon in the popular press appeared in 1989 in an article in *Seventeen Magazine*.

Intuitively, it might make sense that certain aspects of the college lifestyle — late-night pizza runs, unlimited dining hall food, excessive drinking and long hours spent sedentary in the library — would encourage weight gain. And the study did find that students put on a few pounds freshman year, but nowhere close to 15 lbs.

During their first year at school, students gained about two-and-a-half to three-and-a-half pounds: median weight gain in freshman women was 2.4 lbs.; in men, it was 3.4 lbs. Even over their entire college careers, students didn't gain 15 lbs. In four years, women gained a median 6.5 lbs. and men gained 12.1 lbs, the study found.

"The typical student is not going to get fat," says Jay Zagorsky, study co-author and research scientist at Ohio State University's Center for Human Resource Research. "When I walk in and start teaching freshmen in September, I don't see them gain weight before my eyes. They don't walk in slim and walk out fat."

Zagorsky and his co-author, Patricia Smith of the University of Michigan–Dearborn, used data from the 1997 National Longitudinal Survey of Youth, which included interviews with nearly 9,000 youths aged 13 to 17 in 1997 and has tracked them each year since then. For the survey, respondents, who come from all over the U.S., answer various questions annually, including about their weight and college status.



Based on the data, the authors found, 25% of students reported actually *losing* weight during their freshman year, and fewer than 10% of freshmen gained 15 lbs. or more. Researchers looked at several factors that could contribute to weight gain, such as living in a dorm, going to school full- or part-time or attending a private school versus a public school. None made a difference.

The only factor that was significantly associated with weight gain was heavy drinking (consuming six or more alcoholic drinks on at least four days per month). But even heavy drinkers gained less than a pound more than those who drank less. Aside from freshman weight gain, says Zagorsky, "There are many reasons for not being a heavy drinker."

The data suggest that students gain weight not because they're students, but because they're aging. The typical freshman gained less than a pound more than non-college students of the same age. Zagorsky noted also that people continue to gain weight "every single year" after they receive their diploma: in the first four years post-college, survey respondents gained an average of 1.5 lbs. per year — a worrying statistic for the country's obesity problem.

"It doesn't matter where you start from — even if you're starting out extremely thin — if you're gaining 1.5 pounds every year then you're going to get fat," Zagorsky says. "Slow and steady is good when you're trying to save money, but is not good for weight gain."

The income hike that comes after graduation probably doesn't help when it comes to weight, Zagorsky suggests, given that young college grads tend to spend their disposable income on eating and drinking. "Food and drink tend to be relatively high on people's consumption," he says. "But that's all speculation."

MORE: [Why Lovin' the McRib Isn't Heart Smart](#)

The study authors urge the media and universities to stop using the term "freshman 15," since it's not only misleading, but may also add to problem of distorted body image among college students, particularly young women. They recommend that the message be reframed to reflect reality: that weight gain isn't inevitable, and that healthy living should take precedence over an unfounded fear of getting fat.

"When someone says a phrase like 'freshman 15' over and over again — whether the phrase is true or not — you tend to believe something that's repeated many, many times," Zagorsky says. College students have enough worries as it is, and for the average student, it looks like weight gain shouldn't be among them.

Tara Thean is a TIME contributor. Find her on Twitter at [@TaraThean](#). You can also continue the discussion on TIME's [Facebook page](#) and on Twitter at [@TIME](#).

Read more: <http://healthland.time.com/2011/11/02/debunking-the-myth-of-the-freshman-15/#ixzz1dL0FjAEJ>



Easily 'Re-Programmable Cells' Could Be Key in Creation of New Life Forms

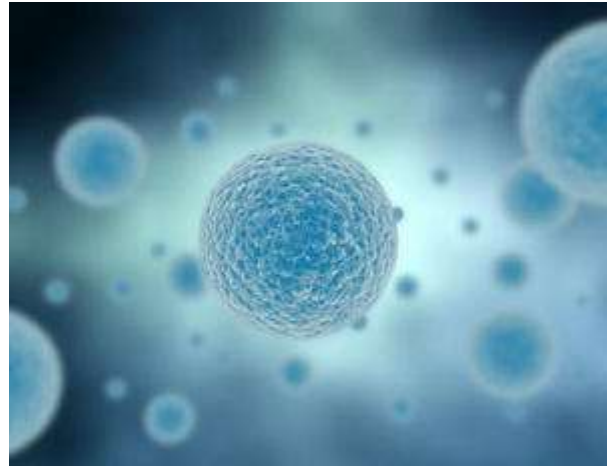


Illustration of cells. (Credit: © Jezper / Fotolia)

ScienceDaily (Nov. 7, 2011) — Scientists at The University of Nottingham are leading an ambitious research project to develop an *in vivo* biological cell-equivalent of a computer operating system.

The success of the project to create a 're-programmable cell' could revolutionise synthetic biology and would pave the way for scientists to create completely new and useful forms of life using a relatively hassle-free approach.

Professor Natalio Krasnogor of the University's School of Computer Science, who leads the Interdisciplinary Computing and Complex Systems Research Group, said: "We are looking at creating a cell's equivalent to a computer operating system in such a way that a given group of cells could be seamlessly re-programmed to perform any function without needing to modifying its hardware."

"We are talking about a highly ambitious goal leading to a fundamental breakthrough that will, -- ultimately, allow us to rapidly prototype, implement and deploy living entities that are completely new and do not appear in nature, adapting them so they perform new useful functions."

The game-changing technology could substantially accelerate Synthetic Biology research and development, which has been linked to myriad applications -- from the creation of new sources of food and environmental solutions to a host of new medical breakthroughs such as drugs tailored to individual patients and the growth of new organs for transplant patients.

The multi-disciplinary project, funded with a leadership fellowship for Professor Krasnogor worth more than £1 million from the Engineering and Physical Sciences Research Council (EPSRC), involves computer scientists, biologists and chemists from Nottingham as well as academic colleagues at other universities in Scotland, the US, Spain and Israel.

The project -- *Towards a Biological Cell Operating System (AUdACiOuS)* -- is attempting to go beyond systems biology -- the science behind understanding how living organisms work -- to give scientists the power to create biological systems. The scientists will start the work by attempting to make *e.coli* bacteria much more easy to program.



Professor Krasnogor added: "This EPSRC Leadership Fellowship will allow me to transfer my expertise in Computer Science and informatics into the wet lab.

"Currently, each time we need a cell that will perform a certain new function we have to recreate it from scratch which is a long and laborious process. Most people think all we have to do to modify behaviour is to modify a cell's DNA but it's not as simple as that -- we usually find we get the wrong behaviour and then we are back to square one. If we succeed with this AUdACiOuS project, in five years time, we will be programming bacterial cells in the computer and compiling and storing its program into these new cells so they can readily execute them.

"Like for a computer, we are trying to create a basic operating system for a biological cell."

Among the most fundamental challenges facing the scientists will be developing new computer models that more accurately predict the behaviour of cells in the laboratory.

Scientists can already programme individual cells to complete certain tasks but scaling up to create a larger organism is trickier.

The creation of more sophisticated computer modelling programmes and a cell that could be re-programmed to fulfil any function without having to go back to the drawing board each time could largely remove the trial and error approach currently taken and allow synthetic biology research to take a significant leap forward.

The technology could be used in a whole range of applications where being able to modify the behaviour of organisms could be advantageous. In the long run, this includes the creation of new microorganisms that could help to clean the environment for example by capturing carbon from the burning of fossil fuel or removing contaminants, e.g. arsenic from water sources. Alternatively, the efficacy of medicine could be improved by tailoring it to specific patients to maximise the effect of the drugs and to reduce any harmful side effects.

The partners in the project are The University of Nottingham and The University of Edinburgh in the UK; Arizona State University, Massachusetts Institute of Technology, Michigan State University, New York University, University of California Santa Barbara, University of California, San Francisco in the US; Centro Nacional de Biotecnología in Spain; and the Weizmann Institute of Science in Israel.

Story Source:

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<http://www.sciencedaily.com/releases/2011/11/111107162223.htm>





What's More Expensive, Prison Or Princeton?

You probably don't even want to know.

We're all moderately aware that the prison system costs taxpayers a lot of money. But how expensive is it really?

More expensive than going to an Ivy League school.

This provocative [infographic](#) from [PublicAdministration.net](#), an online resource for students and professionals in public administration, shows that it costs the state of New Jersey more to lock away a prisoner in Trenton (\$44,000) than it does to send someone to Princeton for a year (\$37,000).

But that's not even the worst of it. The chart goes on to compare the anatomy of the corrections system to that of higher education in the United States, with some disturbing results: Spending soared 127% in prisons between 1987 and 2007; in higher education, it increased just 21%. State like New Hampshire, Vermont, and New Jersey blow nearly twice as much on incarceration as they do on secondary education. In California alone, spending averages \$48,214 per inmate and only \$7,463 per student.

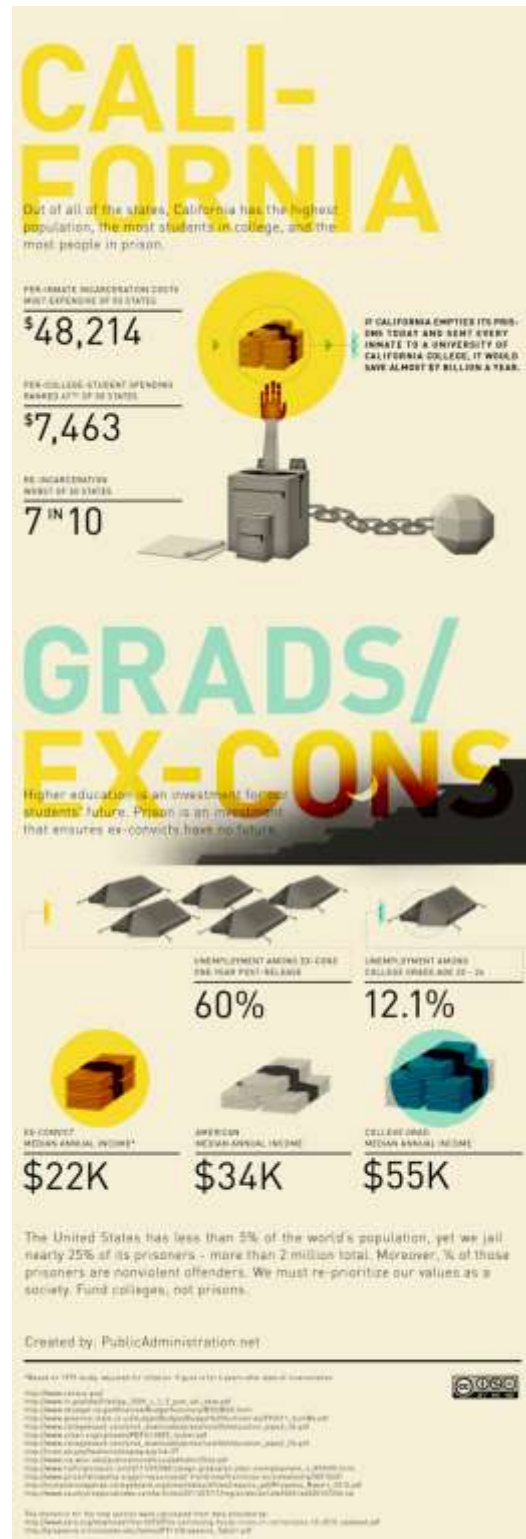
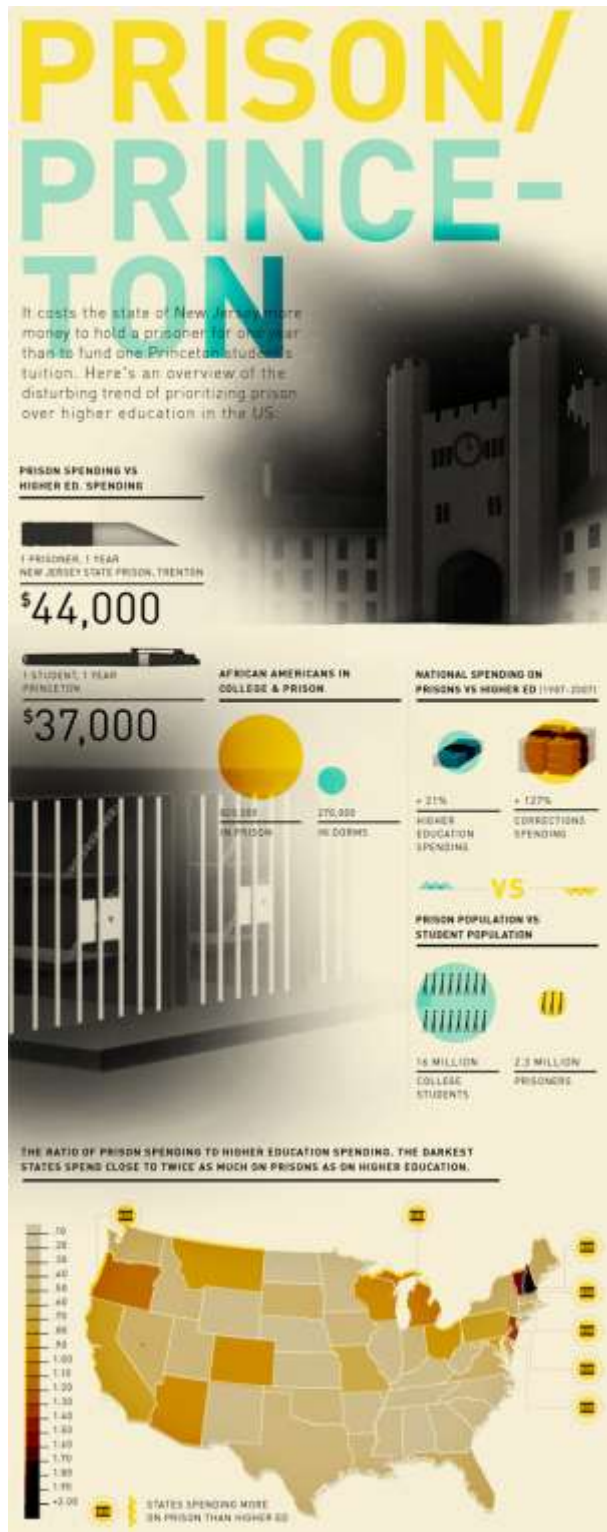
All of which disproportionately affects black America. The number of African Americans in dorm rooms: 270,000. In prison? 820,000.

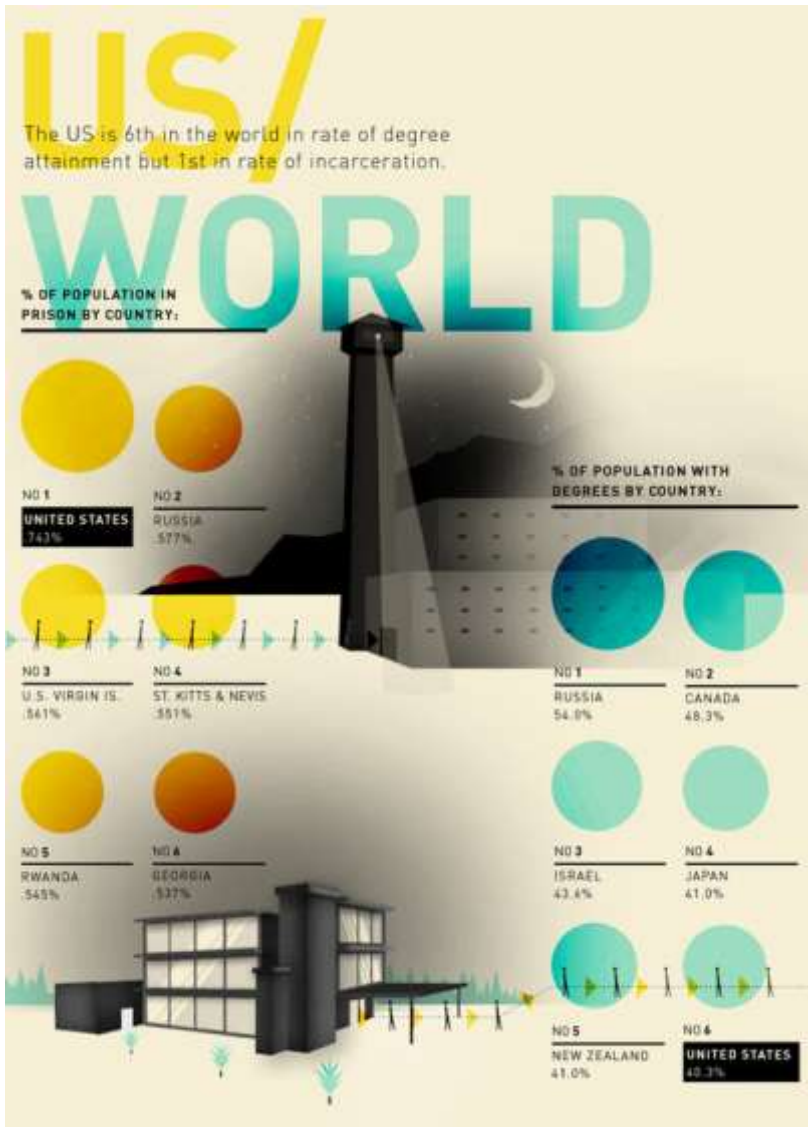
And it's not like this a global phenomenon. The United States has 5% of the world population and 25% of the world's incarcerated population. To put that in the context of higher education: The incarceration rate is higher here than in any other country, while our college graduation rate is sixth in the world.

To be sure, the chart elides certain details, like the socio-economic roots of incarceration. But as a basic portrait of American priorities, it's pretty telling: We care more about sending people to prison than we do about helping them get an education. And we're dumber and poorer for it.

[Hat tip to [Andrew Sullivan](#); Top image by [CJ Schmit](#)]

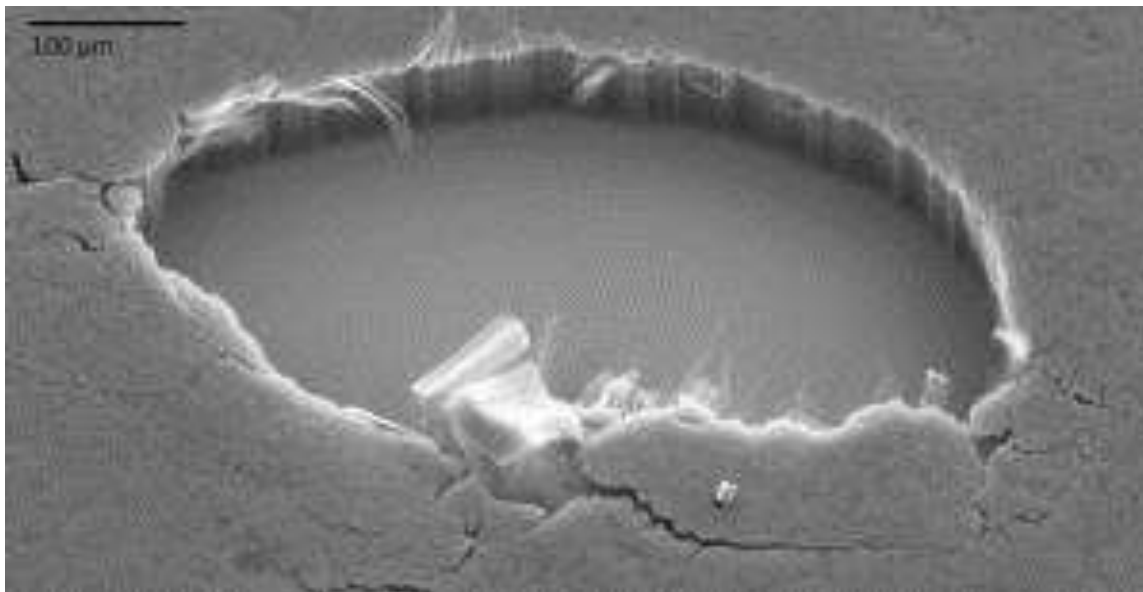






<http://www.fastcodesign.com/1665387/infographic-of-the-day-what-s-more-expensive-prison-or-princeton>

NASA Develops Super-Black Material That Absorbs Light Across Multiple Wavelength Bands



This close-up view (only about 0.03 inches wide) shows the internal structure of a carbon-nanotube coating that absorbs about 99 percent of the ultraviolet, visible, infrared, and far-infrared light that strikes it. A section of the coating, which was grown on smooth silicon, was purposely removed to show the tubes' vertical alignment. (Credit: Stephanie Getty, NASA Goddard)

ScienceDaily (Nov. 8, 2011) — NASA engineers have produced a material that absorbs on average more than 99 percent of the ultraviolet, visible, infrared, and far-infrared light that hits it -- a development that promises to open new frontiers in space technology.

The team of engineers at NASA's Goddard Space Flight Center in Greenbelt, Md., reported their findings recently at the SPIE Optics and Photonics conference, the largest interdisciplinary technical meeting in this discipline. The team has since reconfirmed the material's absorption capabilities in additional testing, said John Hagopian, who is leading the effort involving 10 Goddard technologists.

"The reflectance tests showed that our team had extended by 50 times the range of the material's absorption capabilities. Though other researchers are reporting near-perfect absorption levels mainly in the ultraviolet and visible, our material is darn near perfect across multiple wavelength bands, from the ultraviolet to the far infrared," Hagopian said. "No one else has achieved this milestone yet."

The nanotech-based coating is a thin layer of multi-walled carbon nanotubes, tiny hollow tubes made of pure carbon about 10,000 times thinner than a strand of human hair. They are positioned vertically on various substrate materials much like a shag rug. The team has grown the nanotubes on silicon, silicon nitride, titanium, and stainless steel, materials commonly used in space-based scientific instruments. (To grow carbon nanotubes, Goddard technologist Stephanie Getty applies a catalyst layer of iron to an underlayer on silicon, titanium, and other materials. She then heats the material in an oven to about 1,382 degrees Fahrenheit. While heating, the material is bathed in carbon-containing feedstock gas.)

The tests indicate that the nanotube material is especially useful for a variety of spaceflight applications where observing in multiple wavelength bands is important to scientific discovery. One such application is stray-light suppression. The tiny gaps between the tubes collect and trap background light to prevent it from



reflecting off surfaces and interfering with the light that scientists actually want to measure. Because only a small fraction of light reflects off the coating, the human eye and sensitive detectors see the material as black.

In particular, the team found that the material absorbs 99.5 percent of the light in the ultraviolet and visible, dipping to 98 percent in the longer or far-infrared bands. "The advantage over other materials is that our material is from 10 to 100 times more absorbent, depending on the specific wavelength band," Hagopian said.

"We were a little surprised by the results," said Goddard engineer Manuel Quijada, who co-authored the SPIE paper and carried out the reflectance tests. "We knew it was absorbent. We just didn't think it would be this absorbent from the ultraviolet to the far infrared."

If used in detectors and other instrument components, the technology would allow scientists to gather hard-to-obtain measurements of objects so distant in the universe that astronomers no longer can see them in visible light or those in high-contrast areas, including planets in orbit around other stars, Hagopian said. Earth scientists studying the oceans and atmosphere also would benefit. More than 90 percent of the light Earth-monitoring instruments gather comes from the atmosphere, overwhelming the faint signal they are trying to retrieve.

Currently, instrument developers apply black paint to baffles and other components to help prevent stray light from ricocheting off surfaces. However, black paints absorb only 90 percent of the light that strikes it. The effect of multiple bounces makes the coating's overall advantage even larger, potentially resulting in hundreds of times less stray light.

In addition, black paints do not remain black when exposed to cryogenic temperatures. They take on a shiny, slightly silver quality, said Goddard scientist Ed Wollack, who is evaluating the carbon-nanotube material for use as a calibrator on far-infrared-sensing instruments that must operate in super-cold conditions to gather faint far-infrared signals emanating from objects in the very distant universe. If these instruments are not cold, thermal heat generated by the instrument and observatory, will swamp the faint infrared they are designed to collect.

Black materials also serve another important function on spacecraft instruments, particularly infrared-sensing instruments, added Goddard engineer Jim Tuttle. The blacker the material, the more heat it radiates away. In other words, super-black materials, like the carbon nanotube coating, can be used on devices that remove heat from instruments and radiate it away to deep space. This cools the instruments to lower temperatures, where they are more sensitive to faint signals.

To prevent the black paints from losing their absorption and radiative properties at long wavelengths, instrument developers currently use epoxies loaded with conductive metals to create a black coating. However, the mixture adds weight, always a concern for instrument developers. With the carbon-nanotube coating, however, the material is less dense and remains black without additives, and therefore is effective at absorbing light and removing heat. "This is a very promising material," Wollack said. "It's robust, lightweight, and extremely black. It is better than black paint by a long shot."

Story Source:

The above story is reprinted from materials provided by NASA.

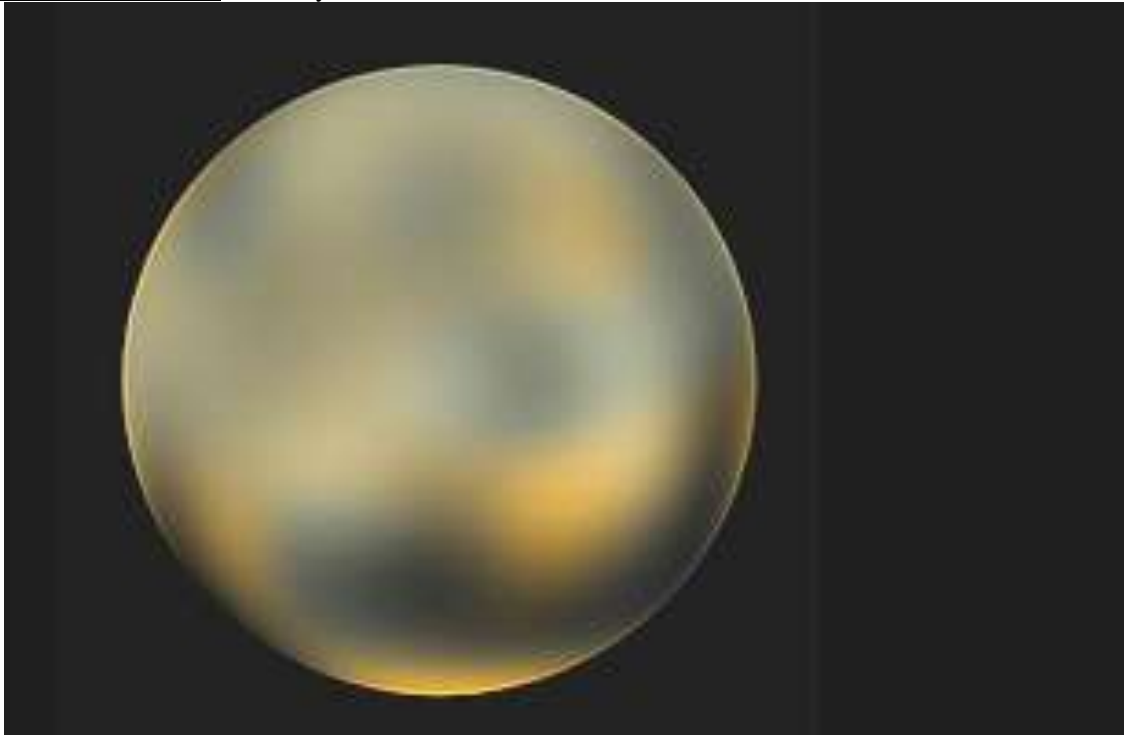
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<http://www.sciencedaily.com/releases/2011/11/111108213055.htm>



Is There a City on Pluto? Before You Answer, Consider: We've Never Looked. Two Scientists Want to Change That

By Michael D. Lemonick Thursday, Nov. 10, 2011



A Hubble Space Telescope photo of Pluto Reuters / Corbis

Before Ed Turner and Avi Loeb tell you about their research, they want to make one thing perfectly clear: they do not claim that there's a city on Pluto. But if there were one, they say, we could see it. And as they suggest in a paper they've submitted to the journal *Astrobiology*, it's worth taking a look, just in case.

The whole thing began a couple of years ago, when Loeb and Turner, astrophysicists at Harvard and Princeton, respectively, were at a conference in Abu Dhabi. The organizers sent them on a tour of nearby Dubai, where the guide bragged that his gleaming, ultramodern city was so brightly lit at night that from space it would outshine London, Paris or New York City. ([See pictures of deep space from the Hubble telescope.](#))

That got the pair thinking: how far away could you see a major city on another world using existing telescopes? The question percolated for a while, until Loeb mentioned it to Freeman Dyson, the Institute for Advanced Study physicist famous for spending more time thinking outside the box than in it. (In the early 1960s, Dyson worked on the idea of a rocket propelled by atom bombs, and has suggested that astronomers look for aliens who might have enclosed their stars to trap solar energy.) Dyson was, predictably, intrigued by the question of extraterrestrial cities. "He encouraged us to write it up," says Loeb.

The city the researchers picked as a reference wasn't Dubai; it was Tokyo. "I love Tokyo," Turner admits, but that wasn't the reason for the choice. Instead, it is because the loss of the Fukushima nuclear plants in last spring's earthquake and tsunami forced major power cutbacks in Japan. As a result, there was a lot of information publicly available about how much electricity Tokyo uses for what purposes, which made its light output easy to calculate.



Unsurprisingly, there's no way you could see city lights on a planet orbiting another star. Even if aliens used a whole lot more light than we do, says Turner, the ability to detect it at such vast distances is "two or three generations of telescope away." But closer to home, you might see a glimmer. Tokyo, Turner and Loeb calculated, would be visible at the very edge of our solar system, 30 times farther out than Pluto — though it would take a long exposure on a telescope like the Hubble to see it. ([See slightly altered pictures of the solar system.](#))

Even if you spotted something suggesting a city in space, you'd still have to figure out whether the light was artificial — alien-made, in other words — or simply reflected back from the sun. One way to do that is with a spectrograph, which breaks light into a rainbow of colors; artificial light makes for a different sort of rainbow from the one sunlight produces. Again, though, that takes a powerful telescope.

But Loeb and Turner realized there was a much simpler way to do things. As Isaac Newton showed, the intensity of light drops off with the inverse of the square of distance. In plain English, this means that if you move a light source twice as far away, it becomes a fourth as bright. Move it three times as far and it becomes a ninth as bright. Many objects in the Kuiper Belt — the ring of comets and other bodies that surround the solar system — are in highly elliptical orbits, meaning they get closer and farther away as they orbit the sun. A Kuiper Belt Tokyo would get brighter and dimmer with that motion, and it would do so according to Newton's inverse-square law.

The nifty thing is, the law applies only if you're seeing light produced by the orbiting object itself. If all you're seeing is reflected sunlight, it would be much dimmer, since the light has to travel from the sun, bounce off the object, then bounce again to Earth, which doubles the Newtonian effect. If the object were to move twice as far from Earth, its light would be not four times dimmer but 16.

So all you need to do is watch Pluto and its kin for a while and see which rule their light follows. And while keeping a constant eye on them would ordinarily be a time-consuming chore, a new instrument called the Large Synoptic Survey Telescope will be coming on line by the end of the decade. Its only job will be to survey the sky every few nights with the world's most powerful light detectors. Among other things, it will note anything that changes, including stars that pulsate, stars that explode, potentially dangerous near-Earth asteroids — and Kuiper Belt objects that move and, maybe, brighten or dim in unexpected ways. ([See pictures of outer space.](#))

One obvious question Loeb and Turner's idea raises is, Why would aliens have lights on, if we always see the sun-facing, daylight side of Kuiper Belt objects? The answer: the sun is so faint at the edges of the solar system that any beings that evolved closer in would feel the need to supplement natural light by a lot, even at high noon. And the aliens would have to have evolved closer in because the emergence of life, as far as we know, requires liquid water. Once they had emerged and evolved, a gravitational encounter with a larger planet would have shotgunned them out to the fringes.

O.K., the fact is, it's vanishingly unlikely that there's some thriving Manhattan or Minneapolis stuck on an ice ball in the depths of the Kuiper Belt. But the same principles of reflected light that would reveal the existence of such a city can also help scientists study the size, rotation and reflectivity of other worlds. And of course, the zillion to 1 improbability of a Kuiper metropolis is not the same as absolutely ruling it out. "It's unlikely that there are cities in the Kuiper Belt, but we should not pretend we know this for sure," Turner says. "If it involves no additional resources, we should definitely [look for it]." In that, Turner echoes the words of Philip Morrison and Giuseppe Cocconi, whose forward-looking 1960 paper in the journal *Nature* laid the intellectual foundation for SETI, the search for extraterrestrial intelligence. "The probability of success is difficult to estimate," they wrote. "But if we never search, the chance of success is zero."

Read more: <http://www.time.com/time/health/article/0,8599,2098834,00.html#ixzz1dKzaWK8i>



Half-Billion-Year-Old Predator Tracked: Multi-Legged Creature Ruled the Seas



Tegopelte gigas from the Walcott Quarry Shale Member at the Walcott Quarry. (a) Holotype (USNM 189201) showing the hypostome, H, left antennae, La, right antennae, Ra, notches, n, at the anterior and posterior end, and the alimentary canal, al. Scale bar, 30 mm (b) Counterpart of the holotype showing the gut diverticulae, gd. Scale bar, 30 mm (c) Details of gut diverticulae. Scale bar, 10 mm (d) Paratype (USNM 189200) showing the additional presence of a left eye, Le and right eye, Re. Eyes are tear-shaped and likely ventral in position. Scale bar, 30 mm. (Credit: Images courtesy Smithsonian Institution – National Museum of Natural History / Photos: Jean-Bernard Caron)

ScienceDaily (Nov. 8, 2011) — Researchers from the University of Saskatchewan and Royal Ontario Museum (ROM) have followed fossilized footprints to a multi-legged predator that ruled the seas of the Cambrian period about half a billion years ago.

"Short of finding an animal at the end of its trackway, it's really very rare to be able to identify the producer so confidently," said Nicholas Minter, lead author of the article on the study, which appears in the latest issue of the *Proceedings of the Royal Society B*. Minter is a postdoctoral research fellow in the U of S department of geological sciences.

The research team worked with samples gathered from the Burgess Shale, famed for its exquisitely detailed fossils from the Cambrian Explosion, a time when life underwent a dramatic change with the appearance of all the modern groups of organisms and some bizarre creatures. Located near the village of Field in Canada's Yoho National Park in British Columbia, the Burgess Shale is an international treasure, providing an unparalleled window into the distant past.

Fossils from the Burgess Shale record not only the animals themselves -- exceedingly rare because most of them had soft bodies -- but also the trackways they left behind while hunting on the sea floor.

"Most researchers have focused on the body fossils of the Burgess Shale," said study co-author Gabriela Mángano, who co-leads the ichnology research group in the U of S geological sciences department with colleague Luis Buatois. "By studying its trackways, trails and burrows, we may dramatically impact our understanding of these ancient ecosystems."

Key to the research were trackways collected during a field expedition in 2008 led by ROM curator Jean-Bernard Caron.

"I spotted a portion of the largest trackway, which is over three metres in length, in 2000," he said. "At that time we left most of it behind us. We could not carry the pieces safely down slope from this remote site without helicopter support."



The 2008 expedition included this support, so fragments of the trackway were collected by carefully separating them from the associated rock layers. These delicate pieces were then packed, air lifted from the mountain, and shipped to the ROM.

Fossil trackways and other fossilized evidence of animal activities such as burrows, bite marks and feces are known as trace fossils. These provide evidence of where animals were living and what they were doing, but the full identity of the producers is rarely known.

In this case, size of the tracks and the number of legs needed to make them left only one suspect: *Tegopelte gigas*. This caterpillar-like animal sported a smooth, soft shell on its back and 33 pairs of legs beneath. One of the largest arthropods of its time, it could reach up to 30 cm in length.

By analyzing both the fossilized remains of *Tegopelte* and the trackways, the researchers were able to reconstruct how this animal would have moved. The creature was capable of skimming rapidly across the seafloor, with legs touching the sediment only briefly, supporting the view that *Tegopelte* was a large and active top carnivore. Such lifestyles would have been important in shaping early marine communities and evolution during the Cambrian explosion.

The trackways were collected under Parks Canada Research and Collecting permits and are now located at the ROM. Managed by Parks Canada, the Burgess Shale was recognized in 1981 as one of Canada's first UNESCO World Heritage Sites. Now protected under the larger Rocky Mountain Parks UNESCO World Heritage Site, the Burgess Shale attracts visitors to Yoho each year for guided hikes to the restricted fossil beds from July to September.

The full article, "Skimming the surface with Burgess Shale arthropod locomotion," is published in the *Proceedings of the Royal Society B*. Photos and illustrations related to the article are available from the authors. Funding for this research was provided through grants from the Natural Sciences and Engineering Research Council, the Canadian Commonwealth Scholarship Program, the U of S and ROM.

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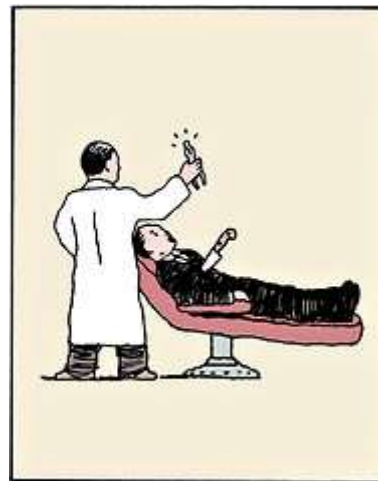
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Wanted: Worldly Philosophers

By **ROGER E. BACKHOUSE** and **BRADLEY W. BATEMAN**



IT'S become commonplace to criticize the "Occupy" movement for failing to offer an alternative vision. But the thousands of activists in the streets of New York and London aren't the only ones lacking perspective: economists, to whom we might expect to turn for such vision, have long since given up thinking in terms of economic systems — and we are all the worse for it.

This wasn't always the case. Course lists from economics departments used to be filled with offerings in "comparative economic systems," contrasting capitalism and socialism or comparing the French, Scandinavian and Anglo-Saxon models of capitalism.

Such courses arose in the context of the cold war, when the battle with the Soviet Union was about showing that our system was better than theirs. But with the demise of the Soviet Union, that motivation disappeared. Globalization, so it is claimed, has created a single system of capitalism driven by international competition (ignoring the very real differences between, say, China and the United States). We now have an economics profession that hardly ever discusses its fundamental subject, "capitalism."

Many economists say that what matters are questions like whether markets are competitive or monopolistic, or how monetary policy works. Using broad, ill-defined notions like capitalism invites ideological grandstanding and distracts from the hard technical problems.

There is a lot in that argument. Economists do much better when they tackle small, well-defined problems. As John Maynard Keynes put it, economists should become more like dentists: modest people who look at a small part of the body but remove a lot of pain.

However, there are also downsides to approaching economics as a dentist would: above all, the loss of any vision about what the economic system should look like. Even Keynes himself was driven by a powerful vision of capitalism. He believed it was the only system that could create prosperity, but it was also inherently unstable and so in need of constant reform. This vision caught the imagination of a generation that had experienced the Great Depression and World War II and helped drive policy for nearly half a century. He was, as the economist Robert Heilbroner claimed, a "worldly philosopher," alongside such economic visionaries as Adam Smith, John Stuart Mill and Karl Marx.



In the 20th century, the main challenge to Keynes's vision came from economists like Friedrich Hayek and Milton Friedman, who envisioned an ideal economy involving isolated individuals bargaining with one another in free markets. Government, they contended, usually messes things up. Overtaking a Keynesianism that many found inadequate to the task of tackling the stagflation of the 1970s, this vision fueled neoliberal and free-market conservative agendas of governments around the world.

THAT vision has in turn been undermined by the current crisis. It took extensive government action to prevent another Great Depression, while the enormous rewards received by bankers at the heart of the meltdown have led many to ask whether unfettered capitalism produced an equitable distribution of wealth. We clearly need a new, alternative vision of capitalism. But thanks to decades of academic training in the "dentistry" approach to economics, today's Keynes or Friedman is nowhere to be found.

Another downside to the "dentistry" approach to economics is that important pieces of human experience can easily fall from sight. The government does not cut an abstract entity called "government spending" but numerous spending programs, from veterans' benefits and homeland security to Medicare and Medicaid. To refuse to discuss ideas such as types of capitalism deprives us of language with which to think about these problems. It makes it easier to stop thinking about what the economic system is for and in whose interests it is working.

Perhaps the protesters occupying Wall Street are not so misguided after all. The questions they raise — how do we deal with the local costs of global downturns? Is it fair that those who suffer the most from such downturns have their safety net cut, while those who generate the volatility are bailed out by the government? — are the same ones that a big-picture economic vision should address. If economists want to help create a better world, they first have to ask, and try to answer, the hard questions that can shape a new vision of capitalism's potential.

Roger E. Backhouse, a professor of economic history at the University of Birmingham, and Bradley W. Bateman, a professor of economics at Denison University, are the authors of "Capitalist Revolutionary: John Maynard Keynes."

http://www.nytimes.com/2011/11/06/opinion/sunday/worldly-philosophers-wanted.html?_r=1



Ancient Lunar Dynamo May Explain Magnetized Moon Rocks



The moon may have had a magnetic field early in its history. (Credit: © Zhanna Ocheret / Fotolia)

ScienceDaily (Nov. 9, 2011) — The presence of magnetized rocks on the surface of the moon, which has no global magnetic field, has been a mystery since the days of the Apollo program. Now a team of scientists has proposed a novel mechanism that could have generated a magnetic field on the moon early in its history.

The "geodynamo" that generates Earth's magnetic field is powered by heat from the inner core, which drives complex fluid motions in the molten iron of the outer core. But the moon is too small to support that type of dynamo, according to Christina Dwyer, a graduate student in Earth and planetary sciences at the University of California, Santa Cruz. In the Nov. 10 issue of *Nature*, Dwyer and her coauthors--planetary scientists Francis Nimmo at UC Santa Cruz and David Stevenson at the California Institute of Technology--describe how an ancient lunar dynamo could have arisen from stirring of the moon's liquid core driven by the motion of the solid mantle above it.

"This is a very different way of powering a dynamo that involves physical stirring, like stirring a bowl with a giant spoon," Dwyer said.

Dwyer and her coauthors calculated the effects of differential motion between the moon's core and mantle. Early in its history, the moon orbited Earth at a much closer distance than it does today, and it continues to gradually recede from Earth. At close distances, tidal interactions between Earth and the moon caused the moon's mantle to rotate slightly differently than the core. This differential motion of the mantle relative to the core stirred the liquid core, creating fluid motions that, in theory, could give rise to a magnetic dynamo.

"The moon wobbles a bit as it spins--that's called precession--but the core is liquid, and it doesn't do exactly the same precession. So the mantle is moving back and forth across the core, and that stirs up the core," explained Nimmo, a professor of Earth and planetary sciences at UCSC.

The researchers found that a lunar dynamo could have operated in this way for at least a billion years. Eventually, however, it would have stopped working as the moon got farther away from Earth. "The further out the moon moves, the slower the stirring, and at a certain point the lunar dynamo shuts off," Dwyer said.

Rocks can become magnetized from the shock of an impact, a mechanism some scientists have proposed to explain the magnetization of lunar samples. But recent paleomagnetic analyses of moon rocks, as well as



orbital measurements of the magnetization of the lunar crust, suggest that there was a strong, long-lived magnetic field on the moon early in its history.

"One of the nice things about our model is that it explains how a lunar dynamo could have lasted for a billion years," Nimmo said. "It also makes predictions about how the strength of the field should have changed over the years, and that's potentially testable with enough paleomagnetic observations."

More detailed analysis is needed, however, to show that stirring of the core by the mantle would create the right kind of fluid motions to generate a magnetic field. "Only certain types of fluid motions give rise to magnetic dynamos," Dwyer said. "We calculated the power that's available to drive the dynamo and the magnetic field strengths that could be generated. But we really need the dynamo experts to take this model to the next level of detail and see if it works."

A working model of a lunar dynamo, combined with more detailed paleomagnetic analysis of moon rocks, could give scientists a powerful tool for investigating the history of the moon, Dwyer said. In addition, the study presents a novel mechanism for generating a magnetic field not only on the moon, but also on other small bodies, including large asteroids.

Story Source:

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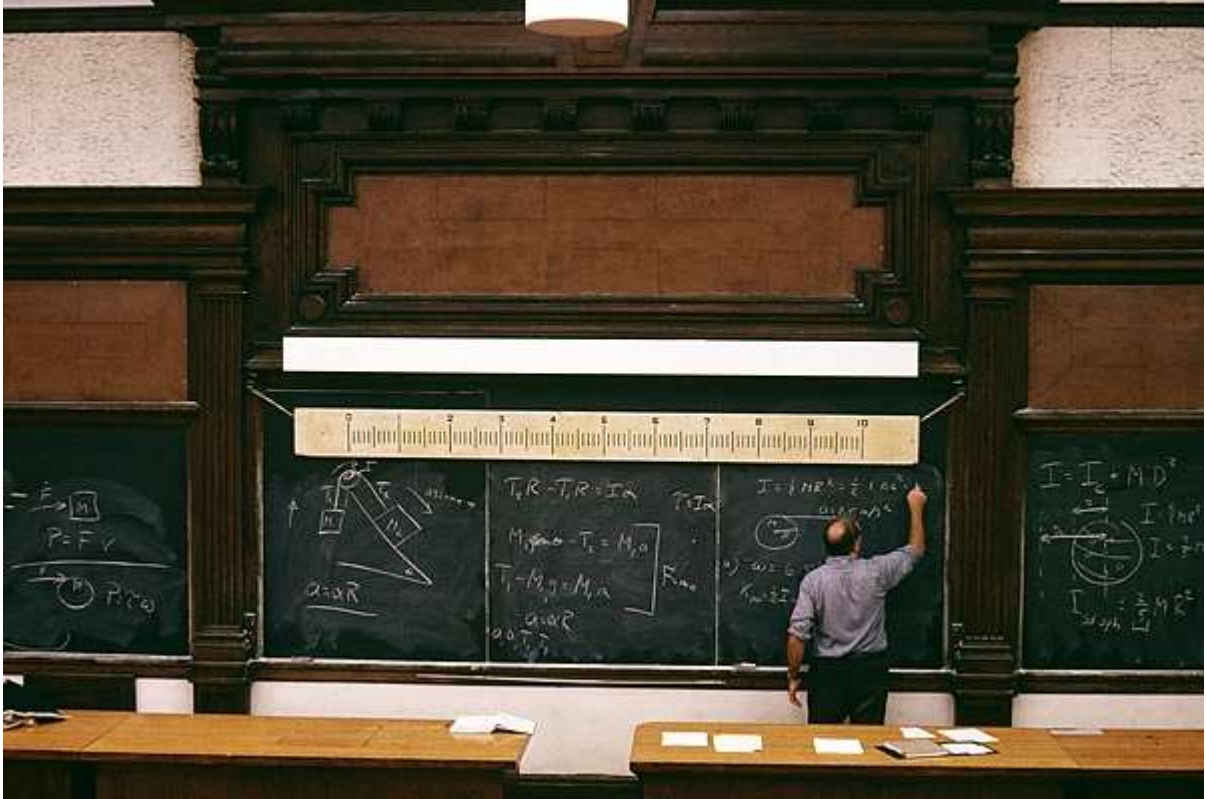
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How Should We Pay Teachers?

Do they earn too little — or too much? The pay question has no easy answers

By [Andrew J. Rotherham](#) | [@arotherham](#) | November 10, 2011 | [2](#)



Ira Block / National Geographic / Getty Images

Listen to the pundits, and public education has a Goldilocks problem. Are teachers being overpaid, underpaid or paid just right? Few arguments in education are as contentious — or as misleading. A report released Nov. 1 by two conservative think tanks, the American Enterprise Institute and the Heritage Foundation, set off fireworks with the claim that teachers are overpaid by a collective \$120 billion each year and that their pensions, health care and other benefits make their total compensation 52% higher than “fair market levels.”

The report looked at a variety of factors to reach its conclusion. Some are well known issues; for instance, teachers enjoy more generous benefits than most workers. But the analysis also rested on a variety of debatable assumptions about the quality of the teaching force, the job security that teachers have and opportunities for teachers in the private sector. Only by accepting all of the authors’ assumptions do you reach the eye-popping \$120 billion figure.

Not surprisingly, teachers’ unions blasted the report, and conservatives saw its findings as further evidence that the unions are putting one over on the American people. Mostly lost in the back and forth was the more complex reality of teacher pay. Here are three important factors that need to be considered:

Geography: Teacher salaries are set locally, and there’s a wide variation between wealthy and poor districts. At the high end, a first-year teacher with a bachelor’s degree in Virginia’s suburban Fairfax County earns \$44,440 for a 194-day contract (for most professionals, the work year is about 250 days). Salary rises a little if additional responsibilities are taken on, like coaching a team or supervising a club. Given the high cost of



living in Fairfax, which is right outside Washington, these first-year teachers are not one-percenters jetting off to Martha's Vineyard for vacation. But in many communities, if teachers stick with the profession for 20 years or more and marry another teacher who does the same, they'll find their way into the top fifth of U.S. household incomes. Not too shabby.

Drive an hour south, however, to Virginia's rural Madison County, and the starting salary for a teacher with a bachelor's degree is \$37,000; over the next 19 years, it will slowly rise to \$44,000. That's a tough sell, even when you account for Madison's lower cost of living. And around the country there are more Madisons than Fairfaxes.

Subject matter: Unlike most fields, where there are differences in compensation for different kinds of skills, teachers are overwhelmingly paid through a lock-step system called "steps and lanes." Steps are years of service and lanes are earned degrees. This sounds sensible except ample research shows that higher degrees are not a proxy for greater effectiveness in the classroom. And while most professions pay some premium for experience, the evidence is clear that after a few years of teaching, the relationship between experience and effectiveness isn't strong enough to be the overwhelming determinant of pay it is now.

This system also doesn't take into account basic issues of supply and demand. Schools struggle to find math, science, special-education and foreign-language teachers, but pay these all too rare creatures the same salaries as teachers of subjects for which there are plenty of qualified applicants. And while the conversation makes many uncomfortable, we have to start asking whether it makes sense to pay physics teachers and physical education teachers exactly the same. Not because one subject is more important than another, but because one kind of teacher is more plentiful than the other.

Total compensation: One thing teachers have in common with CEOs and Wall Street types is that their annual salary leaves out a lot of what they are actually earning. Discussions about teacher pay often fail to account for the weeks they get off in the summer. And another significant difference is benefits. Generally speaking, teachers enjoy health benefits and retirement benefits — largely through traditional pensions — that are more generous than other workers. For example, earlier this year during the protests in Wisconsin, it was widely reported that the average salary of Milwaukee teachers was \$56,500. But University of Arkansas economist Bob Costrell looked at total compensation including benefits and found it was \$100,005. That's a lot more cheese.

Bottom line: Saying teachers are systematically overpaid or persistently underpaid not only obscures the reality of the education landscape, it ignores a key lever that policymakers could be using to improve teacher effectiveness, i.e., paying the good ones more. Today, as a country, we don't have the teaching force we need. Although raising salaries won't fully offset problems like lousy working conditions or inept management that repel many would-be teachers, pay is obviously one important tool to attract and retain great teachers.

So from where I sit, we should pay teachers more but we should also pay them differently. Linking those two issues seems the best way through the current logjam.

Rotherham, a co-founder and partner at the nonprofit Bellwether Education, writes the blog [Eduwonk](#). The views expressed are his own.

<http://ideas.time.com/2011/11/10/how-should-we-pay-teachers/?iid=op-article-latest>



Do Plants Perform Best With Family or Strangers? Researchers Consider Social Interactions



Population of interacting iris flowers. (Credit: Image courtesy of McMaster University)

ScienceDaily (Nov. 9, 2011) — In the fight for survival, plants are capable of complex social behaviours and may exhibit altruism towards family members, but aggressively compete with strangers.

A growing body of work suggests plants recognize and respond to the presence and identity of their neighbours. But can plants cooperate with their relatives? While some studies have shown that siblings perform best -- suggesting altruism towards relatives -- other studies have shown that when less related plants grow together the group can actually outperform siblings. This implies the group benefits from its diversity by dividing precious resources effectively and competing less.

A team from McMaster University suggests plants can benefit from both altruism and biodiversity but when these processes occur at the same time, it is difficult to predict the outcome.

"The greatest challenge for understanding plant social interactions is we can't interpret plant behaviours as easily as we do those of animals," explains Susan Dudley, an associate professor in the Department of Biology at McMaster. "Though we have shown plants change traits in the presence of relatives, we need to determine if this is cooperation. Linking the plant behaviours with their benefits is challenging when multiple processes co-occur."

Dudley and a team of researchers disentangle the sometimes contradictory research in the latest edition of the *Proceedings of the Royal Society B*, describing how the identity and presence of neighbours affect many processes acting on plant populations.

The problem, she says, is that plant social interactions are treated as a black box, with researchers only looking at the output, or the fitness of the plant, in sibling competition. But they need to investigate the mechanisms *inside* the box -- by describing how traits of individuals affect fitness -- to understand how the output is reached and which mechanisms are occurring to get there.

"Simply put, social environment matters to plants. If we first acknowledge that kin cooperation and resource partitioning are co-occurring, we can begin to address some very important questions," says Amanda File, a graduate student in the Department of Biology at McMaster.



"Among these questions is whether there is a link between kin recognition and plant performance, whether plant kin recognition can improve crop yield and how kin recognition shapes communities and ecosystems" says Guillermo Murphy, a graduate student in the Department of Biology at McMaster.

Story Source:

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

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

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A Long, Strange "Trip to the Moon"

BY Ari Karpel Thu Nov 3, 2011

It took science, faith, and a bit of magic (oh, and 10 years and a million bucks) to bring a lost version of a pioneering silent film classic back to colorful life. Here's how it happened.



When Serge Bromberg learned that a color version of Georges Méliès' 16-minute silent film *Le Voyage dans la Lune* (*A Trip to the Moon*)--a rendering that had not been seen in almost a century--had been found in Barcelona, he had to have it. That the celluloid relic had deteriorated into a solid decomposed mass and was damaged beyond all likely repair only made the film preservationist's resolve deeper. "When you have a piece of the Holy Grail in your hand," declares Bromberg, in a phone call from Paris, "you say, We have to save it!"

So he did. A decade later, Bromberg is putting the finishing touches on *The Extraordinary Voyage*, a documentary that chronicles both the making of Méliès' groundbreaking 1902 film and the meticulous, against-all-odds process of restoring it to its full-color glory. The documentary, which closes with the color *A Trip to the Moon*, complete with a new soundtrack by the electronica group Air, will have its world premiere November 11 at New York City's Museum of Modern Art (the restored short itself debuted at the Cannes Film Festival earlier this year).

A distributor is being sought for an American theatrical release of the documentary (after all, no standard exists for showing a 16-minute silent film in theaters) and a Blu-ray release is anticipated for 2012, but the



project isn't going to gross anyone millions. It was done for the love of the art of film and an appreciation for the wonder of filmmaking, much like the wonder that prompted Melies to make what many consider the first sci-fi film, about humans flying to the moon at a time when the new medium was mostly devoted to very real-world events, like trains going into tunnels.

The MoMA premiere culminates a 10-year process that took roughly a million dollars and a faith in technology to render a cinematic feat that even the most seasoned experts had deemed impossible. "It's just sheer bravado to think you can pull that off," says Tom Burton, director of restoration services at Technicolor, who came on board a year ago for the final stage of restoration. "It was a gamble," concedes Bromberg, who came into possession of the film in 1999 and began a risky 14-month chemical process on it in February 2001. The film was placed in a humidior where the chemicals' vapors prompted the celluloid to unpeel itself. The chemicals were also destroying the film in the process, making the endeavor a race to get each image digitized in order to recreate Melies' hand-painted film frame by frame before the original film was gone forever. (Bromberg will not reveal the exact nature of the chemicals.)

Little by little, technicians broke the mass apart, revealing individual frames that were then shot digitally and stored on CD in multiple locations for safekeeping while Bromberg and his Lobster Films colleague Eric Lange sought money to complete the restoration. Funding eventually came from Groupama Gan Foundation, a French bank and insurance company and, later, from Technicolor, also based in France, which specializes in restorations.

"This is cinematic altruism at its best," says Burton, who works for Technicolor in Hollywood, where he has overseen such high-profile film restorations as *The Little Mermaid*, *Breakfast at Tiffany's*, and *Mr. Hulot's Holiday*. "They did it for the art and for film heritage, not for a high-profit Blu-ray release," as is the case with most of his projects. When the digital files came to Burton, he was charged with piecing together a rather complex puzzle. "It was pretty overwhelming at the beginning. 'How in the hell are we going to figure out the order?'" It was a mishmash of full frames, half frames, many of them multiples and in a variety of file formats. His team searched for what he calls the "hero" images, those with the best sharpness, the best color, and the most stable images, to anchor the resurrection.

To most moviegoers, Melies' image of a rocket landing in the eye of the man in the moon might be familiar, but his name is not. It's an obscurity the French filmmaker might soon shed. A fictionalized version of Melies, played by Ben Kingsley, has a central role in Martin Scorsese's *Hugo*, a 3-D film opening November 23 based on Brian Selznick's best-selling children's book of historical fiction, *The Invention of Hugo Cabret*.

"Some of my favorite scenes in the movie are these joyous images of life inside Melies' studio, where he's experimenting with this brand-new medium," says Selznick, marveling at Scorsese's knack for drawing in audiences with the film's primary story, about a boy, Hugo, whose father has died and who is living in hiding inside a train station. But the filmmaker has other messages to share. "What you're actually getting is this master class on the history of cinema from one of the greatest filmmakers of all time."

Like many people who post videos on YouTube today, Melies was pretty much a one-man operation. He designed the sets, created the costumes, and adapted the story from a Jules Verne novel, according to Selznick. Melies even played the leading character. What he didn't do was compose music. As far as we know, no score originally accompanied *A Trip to the Moon*. "It's an enigma," says Bromberg, who commissioned Air to write a score, an idea first proposed by Olivier Assayas, a friend and fellow French filmmaker who wrote and directed the Emmy winning miniseries *Carlos*. The move has been controversial. "Half of them say, 'It's a wonderful idea! So unusual!'" Bromberg reports, referring to film buffs. "The other half say, 'It is criminal! It is a tragedy!'" But we know that if Melies was around today maybe he would shoot it in 3-D."





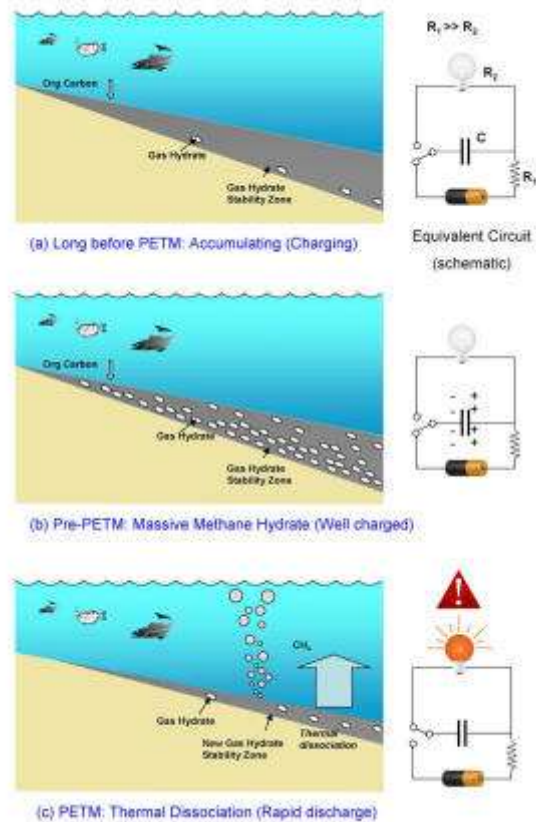
Bromberg justifies Air's funky score as a fleeting gimmick meant to interest younger people in the restored film. "The film has its own life without the Air music," he says. Melies did not earn much money off of his creation. "There were no royalties," explains Bromberg. "Once the print was sold to an exhibitor, he could show it as long as the print would run in the projector." Early films were mostly newsreels and travelogues, shown together at fairgrounds, not yet in proper cinemas. *Hugo* (and Selznick's book on which it is based) is set in 1931 and depicts Melies as bitter and alone, an emotional state that Selznick imagined based on research about Melies, who by that time had fallen into obscurity as technology passed him by; silent films had given way to talkies and his talents were no longer valued.

"I wanted my book to be an homage to the real Georges Melies," says Selznick, who's thrilled at the timely coincidence of Scorsese's film and the Melies restoration. "I think everybody has such inaccurate ideas about what silent movies were like because most of us only see little clips on TV or now on the computer. Usually the quality is really bad and it's something we think of as desperately old-fashioned. But going to see *A Trip to the Moon* in 1903 was like going to see *Avatar* [in 2009]. It blew your mind!"

<http://www.fastcompany.com/1792820/a-long-strange-trip-to-the-moon>



Methane May Be Answer to 56-Million-Year Question: Ocean Could Have Contained Enough Methane to Cause Drastic Climate Change



Research at Rice University bolstered a long-controversial theory that massive amounts of carbon from methane hydrate caused the Earth to warm 56 million years ago and drastically change the ecosystem. Rice scientists proposed in a new *Nature Geoscience* paper that hydrates collected in a narrower stability zone than today under the seafloor over millions of years were discharged rapidly as the planet warmed, much as an electrical capacitor gathers charge and releases it quickly. (Credit: Guangsheng Gu/Rice University)

ScienceDaily (Nov. 9, 2011) — The release of massive amounts of carbon from methane hydrate frozen under the seafloor 56 million years ago has been linked to the greatest change in global climate since a dinosaur-killing asteroid presumably hit Earth 9 million years earlier. New calculations by researchers at Rice University show that this long-controversial scenario is quite possible.

Nobody knows for sure what started the incident, but there's no doubt Earth's temperature rose by as much as 6 degrees Celsius. That affected the planet for up to 150,000 years, until excess carbon in the oceans and atmosphere was reabsorbed into sediment.

Earth's ecosystem changed and many species went extinct during the Paleocene-Eocene Thermal Maximum (PETM) 56 million years ago, when at least 2,500 gigatonnes of carbon, eventually in the form of carbon dioxide, were released into the ocean and atmosphere. (The era is described in great detail in a recent National Geographic feature.)

A new report by Rice scientists in *Nature Geoscience* suggests that at the time, even though methane-containing gas hydrates -- the "ice that burns" -- occupied only a small zone of sediment under the seabed before the PETM, there could have been as much stored then as there is now.

This is a concern to those who believe the continued burning of fossil fuels by humans could someday trigger another feedback loop that disturbs the stability of methane hydrate under the ocean and in permafrost; this change could warm the atmosphere and prompt the release of large amounts of methane, a more powerful greenhouse gas than carbon dioxide.

Some who study the PETM blame the worldwide burning of peat, volcanic activity or a massive asteroid strike as the source of the carbon, "but there's no crater, or any soot or evidence of the burning of peat," said Gerald Dickens, a Rice professor of Earth science and an author of the study, who thinks the new paper bolsters the argument for hydrates.

The lead author is graduate student Guangsheng Gu; co-authors are Walter Chapman, the William W. Akers Professor in Chemical Engineering; George Hirasaki, the A.J. Hartsook Professor in Chemical Engineering; and alumnus Gaurav Bhatnagar, all of Rice; and Frederick Colwell, a professor of ocean ecology and biogeochemistry at Oregon State University.

In the ocean, organisms die, sink into the sediment and decompose into methane. Under high pressure and low temperatures, methane molecules are trapped by water, which freezes into a slushy substance known as gas hydrate that stabilizes in a narrow band under the seafloor.

Warmer oceans before the PETM would have made the stability zone for gas hydrate thinner than today, and some scientists have argued this would allow for much less hydrate than exists under the seafloor now. "If the volume -- the size of the box -- was less than today, how could it have released so much carbon?" Dickens asked. "Gu's solution is that the box contains a greater fraction of hydrate."

"The critics said, 'No, this can't be. It's warmer; there couldn't have been more methane hydrate,'" Hirasaki said. "But we applied the numerical model and found that if the oceans were warmer, they would contain less dissolved oxygen and the kinetics for methane formation would have been faster."

With less oxygen to consume organic matter on the way down, more sank to the ocean floor, Gu said, and there, with seafloor temperatures higher than they are today, microbes that turn organic matter into methane work faster. "Heat speeds things up," Dickens said. "It's true for almost all microbial reactions. That's why we have refrigerators."

The result is that a stability zone smaller than what exists now may have held a similar amount of methane hydrate. "You're increasing the feedstock, processing it faster and packing it in over what could have been millions of years," Dickens said.

While the event that began the carbon-discharge cycle remains a mystery, the implications are clear, Dickens said. "I've always thought of (the hydrate layer) as being like a capacitor in a circuit. It charges slowly and can release fast -- and warming is the trigger. It's possible that's happening right now."

That makes it important to understand what occurred in the PETM, he said. "The amount of carbon released then is on the magnitude of what humans will add to the cycle by the end of, say, 2500. Compared to the geological timescale, that's almost instant."

"We run the risk of reproducing that big carbon-discharge event, but faster, by burning fossil fuel, and it may be severe if hydrate dissociation is triggered again," Gu said, adding that methane hydrate also offers the



potential to become a valuable source of clean energy, as burning methane emits much less carbon dioxide than other fossil fuels.

The calculations should encourage geologists who discounted hydrates' impact during the PETM to keep an open mind, Dickens said. "Instead of saying, 'No, this cannot be,' we're saying, 'Yes, it's certainly possible.'"

The United States Department of Energy supported the research.

Story Source:

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

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

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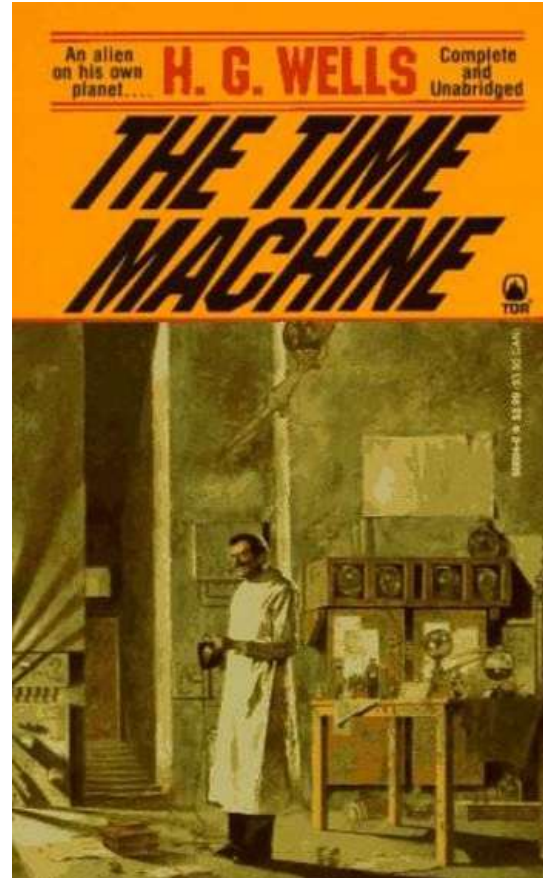
<http://www.sciencedaily.com/releases/2011/11/111109111542.htm>



A Brief History of Time Travel Literature

12:30 pm Wednesday Nov 9, 2011 by Emily Temple

Yesterday, Stephen King's newest work, *11/22/63*, a novel about a man who travels back in time via a storeroom to stop the JFK assassination, hit shelves. Inspired by this newest addition to the time travel literature genre, we got to thinking about a few of our favorite time travel stories, and particularly about all of the different ways those fictional mortals manage to thrust themselves back and forth in space-time. From our vantage, there are a few types of time travel that we see used over and over again: mechanical (time machines and the like), portal-based (stepping through some sort of floating hole in the space-time continuum), fantastical (ghosts or other unbelievable phenomena), magical/item-based (some sort of artifact that holds the power of time travel), and the simply unexplained (because why does it matter? Get to the cool future stuff already). There are hundreds of novels and short stories about or involving time travel, so these are a few of our favorites, plucked both from the beginnings of the genre and from contemporary literature. Click through to read our list, and let us know your own favorite time travel novels — or time travel methods — in the comments.

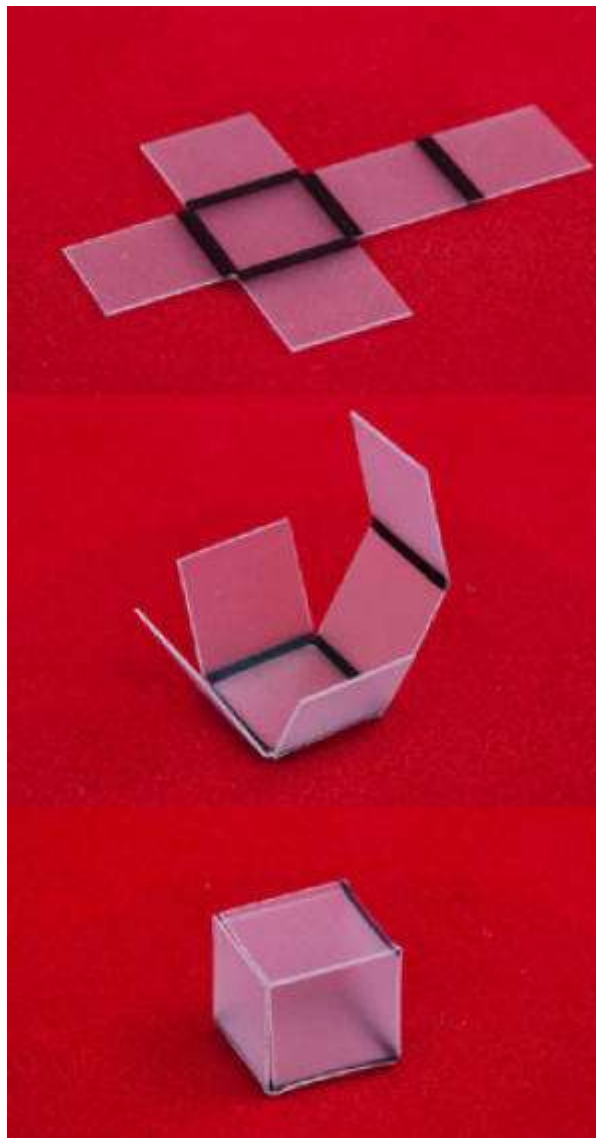


The Time Machine, H.G. Wells, 1895 – Mechanical

Though not the first instance of time travel in literature, and not even the first example of a time machine (that honor goes to Enrique Gaspar y Rimbau's 1887 novel *El Anacronopete*), this is the novel that really brought time travel to the forefront of the public's imagination. It makes sense, for while Wells didn't dream up the concept, he did coin the term 'time machine,' and he also was the first to cement the idea of a machine that allows the user to travel back and forward purposefully, as opposed to randomly.

<http://flavorwire.com/229209/a-brief-history-of-time-travel-literature>

Using Light, Researchers Convert 2-D Patterns Into 3-D Objects



The new technique can be used to create a variety of objects, such as cubes or pyramids, without ever having to physically touch the material. (Credit: Image courtesy of North Carolina State University)

ScienceDaily (Nov. 10, 2011) — Researchers from North Carolina State University have developed a simple way to convert two-dimensional patterns into three-dimensional (3-D) objects using only light.

"This is a novel application of existing materials, and has potential for rapid, high-volume manufacturing processes or packaging applications," says Dr. Michael Dickey, an assistant professor of chemical and biomolecular engineering at NC State and co-author of a paper describing the research.

The process is remarkably simple. Researchers take a pre-stressed plastic sheet and run it through a conventional inkjet printer to print bold black lines on the material. The material is then cut into a desired pattern and placed under an infrared light, such as a heat lamp.



The bold black lines absorb more energy than the rest of the material, causing the plastic to contract -- creating a hinge that folds the sheets into 3-D shapes. This technique can be used to create a variety of objects, such as cubes or pyramids, without ever having to physically touch the material. The technique is compatible with commercial printing techniques, such as screen printing, roll-to-roll printing, and inkjet printing, that are inexpensive and high-throughput but inherently 2-D.

By varying the width of the black lines, or hinges, researchers are able to change how far each hinge folds. For example, they can create a hinge that folds 90 degrees for a cube, or a hinge that folds 120 degrees for a pyramid. The wider the hinge, the further it folds. Wider hinges also fold faster, because there is more surface area to absorb energy.

"You can also pattern the lines on either side of the material," Dickey says, "which causes the hinges to fold in different directions. This allows you to create more complex structures."

The researchers developed a computer-based model to explain how the process works. There were two key findings. First, the surface temperature of the hinge must exceed the glass transition temperature of the material, which is the point at which the material begins to soften. Second, the heat has to be localized to the hinge in order to have fast and effective folding. If all of the material is heated to the glass transition temperature, no folding will occur.

"This finding stems from work we were doing on shape memory polymers, in part to satisfy our own curiosity. As it turns out, it works incredibly well," Dickey says.

The paper, "Self-folding of polymer sheets using local light absorption," was published Nov. 10 in the journal *Soft Matter*, and was co-authored by Dickey; NC State Celanese Professor of Chemical and Biomolecular Engineering Jan Genzer; NC State Ph.D. student Ying Liu; and NC State undergraduate Julie Boyles. The work was supported, in part, by the U.S. Department of Energy.

NC State's Department of Chemical and Biomolecular Engineering is part of the university's College of Engineering.

Story Source:

The above story is reprinted from materials provided by North Carolina State 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/2011/11/111110125846.htm>



Can Silicon Valley and Detroit Reinvent the Car Business?

Detroit has a lot to learn from Silicon Valley, but Silicon Valley should take notes too

By [Ron Bloom](#) | November 10, 2011 | [±](#)



Stephen Morton / Bloomberg / Getty Images

Ford Motor 2011 Explorer XLT sport-utility vehicles parked at an export terminal in Brunswick, Georgia, on August 2, 2011.

In the month of October, General Motors, Ford and Chrysler once again increased their share of cars and light trucks sold in America. In the third quarter of this year, the companies all reported solid profits. In fact, for the 12 months that just ended, their net income totaled \$13 billion — compared to losses of that size and more just three years ago. None can dispute that this qualifies as one of the most remarkable turnarounds in corporate history.

But while we enjoy the glow of success, it is worth looking ahead and asking whether this good fortune has legs. A dozen years from now, will these companies still be moving forward or will they be swept away by the seemingly inexorable tide of globalization? The prize here is large — keeping America as a prime location for the millions of jobs associated with making cars.

It is a tall order. We need a combination of good government policy, including a level playing field with our global trading partners and visionary leadership from corporate executives and labor leaders. But if we have these and combine them with the natural assets America brings to this challenge, this is a game that we can win.

Here's why. I believe that in next decade, the automobile industry will see more change than it has in the last 50 years — fundamental changes in how cars are powered, perform and are made.



For almost 100 years, the energy to power cars has come almost exclusively from oil and the amount of oil required to move a car a given distance has decreased at a very slow rate. In the next decade, substantial steps could be taken toward using electricity, bio-fuels and natural gas to power our cars, while those vehicles still using oil will consume far less of it.

For the last 50 years, we have slowly been placing more technology into our cars. Cars today are far smarter than they were 50 or even five years ago. However, the next dozen years will likely see an exponential expansion of a car's ability to interact with its driver and its environment.

Finally, we will see dramatic changes in the way that we manufacture cars. Our production methods today are still largely based on the methods developed by Henry Ford, but we are fast moving to a world of customized, on-demand manufacturing where the consumer can build their car from the ground up, sending their plans directly to the factory floor for rapid assembly.

Done right, these changes all play to our nation's greatest strength — our inexhaustible supply of brains and skilled labor, of innovators, inventors, entrepreneurs and investors, that incredible brew of vision and drive that have made this the best place in the world to build a company that changes the world. The car industry is being reinvented. And inventing new things and reinventing old ones is what we do in America.

Most people think that spirit is best exemplified by Silicon Valley, where they seem to reinvent the entire world every 18 months. Gordon Moore, the visionary founder of Intel, once suggested that if the auto industry advanced at the rate of the semiconductor industry, cars would soon get 100,000 miles per gallon and it would cost more to park a Rolls Royce than to buy one. Yes, the price of a gigabyte of memory marches inexorably down. But we would be more than a little surprised if our car regularly told us that it had a "fatal error" and that "the system will now shut down."

(MORE: [Car-Buying Help: 5 Smart Resources To Get The Right Car at the Right Price](#))

For while Silicon Valley brings us rapid innovation, Detroit brings us unflinching reliability. Whether it is 4° in Fargo or 107° in Phoenix, we expect our cars to run. We also expect our cars to last. In the past decade many people have purchased four, five or maybe six cell phones. But the overwhelming majority of cars manufactured a decade ago are today still on the road and still performing as expected.

There is no doubt that Detroit has much to learn from Silicon Valley, but Silicon Valley has much to learn from Detroit. The good news is that this combination is truly only available in America.

Bloom, a former investment banker and union official, served at the Treasury Department as head of the President's Auto Task Force and at the White House as Assistant to the President for Manufacturing Policy. The views expressed are his own.

Read more: <http://ideas.time.com/2011/11/10/can-silicon-valley-and-detroit-reinvent-the-car-business/#ixzz1dKyTUvJK>



'Fishy Lawnmowers' Help Save Pacific Corals



Crown-of-thorns sea star feeding on a coral. (Credit: Image courtesy of University of California - Santa Barbara)

ScienceDaily (Nov. 10, 2011) — Can fish save coral reefs from dying? UC Santa Barbara researchers have found one case where fish have helped coral reefs to recover from cyclones and predators.

Coral reefs worldwide are increasingly disturbed by environmental events that are causing their decline, yet some coral reefs recover. UCSB researchers have discovered that the health of coral reefs in the South Pacific island of Moorea, in French Polynesia, may be due to protection by parrotfish and surgeonfish that eat algae, along with the protection of reefs that shelter juvenile fish.

The findings are published in a recent issue of the journal *PLoS ONE*. The UCSB research team is part of the Moorea Coral Reef Long-Term Ecological Research (MCR LTER) project, funded by the National Science Foundation.

In many cases, especially in the case of severely damaged reefs in the Caribbean, coral reefs that suffer large losses of live coral often become overgrown with algae and never return to a state where the reefs are again largely covered by live coral. In contrast, the reefs surrounding Moorea experienced large losses of live coral in the past -- most recently in the early 1980's -- and have returned each time to a system dominated by healthy, live corals.

"We wanted to know why Moorea's reefs seem to act differently than other reefs," said Tom Adam, first author, research associate with MCR LTER, and postdoctoral fellow at UCSB's Marine Science Institute. "Specifically, we wanted to know what ecological factors might be responsible for the dramatic patterns of recovery observed in Moorea."

The research team was surprised by its findings. The biomass of herbivores on the reef -- fish and other animals that eat plants like algae -- increased dramatically following the loss of live coral. "What was surprising to us was that the numbers of these species also increased dramatically," said Andrew Brooks, co-author, deputy program director of MCR LTER, and associate project scientist with MSI. "We were not simply seeing a case of bigger, fatter fishes -- we were seeing many more parrotfishes and surgeonfishes, all of whom happened to be bigger and fatter. We wanted to know where these new fishes were coming from."



The researchers also found that not all of the coral reefs around Moorea were affected equally by an outbreak of predatory crown-of-thorns sea stars or by cyclones. The crown-of-thorns sea stars did eat virtually all of the live coral on the barrier reef -- the reef that separates the shallow lagoons from the deeper ocean. However, neither the sea stars nor the cyclones had much impact on the corals growing on the fringing reef -- the reef that grows against the island.

"We discovered that these fringing reefs act as a nursery ground for baby fishes, most notably herbivorous fishes," said Brooks. "With more food available in the form of algae, the survivorship of these baby parrotfishes and surgeonfishes increased, providing more individuals to help control the algae on the fore reef. In effect, the large numbers of parrotfishes and surgeonfishes are acting like thousands of fishy lawnmowers, keeping the algae cropped down to levels low enough that there is still space for new baby corals to settle onto the reef and begin to grow."

A major reason the reefs in the Caribbean do not recover after serious disturbances is because these reefs lack healthy populations of parrotfishes and surgeonfishes, due to the effects of overfishing, explained Adam. "Without these species to help crop the algae down, these reefs quickly become overgrown with algae, a situation that makes it very hard for corals to re-establish themselves," he said.

Managers have tried to reverse the trend of overfishing through the creation of Marine Protected Areas (MPAs), where fishing is severely restricted or prohibited. "Our results suggest that this strategy may not be enough to reverse the trend of coral reefs becoming algal reefs," said Brooks. "Our new and very novel results suggest that it also is vital to protect the fringing reefs that serve as nursery grounds. Without these nursery grounds, populations of parrotfishes and surgeonfishes can't respond to increasing amounts of algae on the reefs by outputting more baby herbivores."

In short, the research team found that by using MPAs, managers can help protect adult fish, producing bigger, fatter fish. "But if you don't protect the nursery habitat -- the babies produced by these bigger fish, or by fish in other, nearby areas -- you can't increase the overall numbers of the important algae-eating fish on the reef," said Brooks.

According to the scientists, it appears that Moorea's reefs may recover. "One final bit of good news is that we are seeing tens of thousands of baby corals, some less than a half-inch in diameter, on the fore reefs surrounding Moorea," said Brooks.

MCR researchers will follow the coral reef recovery process over the next decade or more, in search of additional information that can aid managers of the world's coral reefs.

Additional co-authors are Russell J. Schmitt and Sally J. Holbrook of UCSB's Marine Science Institute and the Department of Ecology, Evolution, and Marine Biology; Peter J. Edmunds and Robert C. Carpenter of California State University, Northridge; and Giacomo Bernardi, of UC Santa Cruz.

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/2011/11/111110130100.htm>



Personality on the Page

Human histories are noble undertakings, but too often the writer gets in the way.

By Jessa Crispin

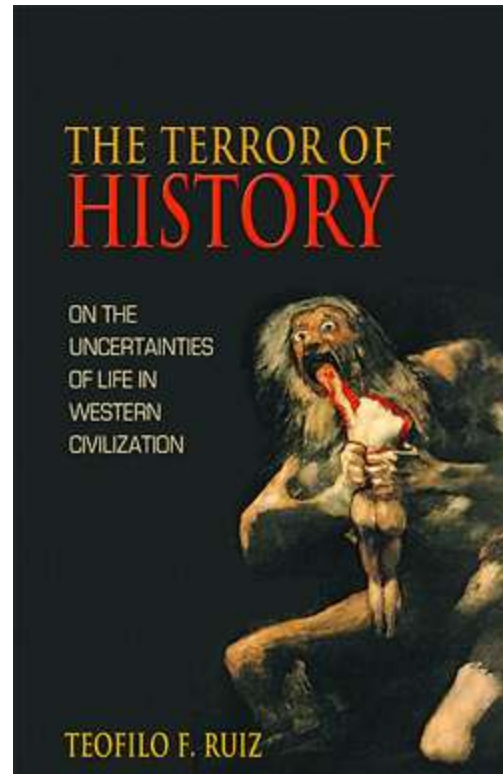
It was supposed to be a groundbreaking work of anthropology. And for the most part, it was. In 1890, Sir James Frazer unleashed the massive *The Golden Bough: A Study in Magic and Religion* into the world. It was the first work that collated worldwide, history-spanning religious and magical beliefs, and then sifted them through an analytic filter. The origins of certain myths and beliefs were revealed; behaviors that seemed idiosyncratic were found to fit global patterns; and the story of Jesus' crucifixion was shown to resemble many other stories of gods who were killed and resurrected three days later. The mysteries of religion could now be studied like any other realm of human behavior. Coming between Darwin and Freud, Frazer's work played an active part of the Western world's shift to the secular.

- ***The Terror of History: On the Uncertainties of Life in Western Civilization* by Teofilo F. Ruiz. 200 pages. Princeton University Press. \$24.95.**

It is also a deeply personal document. This fact is hard to catch at first. On a first reading, you are simply captivated by stories of shamans who maintain a supply of foreskins in case they need to bring on some rain, of tribes so reverential of trees that anyone who damaged one was likely to have his intestines wrapped around the wounded plant in apology. But perhaps sorting through so many superstitions and taboos, through so many senseless deaths and emotional and physical sufferings for illogical, irrational belief systems, started to get to Frazer. Maybe his despair started to seep into the material.

It starts with a few questionable statements about colonialism. "It is no mere accident that the most vehement outbursts of activity of the human mind have followed close on the heels of victory, and that the great conquering races of the world have commonly done most to advance and spread civilization, thus healing in peace the wounds they inflicted in war," Frazer writes. He makes much reference to "savage societies" in the colonies, and calls despotism "a friend" to human progress, as it is the fastest way to update a community into modernity. It's the kind of thing we cringe at today, but they can be forgiven in that vague way of, well, he was writing from late 19th-century Britain, before the atrocities committed in the name of empire were fully revealed and before we knew the long-term economic and social stunting that the colonies suffered. At the time, his were popular views.

Nonfiction is a tricky game. It would not be so if we were purely rational creatures, if we were able to keep all of our foul, weird, wriggly bits wrapped up at all times. All too often the scholar believes he is just offering an objective vision of the world, his own self comfortably absent from the text. But then the reader turns a corner, and the writer's neuroses are laid out for all to see, the writer himself often remaining unaware he's been stripped so bare.





Frazer was not the even-tempered anthropologist he believed himself to be, studying the world around him with a cold eye and a firm grasp of on his own prejudices and emotional state. His work includes heartbreaking passages about your average savage's realization that he is not in control of the world around him: the sun rises whether he is out there casting spells or not. It is easy to imagine that passages written with such an aching longing represent the metaphorical means through which Frazer dealt with the disillusionment process we all must go through as we journey deeper into adulthood and face our limitations. There are rantings about the stupidity of his fellow humans. ("We shall find underlying [the population of the intelligent and thoughtful] a solid stratum of... the dull, the weak, the ignorant, and the superstitious, who constitute, unfortunately, the vast majority of mankind.") And there is pure dread about what the future might bring, as political power is removed from the hands of the civilizing force of the British Empire, and as the stupid and the superstitious continue to breed and crowd out the intellectually refined.

You spend so much time with Frazer (more than 900 pages in my edition) that you come to empathize with the man. He was certainly not the only person who vocalized such views — this was the dawning of the age of eugenics as a fashionable cause. Social programs were disasters, and a large percentage of the population of the United Kingdom was living in squalid poverty. Foreign policy in Europe continued to be tense — the groundwork for World War I was slowly being laid. Reading Frazer, I felt an immense affection for him in the same way I feel affection for my grandfather when he is talking politics that I wholeheartedly disagree with. I can understand the world Frazer lived in, with its start/stop progress, its upheaval and tumult, and I can imagine that the future must have looked terrifying to him. I doubt he realized just how much of his psyche he revealed in the pages of *The Golden Bough*, but his intellect and his prose are so tremendous that the politics become simply a minor distraction, even if you just want stories of bloody Bacchic celebrations.

But I had a hard time finding any sympathy for Teofilo Ruiz while reading *The Terror of History: On the Uncertainties of Life in Western Civilization*. Ruiz follows Frazer's model pretty well, offering up a historical document with a helping of his own personal problems on the side. The book ostensibly explores how men and women throughout time have dealt with the immense weight of living in a world with incredible suffering and pain — through religious belief, through art and aesthetics, through decadence and hedonism. Like Frazer, he tracks particular behaviors to find their universality. For example, some of the citizenry responded to the Black Death that killed half the population around them by imagining they were being punished by God and tried to make amends. Others decided to eat, drink and screw until the end came for them. And then others wrote a collection of tales about a society trying to function amid the backdrop of plague and terror and called it the *Decameron*.

If Ruiz is writing about humans' avoidance behavior, looking for all the ways we manage not to take responsibility for the state of the world, he is doing so with a significant amount of judgment. The word "avoidance" does not have a positive connotation, nor does "removal" or "ahistorical," other words he uses instead of "coping strategy." For Ruiz, there is something shameful about these methods of distracting ourselves from what he sees as the "meaninglessness" of existence. The religious are particularly scorned, as Ruiz believes they use the promise of an afterlife to check out from the here and now. He somehow forgets that throughout history, Christianity was the one reason not to check out. To please God, it was important to be Christ-like, tend to the poor and watch over thy neighbor. For every saint and mystic who used a connection to God as a reason to live on a mountain away from the rest of humanity, there were un-cloistered nuns and monks, believers and preachers who did the dirty work of daily life to bring the Kingdom of Heaven down to Earth.

Like Frazer, Ruiz spills his guts all over his manuscript. Here is simply a small sampling of his particular issues:

page xiii: "God, or, as I may tend to say through this book, 'god'..."

page 18: "I, who claim to be a devoted atheist..."

page 36: "I slowly lost my faith during my 20s and have remained for the last four decades a devoted atheist..."





page 39: "Science cannot disprove the existence of god (although it may show the irrationality of religion)..."

(I had to stop listing there; I was getting bored. Let me assure you that this verbal tic continues throughout.)

Frazer held the religious as superior over the magical. Magic was superstitious, but religion was a higher state. Ruiz takes that further — religion is an emotional crutch, an "attempt to step out of historical processes, to escape the crushing reality of everyday expectations," and pure rational atheism is not only a more honest belief system, but also a more ethical way to go through life. But Ruiz is incapable of making the argument and letting it stand for itself. He keeps trying to shore it up, not aware that with all the fussing he's actually destabilizing it.

Most revealing is his repeated use of the word "devoted." It's such a strange word to couple with "atheist." It suggests the posture of head down, hands clamped over one's ears. It says that no matter what happens, no matter what one experiences or feels or intuitively needs, a devoted atheist will refuse to give oneself over to belief as that would be giving over to temptation and weakness. I'm not convinced this is a rational act. Agnosticism is at least an open, fluid, humane state of being. Pessimism, rigid disbelief, and a view of life as essentially meaningless is its own avoidance behavior. Frazer wrote that there is no true religious belief without action. Religion is (supposed to be) about engagement, not hiding or twisting away from life. Believing that we're all fucked no matter what, as Ruiz appears to think, is a way of avoiding reality, or at the very least, of refusing to be a part of the rehabilitation process.

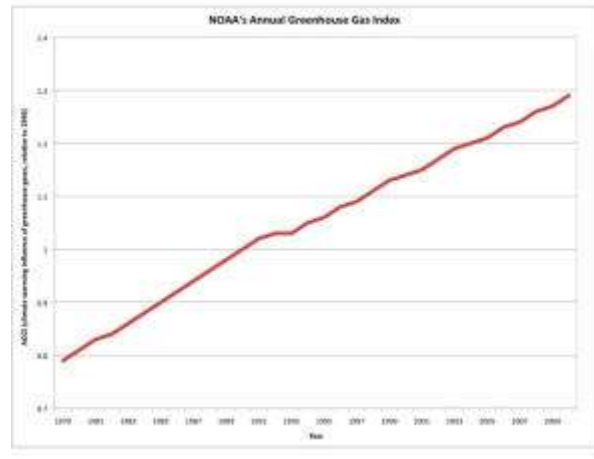
Frazer and Ruiz are working the same ground, although Ruiz obviously has a much less substantial set of tools. Humans are forever trying to find ways to dodge reality, or mold it, or understand it. Some use magic. Others use religion. Others use smug superiority, believing that they have it all figured out and everyone else is living under a delusion. Ruiz's time, our time, is just as tumultuous as Frazer's, is just as scary and just as dangerous. And a lot of that danger is cloaking itself in religious garb, it's true. Frazer mistook the violence of his age as being the work of ignorant, superstitious rabble, and not the result of stifling conditions under repressive governments and inhumane living conditions; similarly, Ruiz ignores the environment that gives this religious violence room to breathe. And if that strong, rational intellect is only capable of producing a removed, misguided examination of human nature, then what is it really good for? Ruiz might not be hiding from history, willing as he is to see the ugliness of our past. But by denying the greater forces at work, he is hiding from the potential of the future. • 8 November 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/article11081101.aspx>



Greenhouse Gas Index Continues to Climb



NOAA's Annual Greenhouse Gas Index is a gauge of the climate warming influence of greenhouse gases added to the atmosphere by human activities and compared with the "index" year of 1990. The AGGI shows a steady upward trend, reaching 1.29 in 2010. This means that the heating effect of additional greenhouse gases in the atmosphere has increased by 29 percent since 1990. (Credit: NOAA)

ScienceDaily (Nov. 9, 2011) — NOAA's updated Annual Greenhouse Gas Index (AGGI), which measures the direct climate influence of many greenhouse gases such as carbon dioxide and methane, shows a continued steady upward trend that began with the Industrial Revolution of the 1880s.

Started in 2004, the AGGI reached 1.29 in 2010. That means the combined heating effect of long-lived greenhouse gases added to the atmosphere by human activities has increased by 29 percent since 1990, the "index" year used as a baseline for comparison. This is slightly higher than the 2009 AGGI, which was 1.27, when the combined heating effect of those additional greenhouse gases was 27 percent higher than in 1990.

"The increasing amounts of long-lived greenhouse gases in our atmosphere indicate that climate change is an issue society will be dealing with for a long time," said Jim Butler, director of the Global Monitoring Division of NOAA's Earth System Research Laboratory in Boulder, Colo. "Climate warming has the potential to affect most aspects of society, including water supplies, agriculture, ecosystems and economies. NOAA will continue to monitor these gases into the future to further understand the impacts on our planet."

The AGGI is analogous to the dial on an electric blanket -- that dial does not tell you exactly how hot you will get, nor does the AGGI predict a specific temperature. Yet just as turning the dial up increases the heat of an electric blanket, a rise in the AGGI means greater greenhouse warming.

NOAA scientists created the AGGI recognizing that carbon dioxide is not the only greenhouse gas affecting the balance of heat in the atmosphere. Many other long-lived gases also contribute to warming, although not currently as much as carbon dioxide.

The AGGI includes methane and nitrous oxide, for example, greenhouse gases that are emitted by human activities and also have natural sources and sinks. It also includes several chemicals known to deplete Earth's protective ozone layer, which are also active as greenhouse gases. The 2010 AGGI reflects several changes in the concentration of these gases, including:



- **A continued steady increase in carbon dioxide:** Global carbon dioxide levels rose to an average of 389 parts per million in 2010, compared with 386 ppm in 2009, and 354 in the index or comparison year of 1990. Before the Industrial Revolution of the 1880s, carbon dioxide concentration in the atmosphere was about 280 ppm. Carbon dioxide levels swing up and down in natural seasonal cycles, but human activities -- primarily the burning of coal, oil, and gas for transportation and power -- have driven a consistent upward trend in concentration.
- **A continued recent increase in methane:** Methane levels rose in 2010 for the fourth consecutive year after remaining nearly constant for the preceding 10 years, up to 1799 parts per billion. Methane measured 1794 ppb in 2009, and 1714 ppb in 1990. Pound for pound, methane is 25 times more potent as a greenhouse gas than carbon dioxide, but there's less of it in the atmosphere.
- **A continued steady increase in nitrous oxide:** Best known as laughing gas in dentistry, nitrous oxide is also a greenhouse gas emitted from natural sources and as a byproduct of agricultural fertilization, livestock manure, sewage treatment and some industrial processes.
- **A continued recent drop in two chlorofluorocarbons, CFC11 and CFC12:** Levels of these two compounds -- which are ozone-depleting chemicals in addition to greenhouse gases -- have been dropping at about one percent per year since the late 1990s, because of an international agreement, the Montreal Protocol, to protect the ozone layer.

Scientists at NOAA's Earth System Research Laboratory prepare the AGGI each year from atmospheric data collected through an international cooperative air sampling network of more than 100 sites around the world.

NOAA researchers developed the AGGI in 2004 and have so far back calculated it to 1978. Atmospheric composition data from ice core and other records could allow the record to be extended back centuries.

The Annual Greenhouse Gas Index (AGGI) is available online at: <http://www.esrl.noaa.gov/gmd/aggi/>

Story Source:

The above story is reprinted from materials provided by **National Oceanic and Atmospheric Administration**.

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<http://www.sciencedaily.com/releases/2011/11/111109143007.htm>



Is High College Tuition Defensible?

Jason Gots on November 3, 2011, 12:00 AM



What's the Big Idea?

Bruce Bueno de Mesquita got a great higher education for free. In the glory days of the City University of New York, he graduated from Queens College with strong enough credentials to secure a full fellowship at the University of Michigan's PhD program in Political Science. Today, he is a professor at New York University and the well-known author of several books on game theory and the dynamics of political power.

Coming from an upper middle class family, de Mesquita says, he could have afforded to pay some tuition. Instead, he was the beneficiary of the tax dollars of New Yorkers who didn't send their kids to public institutions. Is that fair? Not so much, he argues.

The high tuition of private universities, de Mesquita says, is misleading, because few students actually pay it. He sees it as a way of attracting educationally ambitious students and creating a social networking pool that will benefit them in their careers. This, he says, is how private universities compete against public ones. Most private universities engage in "price discrimination" – reserving scholarships for students in financial need and making the de Mesquitas of this world pay a bit more. No free rides for the rich kids.

What's the Significance?

There are two intertwined questions here. 1) Does free market competition create better schools? and 2) How egalitarian is the "tuition discrimination" de Mesquita describes, really? Question one is playing out right now



in the public school system nationwide, as privately run (but free to students) charter schools compete with traditional public schools for students and resources. Enthusiastically embraced by educational policy makers and politicians, charter schools have had mixed academic outcomes so far, failing (on average) to improve reading and math scores significantly more than their public competitors. This does not definitively refute the “improvement through competition” argument, but it doesn’t support it, either.

With respect to question two, it is also arguable that the specter of high tuition drives away not only the less academically ambitious, but also the less wealthy – students from families without a long history of college attendance, or experience with scholarships and low-interest-rate loans. These students are more likely to consider a \$40,000 tuition categorically out of reach than those who can afford it, or those whose parents attended private universities at cost but now find themselves in reduced circumstances.

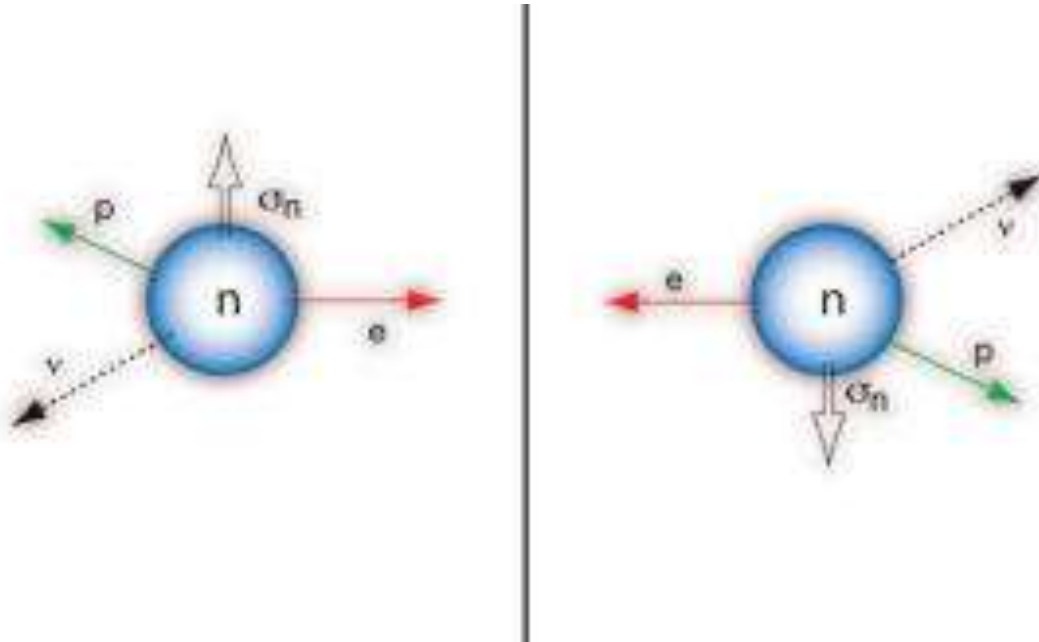
What is abundantly clear, however, is that the current models of higher education will be under close scrutiny for some time to come. Tuition discrimination or no, many students are graduating with enormous debt loads into a sagging economy. Educating students about student loans (“Know what you’re getting into, kid!”) is at best a halfhearted solution, given that the very existence of federal loans and their low interest rates are designed to encourage students to take them – and to boost their career prospects through higher education. It’s like giving away lollipops along with a flyer about dental care.

Private universities aren't likely to disappear any time soon, but the longer the economy lags, the more competition they'll face internally (from other schools) and externally (from alternate models, such as on-the-job training). The pressure to offer more affordable, high-quality educational options will become especially intense as online learning becomes an increasingly viable, sophisticated, and academically respectable option.

<http://bigthink.com/ideas/40935>



Physicists Chip Away at Mystery of Antimatter Imbalance



Two types of neutron decay produce a proton, an electron and an electron antineutrino but eject them in different configurations. The experiments at NIST detected no imbalance, but the improved sensitivity could help place limits on competing theories about the matter-antimatter imbalance in the universe. (Credit: emiT team)

ScienceDaily (Nov. 9, 2011) — Why there is stuff in the universe -- more properly, why there is an imbalance between matter and antimatter -- is one of the long-standing mysteries of cosmology. A team of researchers working at the National Institute of Standards and Technology (NIST) has just concluded a 10-year-long study of the fate of neutrons in an attempt to resolve the question, the most sensitive such measurement ever made. The universe, they concede, has managed to keep its secret for the time being, but they've succeeded in significantly narrowing the number of possible answers.

Though the word itself evokes science fiction, antimatter is an ordinary -- if highly uncommon -- material that cosmologists believe once made up almost exactly half of the substance of the universe. When particles and their antiparticles come into contact, they instantly annihilate one another in a flash of light. Billions of years ago, most of the matter and all of the antimatter vanished in this fashion, leaving behind a tiny bit of matter awash in cosmic energy. What we see around us today, from stars to rocks to living things, is made up of that excess matter, which survived because a bit more of it existed.

"The question is, why was there an excess of one over the other in the first place?" says Pieter Mumm, a physicist at NIST's Physical Measurements Lab. "There are lots of theories attempting to explain the imbalance, but there's no experimental evidence to show that any of them can account for it. It's a huge mystery on the level of asking why the universe is here. Accepted physics can't explain it."

An answer might be found by examining radioactivity in neutrons, which decay in two different ways that can be distinguished by a specially configured detector. Though all observations thus far have invariably shown these two ways occur with equal frequency in nature, finding a slight imbalance between the two would imply that nature favors conditions that would create a bit more matter than antimatter, resulting in the universe we recognize.



Mumm and his collaborators from several institutions used a detector at the NIST Center for Neutron Research to explore this aspect of neutron decay with greater sensitivity than was ever possible before. For the moment, the larger answer has eluded them -- several years of observation and data analysis once again turned up no imbalance between the two decay paths. But the improved sensitivity of their approach means that they can severely limit some of the numerous theories about the universe's matter-antimatter imbalance, and with future improvements to the detector, their approach may help constrain the possibilities far more dramatically.

"We have placed very tight constraints on what these theories can say," Mumm says. "We have given theory something to work with. And if we can modify our detector successfully, we can envision limiting large classes of theories. It will help ensure the physics community avoids traveling down blind alleys."

The research team also includes scientists from the University of Washington, the University of Michigan, the University of California at Berkeley, Lawrence Berkeley National Laboratory, Tulane University, the University of Notre Dame, Hamilton College and the University of North Carolina at Chapel Hill. Funding was provided by the U.S. Department of Energy and the National Science Foundation.

Story Source:

The above story is reprinted from materials provided by **National Institute of Standards and Technology (NIST)**.

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China Tries to Add Cultural Clout to Economic Muscle

By **MICHAEL WINES**



Shiho Fukada for The New York Times

An art exhibition this month at the Sunshine International Art Museum in Songzhuang, an artists' colony in suburban Beijing

BEIJING — Last month, the cream of the Communist Party leadership gathered here to proclaim a national effort to make China a cultural tastemaker, one whose global creative influence matches its economic clout. “A nation cannot stand among great powers,” the official party newspaper People’s Daily said on its front page, “without its people’s spiritual affluence and the nation’s full expression of its creativity.”

The question is how to square that goal with what just happened to Yue Luping.

Mr. Yue, a professional artist for more than 10 years, was preparing his works for an exhibition in the Shunyi District of north Beijing last month when government officials and police officers abruptly canceled the show.

The next day, he said, agents of the local Public Security Bureau interrogated him about one work, a collection of peppercorns arranged to form numbers. Security officers had already photographed the piece, studied it for an entire night and consulted cryptography experts to divine its message.

As they eventually discovered, the numbers were in a computer language, Unicode, spelling out five phrases that Chinese censors have banned from the results of Internet search engines. And the pungent peppercorns were a metaphor for what Mr. Yue called people’s undue sensitivity to ordinary words.



“It’s very ironic,” Mr. Yue, 36, said in an interview last week. “On the one hand, they want to boost cultural development. And on the other, they call off our exhibition.”

Ironic is one way to describe it. But viewed against the language of the party’s declaration on culture — the Oct. 25 report on the annual Central Committee plenum, held last month — there is not much inconsistency at all, some analysts say.

Rather, they suggest, the leaders’ approach to building a world-class culture is not all that different from the one that powered China’s economic miracle: set a long-term goal, adopt rigid specifications, pour in copious amounts of public money, monitor closely to ensure the desired result.

In this case, as the report repeatedly stated, the specifications are to adhere to “core socialist values” in cultural activities. The desired result is “to build our country into a socialist culture superpower.”

The monitoring affects artists like Mr. Yue and Yu Jianrong, a painter and photographer whose works — on the petitions prepared annually by thousands of ordinary Chinese whose grievances have been ignored by the government — were banned two weeks ago from being exhibited in Songzhuang, a suburban Beijing artists’ colony.

Mr. Yu declined to be interviewed. But The South China Morning Post in Hong Kong quoted a microblog post, since deleted, in which Mr. Yu wrote that exhibition officials in Songzhuang had told him that “the situation this year is tense, and no sensitive topics are allowed.”

Such tales show that there is nothing ironic about the current censorship, said Zhang Ming, a political science professor at Renmin University of China.

“The government is overconfident about controlling art,” he said. “They think as long as they provide money and they provide a value orientation, there can be good art produced. This is not surprising at all, because they have never experienced the process of free expression.”

In that view, the notion is lost on Chinese leaders that a great culture — whether in painting, science or journalism — rests on people’s abilities to push the boundaries of creativity, no matter whom it offends.

There is much to support that view, including the arrest in April of the internationally famous artist and dissident Ai Weiwei and the banning of literature like “The Fat Years,” Chan Koonchung’s bleak depiction of a China-dominated future.

Not a few officially approved commentaries cast Chinese culture as a sort of zero-sum contest with its rivals. Xinhua, the government news agency, described the challenge last month as an “international cultural competition,” in which controlling the world stage is one more hurdle to surmount in a triathlon toward global greatness.

“Chinese cultural companies have yet to produce a world-famous brand,” that commentary grouched, offering a litany of shortcomings: China’s television programs have an “embarrassing” export record; its total published literature does not approach the output of a single German firm, Bertelsmann.

Most embarrassing, the 1998 animated film “Mulan,” based on a Chinese heroine, was produced by the Walt Disney Studios in California. “China has yet to produce an animated film as internationally successful,” the commentary said.





There is an alternative view in the party's report last month on culture, one that hints at a less rigorous official stance. That view points to other snippets of the report — led, ironically, by a famous statement by Mao Zedong, the leader whose Cultural Revolution plunged China into years of repression and torment.

But before that, in 1956, Mao made a famous speech in which he summoned ordinary Chinese to speak out about their needs: "Let a hundred flowers bloom," he said, "and a hundred schools of thoughts contend."

The report repeated those words verbatim, citing them as a guiding principle for China's cultural development. Other passages call for an "opening and reform" in China's cultural development, echoing the economic approach to the rest of the world that spurred China's growth over the last two decades.

Liang Xiaosheng, an author and a government-appointed member of China's legislative advisory body, said last week that Mao's statement and other clauses in the report are a muted call for more artistic freedom, at least over the long haul.

"In China, the policy won't be quickly carried out because the executors need a digesting and understanding process," he said. "Even a small step for China may take as long as 10 years."

People here pay great attention to history. Mao's hundred-flowers campaign was a disaster. Freed to say their piece, intellectuals denounced government repression and incompetence, and party leaders quickly reverted to a crackdown on expression.

It may not be lost on the creative community that Mao quickly replaced his hundred-flowers campaign with an anti-rightist movement in which hundreds of thousands of intellectuals were stripped of their jobs, with many of them sent to labor camps. Mao later said he had been seeking to lure the snakes from their dens in order to cut off their heads.

In China, then as now, liberalization and crackdown reliably — and unpredictably — ebb and flow.

Free-thinking students spawned the Tiananmen Square demonstrations, which, in turn, provoked a new crackdown that has lasted to this day. Which may explain one genuine irony: when asked, some of the artists who organized the Shunyi and Songzhuang exhibitions chose to pretend that their colleagues were not censored at all.

Free-speech principles or not, some artists here appear to have no appetite for trouble.

"There is some misunderstanding going on," Shen Qibing, an organizer of the exhibition that was to have shown Mr. Yue's peppercorn art, said in a telephone interview. "The exhibition was called off because more and more artists are trying to sign up for the exhibition, and we feel we have a lot of work to do.

"I am the executive organizer," he said. "I know what is going on. Some of the artists try to exaggerate things."

Shi Da and Edy Yin contributed research.

http://www.nytimes.com/2011/11/08/world/asia/china-seeks-cultural-influence-to-match-economic-muscle.html?_r=2&partner=rss&emc=rss



New Method for Visualizing Mechanical Forces On Cell Surface



"Once a force is applied to the polymer, it stretches out," Salaita explains. "And as it extends, the distance from the quencher increases and the fluorescent signal turns on and grows brighter." (Credit: Graphic by Daniel Stabley.)

ScienceDaily (Nov. 9, 2011) — A new method for visualizing mechanical forces on the surface of a cell, reported in *Nature Methods*, provides the first detailed view of those forces, as they occur in real-time.

"Now we're able to measure something that's never been measured before: The force that one molecule applies to another molecule across the entire surface of a living cell, and as this cell moves and goes about its normal processes," says Khalid Salaita, assistant professor of biomolecular chemistry at Emory University. "And we can visualize these forces in a time-lapsed movie."

Salaita developed the fluorescent-sensor technique with chemistry graduate students Daniel Stabley and Carol Jurchenko, and undergraduate senior Stephen Marshall.

"Cells are constantly tugging and pushing on their surroundings, and they can even communicate with one another using mechanics," Salaita says. "One way that cells use forces is evident from the characteristic architecture of tissue, like a lung or a heart. If we want to really understand cells and how they work, we have to understand cell mechanics at a molecular level. The first step is to measure the tension applied to specific receptors on the cell surface."

The researchers demonstrated their technique on the epidermal growth factor receptor (EGFR), one of the most studied cellular signaling pathways. They mapped the mechanical strain exerted by EGFR during the early stages of endocytosis, when the protein receptor of a cell takes in a ligand, or binding molecule. The results showed that the cell does not passively absorb the ligand, but physically pulls it inside during the process. Their experiments provide the first direct evidence that force is exerted during endocytosis.

Mapping such forces may help to diagnose and treat diseases related to cellular mechanics. Cancer cells, for instance, move differently from normal cells, and it is unclear whether that difference is a cause or an effect of the disease.

"It's known that if EGFR is over-active, that can lead to cancer," Salaita says. "And one of the ways that EGFR is activated is by binding its ligand and taking it in. So if we can understand how tugging on EGFR



force changes the pathway, and whether it plays a role in cancer, it might be possible to design drugs that target this pulling process."

Several methods have been developed in recent years to try to study the mechanics of cellular forces, but they have major limitations.

One genetic engineering approach requires splitting open and modifying proteins of a cell. This invasive technique may change the behavior of the cell, skewing the results.

The technique developed at Emory is non-invasive, does not modify the cell, and can be done with a standard fluorescence microscope. A flexible polymer is chemically modified at both ends. One end gets a fluorescence-based turn-on sensor that will bind to a receptor on the cell surface. The other end is chemically anchored to a microscope slide and a molecule that quenches fluorescence.

"Once a force is applied to the polymer, it stretches out," Salaita explains. "And as it extends, the distance from the quencher increases and the fluorescent signal turns on and grows brighter. We can determine the force being exerted by measuring the amount of fluorescent light emitted."

The forces of any individual protein or molecule on the cell surface can be measured using the technique, at far higher spatial and temporal resolutions than was previously possible.

Many mysteries beyond the biology and chemistry of cells may be explained through measuring cellular forces. How does a cancer cell crawl when a tumor spreads? What are the forces involved in cell division and immune response? What are the mechanics that allow groups of cardiac cells to beat in unison?

"Our method can be applied to nearly any receptor, opening the door to rapidly studying chemical and mechanical interactions across the thousands of membrane-bound receptors on the surface of virtually any cell type," Salaita says. "We hope that measuring cellular forces could then become part of the standard repertoire of biochemical techniques that scientists use to study living systems."

Story Source:

The above story is reprinted from [materials](#) provided by [Emory University](#). The original article was written by Carol Clark.

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The Difference Between American and British Humour

Apart from the spelling of the word, obviously

By [Ricky Gervais](#) | [@rickygervais](#) | November 9, 2011 | 33



Left; NBC: Everett

It's often dangerous to generalize, but under threat, I would say that Americans are more "down the line." They don't hide their hopes and fears. They applaud ambition and openly reward success. Brits are more comfortable with life's losers. We embrace the underdog until it's no longer the underdog. We like to bring authority down a peg or two. Just for the hell of it. Americans say, "have a nice day" whether they mean it or not. Brits are terrified to say this. We tell ourselves it's because we don't want to sound insincere but I think it might be for the opposite reason. We don't want to celebrate anything too soon. Failure and disappointment lurk around every corner. This is due to our upbringing. Americans are brought up to believe they can be the next president of the United States. Brits are told, "it won't happen for you."

There's a received wisdom in the U.K. that Americans don't get irony. This is of course not true. But what is true is that they don't use it all the time. It shows up in the smarter comedies but Americans don't use it as much socially as Brits. We use it as liberally as prepositions in every day speech. We tease our friends. We use sarcasm as a shield and a weapon. We avoid sincerity until it's absolutely necessary. We mercilessly take the piss out of people we like or dislike basically. And ourselves. This is very important. Our brashness and swagger is laden with equal portions of self-deprecation. This is our license to hand it out.

This can sometimes be perceived as nasty if the recipients aren't used to it. It isn't. It's play fighting. It's almost a sign of affection if we like you, and ego bursting if we don't. You just have to know which one it is.

I guess the biggest difference between the U.S. version and the U.K. version of *The Office* reflected this. We had to make Michael Scott a slightly nicer guy, with a rosier outlook to life. He could still be childish, and insecure, and even a bore, but he couldn't be too mean. The irony is of course that I think David Brent's dark descension and eventual redemption made him all the more compelling. But I think that's a lot more palatable in Britain for the reasons already stated. Brits almost expect doom and gloom so to start off that way but then have a happy ending is an unexpected joy. Network America has to give people a reason to like you not just a



reason to watch you. In Britain we stop watching things like *Big Brother* when the villain is evicted. We don't want to watch a bunch of idiots having a good time. We want them to be as miserable as us. America rewards up front, on-your-sleeve niceness. A perceived wicked streak is somewhat frowned upon.

Recently I have been accused of being a shock comic, and cruel and cynical. This is of course almost solely due to a few comments I made as host of this years Golden Globes. But nothing could be further from the truth.

I never actively try to offend. That's churlish, pointless and frankly too easy. But I believe you should say what you mean. Be honest. No one should ever be offended by truth. That way you'll never have to apologize. I hate it when a comedian says, "Sorry for what I said." You shouldn't say it if you didn't mean it and you should never regret anything you meant to do. As a comedian, I think my job isn't just to make people laugh but also make them think. As a famous comedian, I also want a strict door policy on my club. Not everyone will like what I say or find it funny. And I wouldn't have it any other way. There are enough comedians who try to please everyone as it is. Good luck to them, but that's not my game, I'm afraid.

I'm not one of those people who think that comedy is your conscience taking a day off. My conscience never takes a day off and I can justify everything I do. There's no line to be drawn in comedy in the sense that there are things you should never joke about. There's nothing that you should never joke about, but it depends what that joke is. Comedy comes from a good or a bad place. The subject of a joke isn't necessarily the target of the joke. You can make jokes about race without any race being the butt of the joke. Racism itself can be the butt, for example. When dealing with a so-called taboo subject, the angst and discomfort of the audience is what's under the microscope. Our own preconceptions and prejudices are often what are being challenged. I don't like racist jokes. Not because they are offensive. I don't like them because they're not funny. And they're not funny because they're not true. They are almost always based on a falsehood somewhere along the way, which ruins the gag for me. Comedy is an intellectual pursuit. Not a platform.

As for cynicism, I don't care for it much. I'm a romantic. From *The Office*, and *Extras* to *The Invention Of Lying* and *Cemetery Junction*, goodness and sweetness, honour and truth, love and friendship always triumph.

For me, humanity is king.

Oh and for the record I'd rather a waiter say, "Have a nice day" and not mean it, than ignore me and mean it.

Gervais is a comedian, actor and producer. The views expressed are his own.

Read more: <http://ideas.time.com/2011/11/09/the-difference-between-american-and-british-humour/#ixzz1dKy5XljS>

<http://ideas.time.com/2011/11/09/the-difference-between-american-and-british-humour/>



Sea Change Can Forecast South American Wildfires



Brazilian rain forest is visible behind the smoke of an actively burning fire. (Credit: NASA/Doug Morton)

ScienceDaily (Nov. 10, 2011) — Tiny temperature changes on the Atlantic and Pacific oceans provide an excellent way to forecast wildfires in South American rainforests, according to UC Irvine and other researchers funded by NASA.

"It enables us three to five months in advance to predict the severity of the fire season," said UCI assistant project scientist Yang Chen, lead author of a paper that will be published on Nov. 11, in the journal *Science*.

Wildfires, once rare in tropical forests, have become a major threat to humans and biodiversity across an "arc of deforestation" in Brazil, Bolivia and Peru due to clear-cutting and agricultural burns. The study's authors said the new findings could aid fire and public health officials, planners issuing burn permits, and broader efforts to stem climate change. Rainforests are vital carbon dioxide storage basins, and woodlands consumed by fire across the southern continent are responsible for about a quarter of the greenhouse gases released from forests globally.

"This work has very clear implications for conserving tropical forests," said co-author James Randerson, UCI Earth system science professor. "During the 21st century, there are expectations that drought may intensify, and forests may become even more vulnerable. Understanding in advance whether you're going to have an exceptionally bad year will become critically important for managing them."

The prediction method is similar to that for storms. Just as sea surface temperatures can be harbingers of powerful Atlantic hurricanes or El Nino conditions that influence rainfall in California and elsewhere on the Pacific Rim, they can be used to model drought-inducing atmospheric changes. Utilizing archival satellite



data from NASA, Chen and fellow scientists painstakingly plotted a decade of water temperature variations and wildfire duration and intensity across central South America.

They found that temperature increases of as little as a quarter of a degree Celsius on the Atlantic and a single degree on the Pacific matched up with more deadly blazes across broad swaths of the Amazon over the next year.

"These changes are slight, but they trigger big effects in these tropical forest ecosystems," Chen said. Ocean temperatures affect atmospheric winds and clouds that can reduce or increase rainfall over the continent.

The scientists tested their theory by forecasting -- based on water temperature readings -- South America's 2010 fire season and then checking actual data afterward. Their accuracy was striking. Last year saw the biggest temperature increases on both oceans and, several months later, far drier conditions on land.

"We predicted a massive spike in fires in 2010, and it occurred," said Randerson, citing conflagrations across hundreds of miles. In one state, they had forecast worse fires than occurred, then learned later that officials there had sharply reduced clear-cutting the year before. Overall, while deforestation has declined in the past decade, wildfires have not because of prescribed farming burns that escape into nearby woods.

The scientists are compiling data for the 2012 fire season and plan to release their findings this winter for officials to use next year. The next step will be to see if the prediction method works for forests in Siberia, Indonesia and West Africa.

Other co-authors of the paper were Yufang Jin of UCI; George Collatz and Douglas Morton of NASA's Goddard Space Flight Center; Ruth DeFries and Miriam Marlier of Columbia University; Prasad S. Kasibhatla of Duke University; and Louis Giglio of the University of Maryland.

Story Source:

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<http://www.sciencedaily.com/releases/2011/11/1111110142054.htm>



Consciousness: The Black Hole of Neuroscience

Megan Erickson on November 6, 2011, 12:00 AM



What's the Big Idea?

"By the word 'thought' ('pensée') I understand all that of which we are conscious as operating in us." – Renee Descartes

The simplest description of a black hole is a region of space-time from which no light is reflected and nothing escapes. The simplest description of consciousness is a mind that absorbs many things and attends to a few of them. Neither of these concepts can be captured quantitatively. Together they suggest the appealing possibility that endlessness surrounds us and infinity is within.

But our inability to grasp the immaterial means we're stuck making inferences, free-associating, if we want any insight into the unknown. Which is why we talk obscurely and metaphorically about "pinning down" perception and "hunting for dark matter" (possibly a sort of primordial black hole). The existence of black holes was first hypothesized a decade after Einstein laid the theoretical groundwork for them in the theory of relativity, and the phrase "black hole" was not coined until 1968.

Likewise, consciousness is still such an elusive concept that, in spite of the recent invention of functional imaging - which has allowed scientists to visualize the different areas of the brain - we may not understand it any better now than we ever have before. "We approach [consciousness] now perhaps differently than we have in the past with our new tools," says neuroscientist Joy Hirsch.

"The questions [we ask] have become a little bit more sophisticated and we've become more sophisticated in how we ask the question," she adds - but we're still far from being able to explain how the regions of the brain interact to produce thought, dreams, and self-awareness. "In terms of understanding, the awareness that comes from binding remote activities of the brain together, still remains what philosophers call, 'The hard problem.'"

What's the Significance?



Discovering how mechanistic processes work - the firing of neurons or the earth revolving around the sun, for example - is considered by some to be an "easy" problem because it involves observation, the description of an event from a third person point of view. "Hard" problems, on the other hand, involve first person experience. They're the questions that persist even after physical processes have been mapped and explained.

It's tempting to see them as universal to humanity, but whether and how they've been framed has varied historically. Historians of philosophy have observed there was no ancient Greek word that corresponds to "consciousness," while the modern Western perspective on consciousness seems to have been developed during the Reformation era - the age of "I think, therefore I am," and "To be or not to be." (*Hamlet* was written around 1600, and Rene Descartes' *Discourse on the Method* was published in 1637.)

So there's no reason to assume that consciousness is eternally inexplicable. However, it may never be explained through neurobiology, says David Chalmers, the philosopher who originally made the distinction. "In so many other fields physical explanation has been successful... but there seems to be this big gap in the case of consciousness," he says. "It's just very hard to see how [neurological] interactions are going to give you subjective experience."

Hirsch sees it more practically. Though functional imaging has not explained where perception comes from, it has important applications for unconscious patients. "The boundaries have been broken a little bit, clinically," she says. "As we study patients with disorders of consciousness, we can probe their levels of awareness in ways that other traditional ways of asking them to respond."

It's no different than any other aspect of the brain that we cannot presently explain, she says:

For example, we don't understand how the brain creates colors. That's a perception that is very private - I don't know that your perception of blue is like my perception of blue, for example. Smells are another one. I don't know that your perception of the smell of an orange is like mine. These are the hard problems of neuroscience and philosophy that we haven't made a great deal of progress on.

What do you think? Is the distinction between "hard problems" and "soft problems" useful, or reductive? Does the brain create consciousness? Will we ever empirically understand where it comes from or how it works?

*This post is part of an ongoing series, [The 21st Century Brain](#).
Image courtesy of [Shutterstock](#).*

<http://bigthink.com/ideas/40965>



Hubble Uncovers Tiny Galaxies Bursting With Starbirth in Early Universe



This image reveals 18 tiny galaxies uncovered by the NASA/ESA Hubble Space Telescope. The puny galaxies, shown in the postage-stamp-sized images, existed 9 billion years ago and are brimming with star birth. The dwarf galaxies are typically a hundred times less massive than the Milky Way galaxy but are churning out stars at such a furious pace that their stellar population would double in just 10 million years. (Credit: This image reveals 18 tiny galaxies uncovered by the NASA/ESA Hubble Space Telescope. The puny galaxies, shown in the postage-stamp-sized images, existed 9 billion years ago and are brimming with star birth. The dwarf galaxies are typically a hundred times less massive than the Milky Way galaxy but are churning out stars at such a furious pace that their stellar population would double in just 10 million years. Hubble's Wide Field Camera 3 and Advanced Camera for Surveys spied the galaxies in a field called the Great Observatories Origins Deep Survey (GOODS). The galaxies' locations in the GOODS field are marked in the large image. The galaxies stood out in the Hubble images because the energy from all the new stars caused the oxygen in the gas surrounding them to light up like a bright fluorescent sign. The rapid star birth likely represents an important phase in the formation of dwarf galaxies, the most common galaxy type in the cosmos. The galaxies are among 69 dwarf galaxies found in the GOODS and other fields. Images of the individual galaxies were taken November 2010 to January 2011. The large image showing the location of the galaxies was taken between September 2002 and December 2004, and between September 2009 and October 2009. Credit: NASA, ESA, A. van der Wel (Max Planck Institute for Astronomy), H. Ferguson and A. Koekemoer (Space Telescope Science Institute), and the CANDELS team)

ScienceDaily (Nov. 10, 2011) — Using its infrared vision to peer nine billion years back in time, the NASA/ESA Hubble Space Telescope has uncovered an extraordinary population of tiny, young galaxies that are brimming with star formation.

The galaxies are churning out stars at such a rate that the number of stars in them would double in just ten million years. For comparison, the Milky Way has taken a thousand times longer to double its stellar population.

These newly discovered dwarf galaxies are around a hundred times smaller than the Milky Way. Their star formation rates are extremely high, even for the young Universe, when most galaxies were forming stars at



higher rates than they are today. They have turned up in the Hubble images because the radiation from young, hot stars has caused the oxygen in the gas surrounding them to light up like a fluorescent sign.

Astronomers believe this rapid starbirth represents an important phase in the formation of dwarf galaxies, the most common galaxy type in the cosmos.

"The galaxies have been there all along, but up until recently astronomers have been able only to survey tiny patches of sky at the sensitivities necessary to detect them," says Arjen van der Wel of the Max Planck Institute for Astronomy in Heidelberg, Germany, lead author of a paper that will appear in a forthcoming issue of the *Astrophysical Journal*. "We weren't looking specifically for these galaxies, but they stood out because of their unusual colours."

The observations were part of the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS), an ambitious three-year survey to analyse the most distant galaxies in the Universe. CANDELS is the first census of dwarf galaxies at such an early epoch on the Universe's history.

"In addition to the images, Hubble has captured spectra from a handful of these galaxies that show us the detailed physics of what's happening within them and confirm their extreme star-forming nature," says co-author Amber Straughn at NASA's Goddard Space Flight Center in Greenbelt, USA.

The observations of ancient galaxies are somewhat at odds with recent detailed studies of the dwarf galaxies that are currently orbiting the Milky Way.

"Those studies suggest that star formation was a relatively slow process, stretching out over billions of years," explains Harry Ferguson of the Space Telescope Science Institute (STScI) in Baltimore, USA, co-leader of the CANDELS survey. "The CANDELS finding that there were galaxies of roughly the same size forming stars at very rapid rates at early times is forcing us to re-examine what we thought we knew about dwarf galaxy evolution."

Team member Anton Koekemoer, also of STScI, who is producing the Hubble imaging for the survey adds: "As our observations continue, we should find many more of these young galaxies and gather more details on their star-forming histories."

The CANDELS team uncovered the 69 young dwarf galaxies in near-infrared images taken with Hubble's Wide Field Camera 3 and Advanced Camera for Surveys. The observations concentrated on two regions of the sky called the Great Observatories Origins Deep Survey-South and the UKIDSS Ultra Deep Survey (part of the UKIRT Infrared Deep Sky Survey).

The observations suggest that the newly discovered galaxies were very common nine billion years ago. But it is a mystery why the newly found dwarf galaxies were making batches of stars at such a high rate. Computer simulations show that star formation in small galaxies may be episodic. Gas cools and collapses to form stars. The stars then reheat the gas through, for example, supernova explosions, which blow the gas away. After some time, the gas cools and collapses again, producing a new burst of star formation, continuing the cycle.

"While these theoretical predictions may provide hints to explain the star formation in these newly discovered galaxies, the observed 'bursts' are much more intense than those reproduced by the simulations," says van der Wel.

The NASA/ESA/CSA James Webb Space Telescope, an infrared observatory scheduled to be launched later this decade, will be able to probe these faint galaxies at an even earlier era to see the glow of the first generation of stars, providing detailed information of the galaxies' chemical composition.





"With Webb, we'll probably see even more of these galaxies, perhaps even pristine galaxies that are experiencing their first episode of star formation," Ferguson says. "Being able to probe down to dwarf galaxies in the early Universe will help us understand the formation of the first stars and galaxies."

Story Source:

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<http://www.sciencedaily.com/releases/2011/11/111110094842.htm>



Why Second Life Failed

How Clay Christensen's "milkshake test" predicts which ultrahyped technology will succeed, and which will bomb.

By [Dan and Chip Heath](#) | Posted Tuesday, Nov. 8, 2011, at 10:05 AM ET



Chip and Dan Heath.

Photograph by Amy Surdacki.

Below is an excerpt from [The Myth of the Garage and Other Minor Surprises](#), a new book by Dan and Chip Heath that launches today. You can get the book free on [Amazon](#) or [B&N](#).

You—sitting right there, reading this article—you're an avatar in [Second Life](#). You work a Second Life job, earning Linden dollars. You have blue hair and a serpentine tail, and you're dating an androgynous digital skateboarder named Rikki. Also, you are a ninja. Life is great.

At least, that's the way things were supposed to unfold. In 2006, the future was Second Life. *Business Week* put Second Life on the cover. American Apparel, Dell, and Reebok, among many others, rushed to build virtual storefronts. Reuters even created a full-time Second Life bureau chief. People rushed to sign up and create their own avatars. Blue hair and Linden dollars were the future.

Advertisement

Looking back, the future didn't last long. By the end of 2007, Second Life was already losing its fizz. "Businesses are shuttering in Second Life, it seems, because no one is using them," wrote Morgan Clendaniel in a [brutal piece in GOOD magazine](#). "There were never any employees at stores like Dell and Reebok when I



visited, nor were there any customers. But that wasn't that shocking because, for the most part, there seems to be no one in Second Life at all."

Today, Second Life limps along. In the first half of 2011, the company reported that an average of about 1 million users logged in every month—which, you have to admit, is about 999,990 more than you expected. But during this same period, Facebook averaged roughly 500 million logins per month.

How did we misread the future so badly? Mind you, this Second Life hype didn't involve distant, sci-fi predictions about the future. ("Someday we'll all commute to the moon using unisex RocketCrocs!") *This was just five years ago.* We were just months away from the iPhone.

After enduring a lifetime of mega-fads that flame out—the Apple Newton and PointCast and the Segway—why are we so quick to extrapolate a few data points into a Dramatic New Future? Well, here's the frustrating part: Sometimes the Dramatic New Future arrives, exactly as promised. The mega-hyped Internet? Yep, worked out OK. Ditto Google and Facebook and iPods and iPhones.

This predictive crapshoot is rough on business leaders—your employees are going to bug you, every time, to greenlight the corporate blog. Or the storefront in Second Life. Or the special on Foursquare. Which efforts are worth it? How can you know, for sure, in advance?

Well, you can't know for sure. You just can't. As Yogi Berra said, "It's tough to make predictions, especially about the future." But in our experience, there's one tool that has proven useful in separating the YouTubes from the Segways. It's adapted from Clay Christensen's *The Innovator's Solution*, and it hinges on, of all things, building a better milkshake.

Second Life Vice Capades: Virtual Hooker (VIDEO)

Christensen asks us to imagine a group of marketers at a fast-food restaurant who want to sell more shakes. As they comb the customer data for insight, they discover something interesting: Most milkshakes are sold to early-morning commuters who buy a single milkshake and nothing else. Why milkshakes?

These commuters, according to Christensen, are "hiring" milkshakes to do a job for them: to supply a breakfast that is filling and nonmessy and cupholder-compatible. So to sell more milkshakes, the marketers don't need to create a more delicious milkshake. Deliciousness isn't really in the job description. Rather, the shakes need to be an ideal commute co-pilot. (If only having a milkshake in the car would let us use the HOV lane ...)

So the restaurant's marketers, inspired, create a self-serve milkshake lane to speed up the morning transaction. They add tiny, straw-suckable chunks of fruit to the shake, which make it last longer and add variety to the dreary commute. These tweaks made the milkshake a more useful "employee," and sales improve. (Note that Christensen tells this milkshake story as a disguised version of an actual project he did, which apparently had nothing to do with milkshakes. But you get the point.)

So when you evaluate the next big thing, ask the Christensen question: What job is it designed to do? Most successful innovations perform a clear duty. When we craved on-the-go access to our music collections, we hired the iPod. When we needed quick and effective searches, we hired Google. And looking ahead, it's easy to see the job that Square will perform: giving people an easy, inexpensive way to collect money in the offline world.

But what "job" did Second Life perform? It was like a job candidate with a fascinating résumé—fluent in Finnish, with stints in spelunking and trapeze—but no actual labor skills. The same was true with the Segway.





No one was interested in employing a \$5,000 walk-accelerator. (Though, to be fair, Segway eventually got a part-time job saving tourists from exercise.)

What about the Apple Newton, the first widely hyped PDA back in the 1990s? It was clearly applying for the right job—to give us mobile access to our calendars and to-do lists and such. But it was a lousy employee, with notoriously poor handwriting recognition and a limited attention span (from low battery life). PalmPilot got the job a few years later.

If the Christensen test alone could predict the future, then the two of us (along with Christensen) would be the richest venture capitalists of all time. It's not a perfect predictor. But by our count, Christensen's test calls correctly about a half-dozen of the big technology hype cycles of the last 20 years. At a minimum, it provides some protection against over-optimism. Think of it as a tinfoil hat to insulate you from the nuttiest predictions.

http://www.slate.com/articles/business/moneybox/2011/11/why_second_life_failed_how_the_milkshake_test_helps_predict_which_ultra_hyped_technology_will_succeed_and_which_won_t.html



No Need to Shrink Guts to Have a Larger Brain



Thanks to communal care for mothers and children, humans can afford both: a huge brain and more frequent offspring. (Credit: Image courtesy of University of Zurich)

ScienceDaily (Nov. 9, 2011) — The so-called expensive-tissue hypothesis, which suggests a trade-off between the size of the brain and the size of the digestive tract, has been challenged by researchers at the University of Zurich. They have shown that brains in mammals have grown over the course of evolution without the digestive organs having to become smaller. The researchers have further demonstrated that the potential to store fat often goes hand in hand with relatively small brains -- except in humans, who owe their increased energy intake and correspondingly large brain to communal child care, better diet and their ability to walk upright.

Brain tissue is a major consumer of energy in the body. If an animal species evolves a larger brain than its ancestors, the increased need for energy can be met by either obtaining additional sources of food or by a trade-off with other functions in the body. In humans, the brain is three times larger and thus requires a lot more energy than that of our closest relatives, the great apes. Until now, the generally accepted theory for this condition was that early humans were able to redirect energy to their brains thanks to a reduced digestive tract. Zurich primatologists, however, have now disproved this theory, demonstrating that mammals with relatively large brains actually tend to have a somewhat bigger digestive tract. Ana Navarrete, the first author on the study recently published in *Nature*, has studied hundreds of carcasses from zoos and museums.

"The data set contains a hundred species, from the stag to the shrew," explains the PhD student. The scientists involved in the study then compared the size of the brain with the fat-free body mass. Senior author Karin Isler stresses that, "it is extremely important to take an animal's adipose deposits into consideration as, in some species, these constitute up to half of the body mass in autumn." But even compared with fat-free body mass, the size of the brain does not correlate negatively with the mass of other organs.

More fat, smaller brain



Nevertheless, the storage of fat plays a key role in brain size evolution. The researchers discovered another rather surprising correlation: the more fat an animal species can store, the smaller its brain. Although adipose tissue itself does not use much energy, fat animals need a lot of energy to carry extra weight, especially when climbing or running. This energy is then lacking for potential brain expansion. "It seems that large adipose deposits often come at the expense of mental flexibility," says Karin Isler. "We humans are an exception, along with whales and seals -- probably because, like swimming, our bipedalism doesn't require much more energy even when we are a bit heavier."

Interplay of energetic factors

The rapid increase in brain size and the associated increase in energy intake began about two million years ago in the genus Homo. Based on their extensive studies of animals, the Zurich researchers propose a scenario in which several energetic factors are involved: "In order to stabilize the brain's energy supply on a higher level, prehistoric man needed an all-year, high-quality source of food, such as underground tubers or meat. As they no longer climbed every day, they perfected the art of walking upright. Even more important, however, is communal child care," says Karin Isler. Because ape mothers do not receive any help, they can only raise an offspring every five to eight years. Thanks to communal care for mothers and children, humans can afford both: a huge brain and more frequent offspring.

Story Source:

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

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<http://www.sciencedaily.com/releases/2011/11/111109131304.htm>



Peter Campbell

Mary-Kay Wilmers

The fox on the cover of this issue is walking past Peter Campbell's house in South London, the house (he wrote about it in the *LRB* in September) where he and his wife had lived since 1963. Peter died – in that house – on 25 October and the picture on the cover is the last one he painted.

Peter was always at the heart of the *LRB*. He designed the first issue in October 1979 – a 28-page insert inside European editions of the *New York Review*; redesigned it six months later after the papers' divorce; and in 1997 re-redesigned it. But saying that gives no sense of his importance to the paper. As much as the original editors and the founder, Karl Miller, Peter shaped the *LRB*. Unlike us, he never lost his temper. More adjusted than most to his own wants and necessities, and so better able to accommodate other people's, he was an exemplary person to work with.

He was born in New Zealand in 1937 (in a taxi in a tunnel: he never told us that) and had two sisters – often a help to a boy. At university in Wellington, he did 'the kind of degree in which you are allowed to mix subjects' and spent his first year reading philosophy, geology and English: 'I never quite got a grip on these subjects,' he said in a review of George Landow's *Hypertext* in 1992, 'but the memory of what it is like to do philosophy or geology remains; and when I read about debates that are going on in these areas I believe I know, even if I cannot follow it all, what kind of row or celebration is taking place.' There are people whom getting a grip doesn't suit, who don't want to be confined. One can honour the world in depth or across a wide range and there were few aspects of the world that Peter didn't wish to honour.

Dandelions: 'Weeds have only a passing hegemony and must expect a modest future role.' Rainbows: 'If the rainbow is something you assumed you understood, humility follows on the unsurprising discovery that things which gave Aristotle ... serious problems are lying about in your own head, like unopened mail waiting to be dealt with.' Bodies and clothes: 'Bodies differ from place to place and race to race, from person to person and from fat times to lean. Clothes battle against these differences. They help bodies to conform to norms of what is decent, impressive, dignified, lovely, erotic or charming.' Cycling: 'Asker Jukendrup, a Dutch expert on carbohydrate and fat metabolism, uses the cheeseburger as a unit to describe calorific intake. Inputs equivalent to 28 cheeseburgers a day fuel the rider during a mountain stage.' Ducks: 'It seemed that the drake was struggling with a long pink worm; I remembered a piece of research that was in the press a year or so ago: not many birds have a penis but the stiftail duck does.' Doors: 'The door to Number 10 domesticates politics because it is commonplace in its look and scale: we know what it is like to stand on such a threshold, we too do things behind closed doors.' Horses: 'Equestrian monuments give short generals dignity. Once mounted, Frederic Remington's scruffy cowboys and Indians become brothers to the riders on the Parthenon frieze.' Port Sunlight: 'I know of no other place where I feel such a snob and where snobbishness feels such a thin emotion.' Finally, a lament: 'We know (roughly) what Maisie knew, but not what Maisie wore.'

He graduated in 1958 with a philosophy degree but a couple of years into his course he'd already become a compositor's apprentice: 'I was an inveterate picker-up and putter-down of books,' he recalled in the review of *Hypertext*, 'because I was interested in how they looked. I got to care more about how they were put together and organised than about their content.' He paid for the month-long sea voyage from Wellington with money he'd earned as a typographer and illustrator, and arrived in London in 1960. He found work at BBC Publications designing schools pamphlets. The ship he'd travelled on, MS *Willem Ruys*, was later renamed *Achille Lauro* – that was another thing he didn't tell us.

Karl Miller and I got to know him a few years later when he'd begun to design the BBC books that accompanied the famous television series of the late 1960s and early 1970s – Kenneth Clark's *Civilisation*, *The Ascent of Man*, *Life on Earth* – and we were working on the *Listener*, which published the scripts. (The *Listener*'s circulation rose by 16,000 with the first Clark lecture and dipped by 16,000 after the last.) BBC



Publications was based in Marylebone High Street and the *Listener* in what is now the Langham Hotel. Peter must have walked over to see Karl about the pictures we might reproduce in the text of Clark's first lecture. He had no great liking for corporate life; he preferred to get around, talk to people, find out what they did and how they did it. He got on well too with the grandee lecturers and pontificators – even the supercilious Clark, who was won over when Peter went to see him in his flat in the Albany and recognised an oil painting by the *Punch* illustrator Charles Keene. He confirmed Clark in his new regard for him when he pointed out – had Clark not known or was he just impressed that a man from New Zealand might know too? – that St Paul's was built on a Gothic plan and went on to describe the figures in a photograph of Roman ruins as 'Piranesi people'.

It wasn't long before Karl asked Peter to write for the paper and in the late 1960s he wrote his first piece, about Claes Oldenburg. Looking for but failing to find that issue in an untidy stack of old *Listeners*, I found three from 1972, fairly late in Karl's reign. Like all Peter's pieces about exhibitions they take you with him into the gallery. The first is about an exhibition of photographs at the Whitechapel ('When a glum, derisive, sulky or tired face looks out at you, remember it is the photographer he is seeing – not you'); the second about a print-making show at Colnaghi's ('Whistler ... produced simpler and simpler etchings until his colleagues in the Etching Club thought that an adjustment should be made to prices to allow for the lack of labour in his plates'); the third about painting in the age of Charles I, an exhibition at the Tate: 'These portraits,' Peter wrote, 'are triumphs of an international style: a reminder that artists could be contracted to courts as film stars once were to their studios – and as jealously guarded.'

Peter didn't like everything he saw, but mostly he avoided writing about work that didn't accord with his taste or his sense of things; if he couldn't find a reason to be interested he wrote about something else – another exhibition or the trees on the street. A comprehensive show of 1930s art was the first exhibition he wrote about in the *LRB*; it was, he felt, misconceived: 'an attempt at total recall' that reduced the works on display 'to the status of evidence'. But once the point had been made there was no further reason to mope:

One could say that the time has come ... honestly to enjoy the shine on the rump of a Munnings horse, the discretion of a Nicholson relief, the fresh-as-paint prettiness of a Susie Cooper teapot, the housewifely amateurishness of an Omega Workshops painted table, the wit of a Shell poster: to chuck exclusive theories overboard. The makers could not; perhaps historians now can. Fifty years should be about the time it takes for the intellectual scaffolding around art to decay, fall away, be dismantled.

He tells you things about painting and how it's done that no one else thinks to tell you – of an Alice Neel nude self-portrait, for example: 'Her face is rather tight around the mouth, as a painter's face can be when reaching a decision about just how a detail seen in the mirror can be put down with the next stroke' – or maybe has noticed: 'It comes to you that when you can see a sitter's feet ... the view is wide enough to let you in.' And why sometimes you don't want to be let in: 'Looking at her work in displays like these at the Tate,' he says of Louise Bourgeois, 'one feels to a degree excluded from what made her own work important to her. At times you are grateful. Some of the objects would like to enter your imagination by a back door that you might think it better to keep shut.'

He has his own ways too of making sense of artists' trajectories, the contexts and constraints of their careers – Bourgeois's or Titian's.

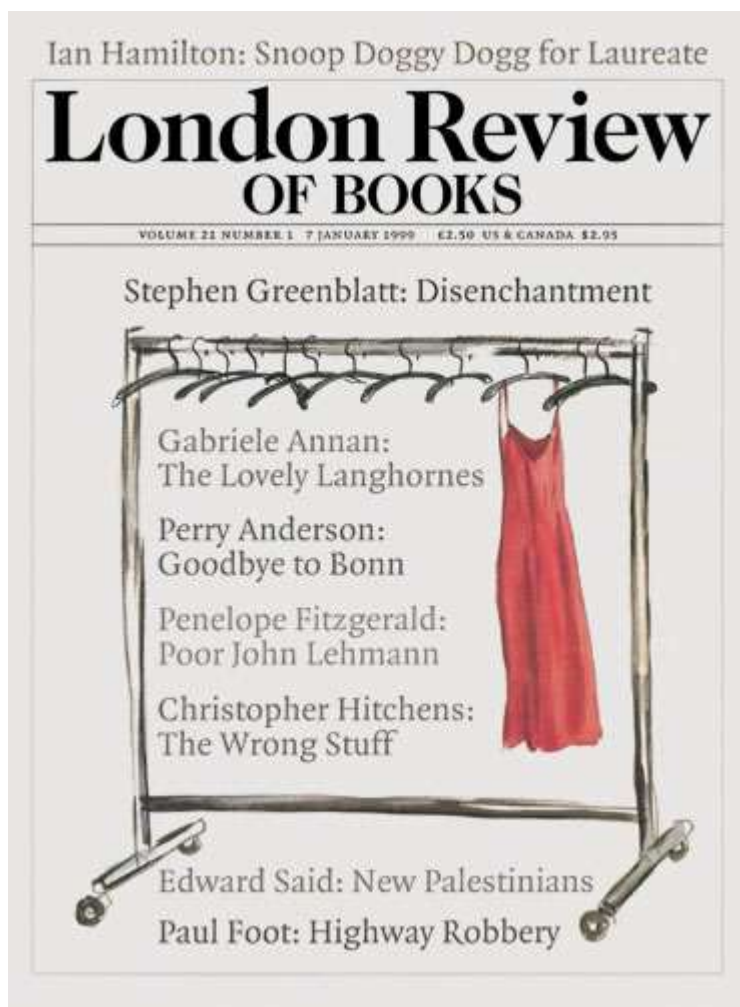
Bourgeois at one time or another met, often knew well, the great artists of her time ... While they pursued single ways of making art – and were told that they stood on the threshold of a future in which modernism would advance with an assurance to match that of the thousand years of art that lay behind them – Bourgeois was playing Martha in the kitchen, cooking up art that seemed to be the work of a not-quite-in-tune follower of a whole string of them, but which now looks much more contrary.

On the one hand, Martha; on the other, the Doge:



It is hard now to imagine the relationship between a painter made independent by great men competing for his services, and a ruler entranced by the artist's ability to give substance to the notion of embodied power – in images, moreover, which are from the same hand as those which show Mary assumed into the vault of heaven and the adventures of mythical heroes. Whatever the reality of these relationships, the fact that the painter had something of great value in his gift makes sense of anecdotes in which king and painter treat each other as equals – the one a real ruler, the other a ruler in the kingdom of representation.

'The finish is smooth, precise and brilliant,' he wrote of Ingres's portraits. 'The brush-strokes are hardly visible and you have to look closely to see how the paint was applied. It is as though these people had been expensively transformed by some cosmetic process into Ingres-flesh.' He was unusual in getting equal pleasure from the world and from its representation; from understanding Ingres-flesh and the anatomy of the stiftail duck. In the same way I imagine that he got equal pleasure from writing about pictures and from looking at them.



It is hard to believe that soon there will be paintings that aren't by Peter on the cover. It's only now when we explain to other people how the covers worked that we realise how spoiled we were. From time to time Peter would come into the office with a batch of watercolours under his arm, three or four in a big folder – 'I've got some covers for you' – and go away before we looked at them. Usually there was one in the batch that Peter knew we wouldn't like: a figure, often a woman, often blonde with an air of the 1950s about her, almost



always half-asleep. Sometimes it wasn't a woman but a man, say, with a flower in his hand, and those too we had trouble with. Peter would bring in the original drawing and a mock-up with words from a previous issue to show where the new words should go. Understandably, he didn't like the words – not the words we had chosen: any words at all – and there was an unstated war between covers (like the present one) that couldn't accommodate words and covers that were all words – as sometimes they had to be. Every other Thursday afternoon we would choose the cover for the next issue. The considerations were simple: season (no beaches in winter, no bare trees in summer); general appropriateness (no ice-cream sundaes in wartime); and how many pieces had to be signalled on the cover. Sometimes a cover would hang around for a year and suddenly find favour. There's one in the drawer now: a yellow coach parked at night beside a dark forest. I find it scary and keep taking it out and putting it back. The only literal connection I remember between a cover and the content was in an issue with the piece by Jenny Diski that eventually became her book *Skating to Antarctica*: Peter did a wonderful painting of the moon in its successive movements, rising and falling over a polar landscape. That may have been a pure coincidence (nobody can remember) and in any case the piece advertised on the rubric – it was the first issue of 1997 – was Alan Bennett's 'What I did in 1996.' One thing Bennett didn't do was skate to Antarctica.

<http://www.lrb.co.uk/v33/n22/mary-kay-wilmers/peter-campbell>



Can Fetus Sense Mother's Psychological State? Study Suggests Yes



Ultrasound image of fetus inside womb. (Credit: © Mikael Damkier / Fotolia)

ScienceDaily (Nov. 10, 2011) — As a fetus grows, it's constantly getting messages from its mother. It's not just hearing her heartbeat and whatever music she might play to her belly; it also gets chemical signals through the placenta. A new study, which will be published in *Psychological Science*, a journal of the Association for Psychological Science, finds that this includes signals about the mother's mental state. If the mother is depressed, that affects how the baby develops after it's born.

In recent decades, researchers have found that the environment a fetus is growing up in -- the mother's womb -- is very important. Some effects are obvious. Smoking and drinking, for example, can be devastating. But others are subtler; studies have found that people who were born during the Dutch famine of 1944, most of whom had starving mothers, were likely to have health problems like obesity and diabetes later.

Curt A. Sandman, Elysia P. Davis, and Laura M. Glynn of the University of California-Irvine study how the mother's psychological state affects a developing fetus. For this study, they recruited pregnant women and checked them for depression before and after they gave birth. They also gave their babies tests after they were born to see how well they were developing.

They found something interesting: what mattered to the babies was if the environment was consistent before and after birth. That is, the babies who did best were those who either had mothers who were healthy both before and after birth, and those whose mothers were depressed before birth and stayed depressed afterward. What slowed the babies' development was changing conditions -- a mother who went from depressed before birth to healthy after or healthy before birth to depressed after. "We must admit, the strength of this finding surprised us," Sandman says.

Now, the cynical interpretation of our results would be that if a mother is depressed before birth, you should leave her that way for the well-being of the infant. "A more reasonable approach would be, to treat women who present with prenatal depression. Sandman says. "We know how to deal with depression." The problem is, women are rarely screened for depression before birth.

In the long term, having a depressed mother could lead to neurological problems and psychiatric disorders, Sandman says. In another study, his team found that older children whose mothers were anxious during pregnancy, which often is co morbid with depression, have differences in certain brain structures. It will take studies lasting decades to figure out exactly what having a depressed mother means to a child's long-term health.



"We believe that the human fetus is an active participant in its own development and is collecting information for life after birth," Sandman says. "It's preparing for life based on messages the mom is providing."

The study is entitled, "Prescient human fetuses thrive."

Story Source:

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<http://www.sciencedaily.com/releases/2011/11/111110142352.htm>



Who said Gaddafi had to go?

Hugh Roberts

So Gaddafi is dead and Nato has fought a war in North Africa for the first time since the FLN defeated France in 1962. The Arab world's one and only State of the Masses, the Socialist People's Libyan Arab Jamahiriyya, has ended badly. In contrast to the bloodless coup of 1 September 1969 that overthrew King Idris and brought Gaddafi and his colleagues to power, the combined rebellion/civil war/ Nato bombing campaign to protect civilians has occasioned several thousand (5000? 10,000? 25,000?) deaths, many thousands of injured and hundreds of thousands of displaced persons, as well as massive damage to infrastructure. What if anything has Libya got in exchange for all the death and destruction that have been visited on it over the past seven and a half months?

The overthrow of Gaddafi & Co was far from being a straightforward revolution against tyranny, but the West's latest military intervention can't be debunked as being simply about oil. Presented by the National Transitional Council (NTC) and cheered on by the Western media as an integral part of the Arab Spring, and thus supposedly of a kind with the upheavals in Tunisia and Egypt, the Libyan drama is rather an addition to the list of Western or Western-backed wars against hostile, 'defiant', insufficiently 'compliant', or 'rogue' regimes: Afghanistan I (v. the Communist regime, 1979-92), Iraq I (1990-91), the Federal Republic of Yugoslavia (over Kosovo, 1999), Afghanistan II (v. the Taliban regime, 2001) and Iraq II (2003), to which we might, with qualifications, add the military interventions in Panama (1989-90), Sierra Leone (2000) and the Ivory Coast (2011). An older series of events we might bear in mind includes the Bay of Pigs (1961), the intervention by Western mercenaries in the Congo (1964), the British-assisted palace coup in Oman in 1970 and – last but not least – three abortive plots, farmed out to David Stirling and sundry other mercenaries under the initially benevolent eye of Western intelligence services, to overthrow the Gaddafi regime between 1971 and 1973 in an episode known as the Hilton Assignment.

At the same time, the story of Libya in 2011 gives rise to several different debates. The first of these, over the pros and cons of the military intervention, has tended to eclipse the others. But numerous states in Africa and Asia and no doubt Latin America as well (Cuba and Venezuela spring to mind) may wish to consider why the Jamahiriyya, despite mending its fences with Washington and London in 2003-4 and dealing reasonably with Paris and Rome, should have proved so vulnerable to their sudden hostility. And the Libyan war should also prompt us to examine what the actions of the Western powers in relation to Africa and Asia, and the Arab world in particular, are doing to democratic principles and the idea of the rule of law.

The Afghans who rebelled against the Communist regimes of Noor Mohammed Taraki, Hafizullah Amin and the Soviet-backed Babrak Karmal, and in 1992 overthrew Mohammed Najibullah before laying waste to Kabul in protracted factional warfare, called themselves *mujahedin*, 'fighters for the faith'. They were conducting a jihad against godless Marxists and saw no need to be coy about it in view of the enthusiastic media coverage as well as logistical support the West was giving them. But the Libyans who took up arms against Gaddafi's Jamahiriyya have sedulously avoided this label, at least when near Western microphones. Religion had little to do with the upheavals in Tunisia and Egypt: Islamists were almost entirely absent from the stage in Tunisia until the fall of Ben Ali; in Egypt the Muslim Brothers weren't instigators of the protest movement (in which Coptic Christians also took part) and made sure their support remained discreet. And so the irrelevance of Islamism to the popular revolt against despotic regimes was part of the way the Arab Spring came to be read in the West. Libyan rebels and Gaddafi loyalists alike tacitly recognised this fact.

The Western media generally endorsed the rebels' description of themselves as forward-looking liberal democrats, and dismissed Gaddafi's exaggerated claim that al-Qaida was behind the revolt. But it has become impossible to ignore the fact that the rebellion has mobilised Islamists and acquired an Islamicist tinge. On his first visit to Tripoli, Mustafa Abdul Jalil, the chairman of the NTC, then still based in Benghazi, declared that all legislation of the future Libyan state would be grounded in the Sharia, pre-empting any elected body on



this cardinal point. And Abdul Hakim Belhadj (alias Abu Abdallah al-Sadiq), whom the NTC appointed to the newly created post of military commander of Tripoli, is a former leader of the Libyan Islamic Fighting Group, a movement which conducted a campaign of terrorism against the Libyan state in the 1990s and went on to provide recruits to al-Qaida. The democratic revolutionaries in Tunisia are now concerned that the re-emergence of the Islamist movement has diverted political debate from constitutional questions to toxic identity issues and may derail the country's nascent democracy; in this light, the Islamist aspect of the Libyan rebellion should put us on our guard. It is among several reasons to ask whether what we have been witnessing is a revolution or a counter-revolution.

The rebels' name has changed several times in the Western media's lexicon: first they were peaceful demonstrators, democracy protesters, civilians; then (a belated admission) rebels; and, finally, revolutionaries. Revolutionaries – in Arabic, *thawwar* (singular: *tha'ir*) – has been their preferred label at least since the fall of Tripoli. *Tha'ir* can simply mean 'agitated' or 'excited'. The young men who spent much of the period between April and July careering up and down the coastal highway in Toyota pick-ups (and the whole of September running backwards and forwards around Bani Walid), while firing as much of their ammunition into the air as at the enemy, have certainly been excited. But how many veterans of revolutions elsewhere, as distinct from Western journalists, would recognise them as their counterparts?

The events in both Tunisia and Egypt have been revolutionary in intent, but the change that has occurred in Egypt falls well short of a genuine revolution: the army's return to power means that the country's politics has yet to transcend the logic of the Free Officers' state established in 1952. But the way hundreds of thousands stood up against Mubarak last winter was a historic event Egyptians will never forget. The same is true of Tunisia, except that there a revolution has not only toppled Ben Ali but also ended the monopoly of the old ruling party. The Tunisians have entered the unknown. Whether they have the resources to cope with the Islamist movement may be their greatest test. The recent elections suggest they are coping pretty well.

Libya was part of the wider 'Arab awakening' in two respects. The unrest began on 15 February, three days after the fall of Mubarak: so there was a contagion effect. And clearly many of the Libyans who took to the streets over the next few days were animated by some of the same sentiments as their counterparts elsewhere. But the Libyan uprising diverged from the Tunisian and Egyptian templates in two ways: the rapidity with which it took on a violent aspect – the destruction of state buildings and xenophobic attacks on Egyptians, Serbs, Koreans and, above all, black Africans; and the extent to which, brandishing the old Libyan flag of the 1951-69 era, the protesters identified their cause with the monarchy Gaddafi & Co overthrew. This divergence owed a lot to external influences. But it also owed much to the character of Gaddafi's state and regime.

Widely ridiculed as the bizarre creation of its eccentric if not lunatic 'Guide', the Socialist People's Libyan Arab Jamahiriyya in fact shared many features with other Arab states. With the massive increase in oil revenues in the early 1970s, Libya became a 'hydrocarbon society' that resembled the states of the Gulf more than its North African neighbours. Libya's oil revenues were distributed very widely, the new regime laying on a welfare state from which virtually all Libyans benefited, while also relying on oil wealth, as the Gulf States do, to buy in whatever it lacked in terms of technology and consumer goods, not to mention hundreds of thousands of foreign workers. For Gaddafi and his colleagues the state's distributive role quickly became the central element in their strategy for governing the country.

The 1969 coup belonged to the series of upheavals that challenged the arrangements made by Britain and France to dominate the Arab world after the First World War and the destruction of the Ottoman Empire. These took on a new vigour in the wake of the defeats of the Second World War and the supersession of British by American hegemony in the Middle East. These arrangements entailed the sponsoring, safeguarding and manipulation of newly confected monarchies in Saudi Arabia, Jordan, Iraq, Egypt, Libya and the Gulf statelets, and in most cases the challenges were precipitated by catastrophic developments in the Arab-Israeli conflict. Just as the Free Officers who deposed King Farouq and seized power in Egypt in 1952 were outraged at the incompetent way Egypt's armed forces were led in 1948, and the revolution in Iraq in 1958 owed much





to increased hostility to the pro-British monarchy after Suez, so the Arab defeat in 1967, and crucially, frustration at Libya's absence from the Arab struggle, prompted Gaddafi and his colleagues to attempt their coup against the Libyan monarchy. However, beyond closing the US base at Wheelus Field and nationalising the oil, they didn't really know what to do next.

Unlike his Hashemite counterparts, who came from Mecca and were foreigners in Jordan and Iraq, King Idris was at least a Libyan. He also had legitimacy as the head of the Sanussiyya religious order, which in the course of the 19th and early 20th centuries had established itself the length and breadth of eastern Libya, and had distinguished itself in the resistance to the Italian conquest from 1911 onwards. But like the Hashemites Idris came to the throne as a protégé of the British, who fished him out of Cairo, where he had spent more than 20 years in exile, to make him king and thereby recast Libya as a monarchy in 1951 when the UN finally decided what to do with the former Italian colony.

The Sanussiyya, originally an Islamic revivalist order, was set up in north-eastern Libya, the province the Italians called Cyrenaica, by an immigrant divine from western Algeria, Sayyid Mohammed ben Ali al-Sanussi al-Idrisi, who founded his order in Mecca in 1837 but moved it to Libya in 1843. It took root throughout the eastern province in the interstices of Bedouin tribal society and spread south along the trade routes that crossed the Sahara into Sudan, Chad and Niger. It had less of a presence in western Libya: in Tripolitania in the north-west, which had its own religious and political traditions based on the Ottoman connection, and Fezzan in the south-west. The two western provinces have always been considered part of the Maghreb (the Arab west), linked primarily to Tunisia and Algeria, while eastern Libya has always been part of the Mashreq (the Arab east) and oriented to Egypt and the rest of the Arab Levant.

The new monarchy's internal social basis was thus markedly uneven and Idris was badly placed to promote a genuine process of national integration, opting instead for a federal constitution that left Libyan society much as he found it while, out of deference to his Western sponsors as well as alarm at the rise of radical Arab nationalism and Nasserism in particular, he insulated the country from the rest of the Arab world. Gaddafi's coup was a revolt against this state of affairs, and the otherwise baffling flamboyance of his foreign policy was evidence of his determination that Libya should no longer be a backwater.

The new regime's inner circle was drawn from a small number of tribes, above all the Gadadfa in central Libya, the Magarha from the Fezzan in the south-west and the Warfalla from south-eastern Tripolitania. This background did not dispose Gaddafi and his associates to identify with the political and cultural traditions of the Tripoli elites or those of Benghazi and the other towns of coastal Cyrenaica. As the elites saw it, the 1969 coup had been carried out by 'Bedouin' – that is, country bumpkins. For Gaddafi & Co, the traditions of the urban elites offered no recipe for governing Libya: they would only perpetuate its disunity.

The Mediterranean and the Middle East are not short of examples of lands made painfully into states based, not on the cosmopolitan societies of the seaboard, but on the bleak and hard regions of the interior. It was the austere society and sombre towns of the Castilian plateau, not sophisticated Barcelona or sunny Valencia or Granada, that brought forth the kingdom which, once joined to Aragon, united the rest of Spain at the expense of the rich culture of Andalucia in particular. In the same way Ibn Saud, ruler of the unforgiving Nejd plateau in the centre of the Arabian peninsula, had united the Arabs under the sword while forcing the townsmen of the Hijaz, near the Red Sea coast, who were nourished on the traditions of all four *madhahib* (legal schools) of Sunni Islam and well acquainted with the various Shia traditions, to bend the knee to Wahhabi dogmatism. Ibn Saud had the militant religious tradition of the *muwahiddun*, the disciples of the Nejd religious reformer Muhammad Ibn Abd al-Wahhab, behind him in his drive to unify Arabia by conquest. Even the revolutionaries of the FLN had religion going for them, not only because they were confronting a Christian colonial power but also as heirs to the al-Islah reform movement. But Gaddafi and his associates had no militant religious banner and organised Islam in Libya was minded to resist them.



Pre-empted in the religious sphere by both the Sanussiyya in the east and the pan-Islamic tradition of the Tripolitanian *'ulama*, which dated from the Ottoman era, they were desperate to find a doctrinal source for the kind of ideological enthusiasm they needed to stir in order to reorder Libyan society. At the outset, they thought they had one in pan-Arabism, which, especially in its Nasserite version, had inspired enthusiasm across North Africa from 1952 onwards, putting the champions of Islam on the back foot. But Gaddafi & Co were latecomers to the Arab nationalist revolutionary ball and little more than a year after their seizure of power Nasser was dead. For some time Gaddafi persisted with the idea of a strategic relationship with Egypt, which would have helped to solve several of the new Libya's problems, providing it with an ally and shoring up the regime's efforts to deal with refractory currents in Cyrenaica. But Egypt under Sadat veered away from pan-Arabism and plans for an Egyptian-Libyan union, announced in August 1972, led nowhere. In late 1973 an anti-Egyptian campaign was launched in the Libyan press, and Libya's embassy in Cairo was closed.

Gaddafi now tried to contract an alliance with his western neighbour, declaring a new 'Arab-Islamic Republic' with Tunisia's Habib Bourguiba in January 1974. This too proved stillborn. Many wondered what on earth the worldly, Francophile, secular and moderate Bourguiba could have been thinking and Houari Boumediène, Algeria's president, weighed in to remind Tunis that there could be no shift in the geopolitical balance of the Maghreb without Algeria's agreement. Following this logic, Gaddafi secured an alliance with Algeria, and in 1975 Boumediène and Gaddafi signed a treaty of mutual friendship. It appeared that Libya had at last entered an alliance it could rely on. Two years later, after Sadat's visit to Tel Aviv, Libya joined Algeria, Syria, South Yemen and the PLO in the Steadfastness Front, which was opposed to any rapprochement with Israel. But Boumediène died unexpectedly in late 1978. His successor, Chadli Bendjedid, emulating Sadat, abandoned Algeria's revolutionary commitments and the protective alliance with Tripoli; Libya was alone again. Gaddafi's desperation is evident in the short-lived treaty he signed with Morocco's King Hassan in 1984. It was his last attempt to fit in with fellow North African and Arab states. Instead, he looked to sub-Saharan Africa, where the Jamahiriyya could play the benevolent patron.

All the states of North Africa have had African policies of a kind. And all but Tunisia have strategic hinterlands consisting of the countries to their south: for Egypt, the Sudan; for Algeria, the Sahel states (Niger, Mali and Mauritania); for Morocco, Mauritania, also a permanent bone of contention with Algeria. In pursuing their African policies, the North African states often compete with one another, but they have also been in competition with Western powers keen to preserve or, in the case of the US, to contract patron-client relations with these states. What distinguished Gaddafi's Libya from its North African neighbours was the extent of its investment in this southern strategy, which became central to the regime's conception of Libya's mission in the world.

The Jamahiriyya's African policy had a darker side. Gaddafi's support for Idi Amin is the outstanding example, though even that seems less grotesque when weighed against the support of various Western governments for Mobutu Sese Seko. There was also Libya's involvement in Chad's civil war (and attempted annexation of the Aouzou Strip) and its sustained involvement in the Tuareg question in Niger and Mali. At the same time, it gave strong financial and practical support to the African Union, opposed the installation of the US military's 'Africom' on the soil of any African country and funded a wide range of development projects in sub-Saharan countries. Gaddafi planned to exploit the immense water reserves under Libya's Sahara, and to provide water to the Sahel countries, which could have transformed their economic prospects, but this possibility has now almost certainly been killed off by Nato's intervention, since Western (and perhaps particularly French) water companies are lining up alongside Western oil firms for their slice of the Libyan action.

Gaddafi's African policy gave Libya a firm geopolitical position and consolidated its strategic hinterland while also benefiting Africa. That many African countries appreciated Libya's contribution to the continent's affairs was made clear by the AU's opposition to Nato's intervention and its sustained efforts to broker a ceasefire and negotiations between the two sides of the civil war. These efforts were dismissed with scorn by Western governments and press, with African opposition to the military intervention cynically derided as



Libya's clients doing their duty to their patron, a self-serving judgment that was unfair to South Africa in particular. That the Arab League, whose support for a no-fly zone was invoked by London, Paris and Washington to claim Arab legitimation of Nato's intervention, had a membership almost entirely confined to Western powers' client states was never mentioned.

The situation was full of irony for Libya. Gaddafi's son Saif al-Islam's contemptuous comment on the Arab League's resolution, 'El-Arab? Toz fi el-Arab!' ('The Arabs? To hell with the Arabs!'), expressed the family's bitter recognition that the pan-Arabism behind the 1969 revolution had long ago become obsolete as the majority of Arab states subsided into shamefaced submission to the Western powers. The problem for Gaddafi & Co was that the African perspective they had diligently pursued as a *solution de rechange* for defunct pan-Arabism consistent with their original anti-imperialist worldview meant little to the many Libyans who wanted Libya to approximate to Dubai, or, worse, stirred virulent resentment against the regime and black Africans alike. And so, in taking Libya into Africa while tending to remove it from Arab regional affairs, the Jamahiriyya's foreign policy, like that of Idris's monarchy, cut the Libyans off from other Arabs, especially the well-heeled Gulf Arabs whose lifestyle many middle-class Libyans aspired to. In this way, the regime's foreign policy made it vulnerable to a revolt inspired by events elsewhere in the Arab world. But there was another reason for its vulnerability.

The authors of the 1969 coup initially took Nasser's Egypt for their model, imitating its institutions and terminology – Free Officers, Revolutionary Command Council – and equipping themselves with a single 'party', the Arab Socialist Union (ASU), like Nasser's prototype essentially a state apparatus providing a façade for the new regime. But within two years, Sadat's de-Nasserisation purges were underway and he was mending fences with the Muslim Brothers, while the beginning of *infatih* – his policy of opening up the economy – announced the retreat from 'Arab socialism' and the rift with Moscow presaged the turn to America. Thus the Egyptian model evolved rapidly into an anti-model, while the experiment with the ASU proved an instructive failure. The idea of a single party seemed to make sense in Libya as it had originally made sense in Egypt and also Algeria. Leaders of military regimes needed to set up a civilian façade so that they could offer a degree of controlled representation and bring the politically ambitious into the new dispensation. But in Egypt and Algeria the architects of the new single party were dealing with comparatively politicised populations. Gaddafi & Co confronted a politically inert society, with little in the way of a state tradition, pulverised by a brutal colonial conquest and reduced to onlookers as the country became a battleground in World War Two, then liberated from colonial rule by external forces and finally tranquillised by the Sanussi monarchy. In trying to launch the ASU, the new regime found little to work with in terms of political talent or energy in the wider population; instead it was the old elites of Tripoli and Benghazi who invested in the party, which not only failed to mobilise popular enthusiasm but became a focus of resistance to the revolution Gaddafi had in mind.

Gaddafi accordingly began to develop an idea he voiced within weeks of seizing power in 1969: that representative democracy was unsuited to Libya. Other leaders in North Africa and the Middle East felt the same about their own countries. But in pretending to allow for representation they were acknowledging their vice in tacitly paying homage to virtue. In his *Green Book*, however, Gaddafi scandalised people by his refusal to be a hypocrite: he elevated his rejection of representation into an explicit constitutive principle which he called the State of the Masses. But the real problem was that his new course led Libya to a historic impasse.

He dispensed with the ASU and the idea of a single ruling party, promoting instead People's Congresses and Revolutionary Committees as the key political institutions of the Jamahiriyya, which was proclaimed in 1977. The former were to assume responsibility for public administration and secure popular participation, the latter to keep the flame of the Revolution alive. The members of the People's Congresses were elected, and these elections were taken seriously, at least at the local level and for a while. But voters were not, in theory, electing representatives, merely deciding who among the candidates on offer they wished to assume the mainly administrative responsibilities of the bodies in question. The system encouraged political and





ideological unanimity, allowing no voice for dissident opinion except on trivial matters. It drew many ordinary Libyans into a sort of participation in public affairs, although this was waning by the mid-1990s, but it did not educate them in other aspects of politics, and did not work well on its own terms either.

Gaddafi's State of the Masses drew on ideas developed elsewhere. The championing of direct over representative democracy was a prominent feature of the utopian outlook of young Western leftists in the 1960s. And the strategic decision to mobilise the 'revolutionary' energies of the young to outflank conservative party apparatuses was central to Mao's Cultural Revolution and a feature of Boumediène's 'Révolution socialiste'. Where Gaddafi went further was in abolishing the ASU and outlawing parties altogether, but in this he could claim a doctrinal warrant: the notion that there should be no political parties in a Muslim country has long been advocated by some currents of Sunni Islamism, on the grounds that 'party' connotes *fitna*, or a division of the community of the faithful, the supreme danger. Kuwait, Oman, Saudi Arabia and the United Arab Emirates allow no political parties to this day. (Gaddafi's rule always had a more pronounced Islamic aspect than that of the regimes in Cairo and Algiers; his intolerance of Islamists owed a lot to the fact that he was intent on remaining the source of radicalism and unwilling to allow rivals.) Finally, the idea of direct popular participation in public administration could claim a local origin in the tradition of the Bedouin tribes known as *hukumat 'arabiyya* (meaning here 'people's government' not 'Arab government'), in which every adult male can have his say.

The Jamahiriyya lasted 34 years (42 if backdated to 1969), a respectable innings. It did not work for foreign businessmen, diplomats and journalists, who found it more exasperating to deal with than the run of Arab and African states, and their views shaped the country's image abroad. But the regime was not designed to work for foreigners and seems to have worked fairly well for many Libyans much of the time. It achieved more than a tripling of the total population (6.5 million today, up from 1.8 million in 1968), high standards of healthcare, high rates of schooling for girls as well as boys, a literacy rate of 88 per cent, a degree of social and occupational promotion for women that women in many other Arab countries might well envy and an annual per capita income of \$12,000, the highest in Africa. But the point about these indices, routinely cited, naturally enough, by critics of the West's intervention in reply to the propaganda that has relentlessly blackened the Gaddafi regime, is that they are in one crucial sense beside the point.

The socio-economic achievements of the regime can be attributed essentially to the distributive state: that is, the success of the hydrocarbons sector and of the mechanisms put in place early on to distribute petrodollars. But the central institutions of the Jamahiriyya, the tandem of People's Congresses and Revolutionary Committees, did not make for effective government at all, in part because they involved a tension between two distinct notions and sources of legitimacy. The Congresses embodied the idea of the people as the source of legitimacy and the agent of legitimation. But the Committees embodied the very different idea of the Revolution as possessing a legitimacy that trumped all others. At the apex of the Revolution was Gaddafi himself, which is why it made sense for him to position himself outside the structure of Congresses and hence of the formal institutions of government, neither prime minister nor president but simply Murshid, Guide, Brother Leader. The position enabled him to mediate in free-wheeling fashion between the various components of the system and broader public opinion, criticising the government (and thereby articulating public restiveness) or deploring the ineffectiveness and correcting the mistakes of People's Congresses and doing so always from the standpoint of the Revolution. The tradition of an Arab ruler making a virtue of siding with public opinion against his own ministers goes back to Haroun al-Rashid. But the way revolutionary legitimacy could override popular legitimacy in Gaddafi's system also resembles Khomeini's insistence that the interests of Iran's revolution could override the precepts of the Sharia – i.e. that political considerations could trump Islamic dogma – and that he was the arbiter of when this was necessary. It is striking that Gaddafi considered that the interest of the Revolution required the hydrocarbons sector to be spared the ministrations of People's Congresses and Revolutionary Committees alike.

Words such as 'authoritarianism', 'tyranny' (a favourite bugbear of the British) and 'dictatorship' have never really captured the particular character of this set-up but have instead relentlessly caricatured it. Gaddafi,





unlike any other head of state, stood at the apex not of the pyramid of governing institutions but of the informal sector of the polity, which enjoyed a degree of hegemony over the formal sector that has no modern counterpart. It meant that the Jamahiriyya's formal institutions were extremely weak, and that included the army, which Gaddafi mistrusted and marginalised.

One is tempted to say of Gaddafi, 'L'état, c'était lui.' But it was the more and more mystical idea of the Revolution, not heredity and divine right, that legitimated his power. And the intangible content of this Revolution, what Ruth First called its elusiveness, was closely connected to the fact that the Revolution was never over.

A distinction between revolutionary and constitutional government was made in 1793 by Robespierre, when he wrote: 'The aim of constitutional government is to preserve the Republic; that of revolutionary government is to lay its foundation.' The effective historical function of the revolutionary government in Libya was to ensure that, while the country was modernised in important respects, it did not and could not become a republic. The Libyan Revolution turned out to be permanent because its objects were imprecise, its architects had no form of law-bound, constitutional government in view as a final destination and no conception of a political role for themselves or anyone else after the Revolution. The State of the Masses, *al-jamahiriyya*, was presented as far superior to a mere republic – *jumhuriyya* – but in fact fell far short of one. And, in contrast to states that call themselves republics but fail to live up to the name, its pretensions signalled that there was never an intention to establish a real republic in which government would truly be the affair of the people. The State of the Masses was in reality little more than a game to occupy and contain ordinary Libyans while the grown-up business of politics was conducted behind the scenes, the affair of a mysterious and unaccountable elite.

The mobilisation of society in the French Revolution threw up several independent-minded leaders – Danton, Marat, Hébert et al as well as Robespierre – which made it psychologically possible for fellow Jacobins to rebel against Robespierre and set in train the tortuous process of superseding revolutionary by constitutional government. Something similar, up to a point, can be said of Algeria (where the independence struggle threw up a superabundance of strong-minded revolutionaries), although 49 years on, the winding road to the democratic republic still stretches far ahead, as it did in France. But the political inertia of Libyan society meant that its Revolution had one and only one leader. Gaddafi's closest colleagues no doubt had personal influence but only one of them, Abdessalam Jalloud, had it in him to disagree openly with Gaddafi on major issues (and he finally quit on his own terms in 1995). And so Gaddafi's rule can be seen as an extreme instance of what Rosa Luxemburg called 'substitutionism': the informal government that was the real government of Libya was a one-man show. Incarnating the nebulous Revolution, the imprecise interest of the nation and the inarticulate will of the people at the same time, Gaddafi clearly believed he needed to make the show interesting. His flamboyance had a political purpose. But how long can colourfulness command consent, let alone loyalty? A Pied Piper leading Libyans – mostly well fed, housed and schooled, but maintained in perpetual political infancy – to no destination in particular. The wonder of it is that the show had such a long run.

Gaddafi seems to have realised years ago what he had done – the quasi-utopian dead end he had got Libya and himself into – and tried to escape its implications. As early as 1987 he was experimenting with liberalisation: allowing private trading, reining in the Revolutionary Committees and reducing their powers, allowing Libyans to travel to neighbouring countries, returning confiscated passports, releasing hundreds of political prisoners, inviting exiles to return with assurances that they would not be persecuted, and even meeting opposition leaders to explore the possibility of reconciliation while acknowledging that serious abuses had occurred and that Libya lacked the rule of law. These reforms implied a shift towards constitutional government, the most notable elements being Gaddafi's proposals for the codification of citizens' rights and punishable crimes, which were meant to put an end to arbitrary arrests. This line of development was cut short by the imposition of international sanctions in 1992 in the wake of the Lockerbie bombing: a national emergency that reinforced the regime's conservative wing and ruled out risky reform for





more than a decade. It was only in 2003-4, after Tripoli had paid a massive sum in compensation to the bereaved families in 2002 (having already surrendered Abdelbaset Ali al-Megrahi and Al Amin Khalifa Fhima for trial in 1999), that sanctions were lifted, at which point a new reforming current headed by Gaddafi's son Saif al-Islam emerged within the regime.

It was the fashion some years ago in circles close to the Blair government – in the media, principally, and among academics – to talk up Saif al-Islam's commitment to reform and it is the fashion now to heap opprobrium on him as his awful father's son. Neither judgment is accurate, both are self-serving. Saif al-Islam had begun to play a significant and constructive role in Libyan affairs of state, persuading the Libyan Islamic Fighting Group to end its terrorist campaign in return for the release of LIFG prisoners in 2008, promoting a range of practical reforms and broaching the idea that the regime should formally recognise the country's Berbers. While it was always unrealistic to suppose that he could have remade Libya into a liberal democracy had he succeeded his father, he certainly recognised the problems of the Jamahiriyya and the need for substantial reform. The prospect of a reformist path under Saif was ruled out by this spring's events. Is there a parallel with the way international sanctions in the wake of Lockerbie put paid to the earlier reform initiative?

Since February, it has been relentlessly asserted that the Libyan government was responsible both for the bombing of a Berlin disco on 5 April 1986 and the Lockerbie bombing on 21 December 1988. News of Gaddafi's violent end was greeted with satisfaction by the families of the American victims of Lockerbie, understandably full of bitterness towards the man they have been assured by the US government and the press ordered the bombing of Pan Am 103. But many informed observers have long wondered about these two stories, especially Lockerbie. Jim Swire, the spokesman of UK Families Flight 103, whose daughter was killed in the bombing, has repeatedly expressed dissatisfaction with the official version. Hans Köchler, an Austrian jurist appointed by the UN as an independent observer at the trial, expressed concern about the way it was conducted (notably about the role of two US Justice Department officials who sat next to the Scottish prosecuting counsel throughout and appeared to be giving them instructions). Köchler described al-Megrahi's conviction as 'a spectacular miscarriage of justice'. Swire, who also sat through the trial, subsequently launched the Justice for Megrahi campaign. In a resumé of Gaddafi's career shown on BBC World Service Television on the night of 20 October, John Simpson stopped well short of endorsing either charge, noting of the Berlin bombing that 'it may or may not have been Colonel Gaddafi's work,' an honest formula that acknowledged the room for doubt. Of Lockerbie he remarked cautiously that Libya subsequently 'got the full blame', a statement that is quite true.

It is often claimed by British and American government personnel and the Western press that Libya admitted responsibility for Lockerbie in 2003-4. This is untrue. As part of the deal with Washington and London, which included Libya paying \$2.7 billion to the 270 victims' families, the Libyan government in a letter to the president of the UN Security Council stated that Libya 'has facilitated the bringing to justice of the two suspects charged with the bombing of Pan Am 103, and accepts responsibility for the actions of its officials'. That this formula was agreed in negotiations between the Libyan and British (if not also American) governments was made clear when it was echoed word for word by Jack Straw in the House of Commons. The formula allowed the government to give the public the impression that Libya was indeed guilty, while also allowing Tripoli to say that it had admitted nothing of the kind. The statement does not even mention al-Megrahi by name, much less acknowledge his guilt or that of the Libyan government, and any self-respecting government would sign up to the general principle that it is responsible for the actions of its officials. Tripoli's position was spelled out by the prime minister, Shukri Ghanem, on 24 February 2004 on the *Today* programme: he made it clear that the payment of compensation did not imply an admission of guilt and explained that the Libyan government had 'bought peace'.

The standards of proof underpinning Western judgments of Gaddafi's Libya have not been high. The doubt over the Lockerbie trial verdict has encouraged rival theories about who really ordered the bombing, which have predictably been dubbed 'conspiracy theories'. But the prosecution case in the Lockerbie trial was itself a conspiracy theory. And the meagre evidence adduced would have warranted acquittal on grounds of





reasonable doubt, or, at most, the ‘not proven’ verdict that Scottish law allows for, rather than the unequivocally ‘guilty’ verdict brought in, oddly, on one defendant but not the other. I do not claim to know the truth of the Lockerbie affair, but the British are slow to forgive the authors of atrocities committed against them and their friends. So I find it hard to believe that a British government would have fallen over itself as it did in 2003-5 to welcome Libya back into the fold had it really held Gaddafi responsible. And in view of the number of Scottish victims of the bombing, it is equally hard to believe that SNP politicians would have countenanced al-Megrahi’s release if they believed the guilty verdict had been sound. The hypothesis that Libya and Gaddafi and al-Megrahi were framed is to be taken very seriously indeed. And if it were the case, it would follow that the greatly diminished prospect of reform from 1989 onwards as the regime batted down the hatches to weather international sanctions, the material suffering of the Libyan people during this period, and the aggravation of internal conflict (notably the Islamist terrorist campaign waged by the LIFG between 1995 and 1998) can all in some measure be laid at the West’s door.

Wherever the blame lies, the Jamahiriyya survived up to 2011 fundamentally unchanged in its key political features: the absence of political parties, the absence of independent associations, newspapers and publishing houses and the corresponding weakness of civil society, the dysfunctional character of the formal institutions of government, the weakness of the armed forces and the indispensability of Gaddafi himself as the originator of the Revolution that constituted the state. After 42 years of Gaddafi’s rule, the people of Libya were, politically speaking, not much further forward than they were on 31 August 1969. And so the Jamahiriyya was vulnerable to internal challenge the moment Arab mass movements making an issue of human dignity and citizens’ rights got going. The tragic irony is that the features of the Jamahiriyya that made it vulnerable to the Arab Spring also, in their combination, completely ruled out any emulation of the Tunisian and Egyptian scenarios. The factors that enabled a fundamentally positive evolution to occur in both these countries once the mass protest movement started were absent from Libya. In both Tunisia and Egypt, the population’s greater experience of political action gave the protests a degree of sophistication, coherence and organisational flair. The fact that neither president had been a founding figure allowed for a distinction to be made between a protest against the president and his cronies and a rebellion against the state: the patriotism of the protesters was never put in question. And in both cases the role of the armed forces was crucial: being loyal to the state and the nation rather than to a particular leader, they were disposed to act as arbiters and facilitate a resolution without the existence of the state being put in jeopardy.

None of this applied to Libya. Gaddafi was the founder of the Jamahiriyya and the guarantor of its continued existence. The armed forces were incapable of playing an independent political role. The absence of any tradition of non-violent opposition and independent organisation ensured that the revolt at the popular level was a raw affair, incapable of formulating any demands that the regime might be able to negotiate. On the contrary, the revolt was a challenge to Gaddafi and to the Jamahiriyya as a whole (and thus to what existed in the way of a state).

The situation that developed over the weekend following the initial unrest on 15 February suggested three possible scenarios: a rapid collapse of the regime as the popular uprising spread; the crushing of the revolt as the regime got its act together; or – in the absence of an early resolution – the onset of civil war. Had the revolt been crushed straightaway, the implications for the Arab Spring would have been serious, but not necessarily more damaging than events in Bahrain, Yemen or Syria; Arab public opinion, long used to the idea that Libya was a place apart, was insulated against the exemplary effect of events there. Had the revolt rapidly brought about the collapse of the regime, Libya might have tumbled into anarchy. An oil-rich Somalistan on the Mediterranean would have had destabilising repercussions for all its neighbours and prejudiced the prospects for democratic development in Tunisia in particular. A long civil war, while costly in terms of human life, might have given the rebellion time to cohere as a rival centre of state formation and thus prepared it for the task of establishing a functional Libyan state in the event of victory. And, even if defeated, such a rebellion would have undermined the premises of the Jamahiriyya and ensured its demise. None of these scenarios took place. A military intervention by the Western powers under the cloak of Nato and the authority of the United Nations happened instead.





How should we evaluate this fourth scenario in terms of the democratic principles that have been invoked to justify the military intervention? There is no doubt that many Libyans consider Nato their saviour and that some of them genuinely aspire to a democratic future for their country. Even so I felt great alarm when intervention started to be suggested and remain opposed to it even now despite its apparent triumph, because I considered that the balance of democratic argument favoured an entirely different course of action.

The claim that the ‘international community’ had no choice but to intervene militarily and that the alternative was to do nothing is false. An active, practical, non-violent alternative was proposed, and deliberately rejected. The argument for a no-fly zone and then for a military intervention employing ‘all necessary measures’ was that only this could stop the regime’s repression and protect civilians. Yet many argued that the way to protect civilians was not to intensify the conflict by intervening on one side or the other, but to end it by securing a ceasefire followed by political negotiations. A number of proposals were put forward. The International Crisis Group, for instance, where I worked at the time, published a statement on 10 March arguing for a two-point initiative: (i) the formation of a contact group or committee drawn from Libya’s North African neighbours and other African states with a mandate to broker an immediate ceasefire; (ii) negotiations between the protagonists to be initiated by the contact group and aimed at replacing the current regime with a more accountable, representative and law-abiding government. This proposal was echoed by the African Union and was consistent with the views of many major non-African states – Russia, China, Brazil and India, not to mention Germany and Turkey. It was restated by the ICG in more detail (adding provision for the deployment under a UN mandate of an international peacekeeping force to secure the ceasefire) in an open letter to the UN Security Council on 16 March, the eve of the debate which concluded with the adoption of UNSC Resolution 1973. In short, before the Security Council voted to approve the military intervention, a worked-out proposal had been put forward which addressed the need to protect civilians by seeking a rapid end to the fighting, and set out the main elements of an orderly transition to a more legitimate form of government, one that would avoid the danger of an abrupt collapse into anarchy, with all it might mean for Tunisia’s revolution, the security of Libya’s other neighbours and the wider region. The imposition of a no-fly zone would be an act of war: as the US defense secretary, Robert Gates, told Congress on 2 March, it required the disabling of Libya’s air defences as an indispensable preliminary. In authorising this and ‘all necessary measures’, the Security Council was choosing war when no other policy had even been tried. Why?

Many critics of Nato’s intervention have complained that it departed from the terms of Resolution 1973 and was for that reason illegal; that the resolution authorised neither regime change nor the introduction of troops on the ground. This is a misreading. Article 4 ruled out the introduction of an occupying force. But Article 42 of the 1907 Hague Regulations states that ‘territory is considered occupied when it is actually placed under the authority of the hostile army,’ a definition conserved by the 1949 Geneva Conventions. What Resolution 1973 ruled out was the introduction of a force intended to take full political and legal responsibility for the place, but that was never the intention; ground forces were indeed eventually introduced, but they have at no point accepted political or legal responsibility for anything and so fall short of the conventional definition of an occupying force. It may be that this misreading of the resolution was connived at by the governments that drafted it in order to secure the best (or least bad) tally of votes in favour on 17 March; this would of course be only one instance of the sophistry to which the *metteurs en scène* of intervention have resorted. And regime change was tacitly covered by the phrase ‘all necessary measures’. That this was the right way to read the resolution had already been made clear by the stentorian rhetoric of Cameron and Hague, Sarkozy and Juppé, and Obama and Clinton in advance of the Security Council vote. Since the issue was defined from the outset as protecting civilians from Gaddafi’s murderous onslaught ‘on his own people’, it followed that effective protection required the elimination of the threat, which was Gaddafi himself for as long as he was in power (subsequently revised to ‘for as long as he is in Libya’ before finally becoming ‘for as long as he is alive’). From the attitudes struck by the Western powers in the run-up to the Security Council debate, it was evident that the cleverly drafted resolution tacitly authorised a war to effect regime change. Those who subsequently said that they did not know that regime change had been authorised either did not understand the logic of events or were pretending to misunderstand in order to excuse their failure to oppose it. By inserting ‘all necessary measures’ into the resolution, London, Paris and Washington licensed themselves, with Nato as



their proxy, to do whatever they wanted whenever they wanted in the full knowledge that they would never be held to account, since as permanent veto-holding members of the Security Council they are above all laws.

In two respects the conduct of the Western powers and Nato did indeed appear explicitly to violate the terms of Security Council resolutions. The first instance was the repeated supply of arms to the rebellion by France, Qatar, Egypt (according to the *Wall Street Journal*) and no doubt various other members of the ‘coalition of the willing’ in what seemed a clear breach of the arms embargo imposed by the Security Council in Articles 9, 10 and 11 of Resolution 1970 passed on 26 February and reiterated in Articles 13, 14 and 15 of Resolution 1973. It was later explained that Resolution 1973 superseded 1970 in this respect and that the magic phrase ‘all necessary measures’ licensed the violation of the arms embargo; thus Article 4 of Resolution 1973 trumped Articles 13 to 15 of the same resolution. In this way it was arranged that any state might supply arms to the rebels while none might do so to the Libyan government, which by that time had been decreed illegitimate by London, Paris and Washington. Scarcely anyone has drawn attention to the second violation.

The efforts of the ICG and others seeking an alternative to war did not go entirely unnoticed. Apparently their proposals made some impression on the less gung-ho members of the Security Council, and so a left-handed homage was paid them by the drafters of Resolution 1973. In the final version – unlike any earlier ones – the idea of a peaceful solution was incorporated in the first two articles, which read:

[The Security Council ...]

(1) *Demands* the immediate establishment of a ceasefire and a complete end to violence and all attacks against, and abuses of, civilians; (2) *Stresses* the need to intensify efforts to find a solution to the crisis which responds to the legitimate demands of the Libyan people and notes the decisions of the secretary-general to send his special envoy to Libya and of the Peace and Security Council of the African Union to send its ad hoc High Level Committee to Libya with the aim of facilitating dialogue to lead to the political reforms necessary to find a peaceful and sustainable solution.

In this way Resolution 1973 seemed to be actively envisaging a peaceful alternative as its first preference, while authorising military intervention as a fallback if a ceasefire was refused. In reality, nothing could have been further from the truth.

Resolution 1973 was passed in New York late in the evening of 17 March. The next day, Gaddafi, whose forces were camped on the southern edge of Benghazi, announced a ceasefire in conformity with Article 1 and proposed a political dialogue in line with Article 2. What the Security Council demanded and suggested, he provided in a matter of hours. His ceasefire was immediately rejected on behalf of the NTC by a senior rebel commander, Khalifa Haftar, and dismissed by Western governments. ‘We will judge him by his actions not his words,’ David Cameron declared, implying that Gaddafi was expected to deliver a complete ceasefire by himself: that is, not only order his troops to cease fire but ensure this ceasefire was maintained indefinitely despite the fact that the NTC was refusing to reciprocate. Cameron’s comment also took no account of the fact that Article 1 of Resolution 1973 did not of course place the burden of a ceasefire exclusively on Gaddafi. No sooner had Cameron covered for the NTC’s unmistakable violation of Resolution 1973 than Obama weighed in, insisting that for Gaddafi’s ceasefire to count for anything he would (in addition to sustaining it indefinitely, single-handed, irrespective of the NTC) have to withdraw his forces not only from Benghazi but also from Misrata and from the most important towns his troops had retaken from the rebellion, Ajdabiya in the east and Zawiya in the west – in other words, he had to accept strategic defeat in advance. These conditions, which were impossible for Gaddafi to accept, were absent from Article 1.

Cameron and Obama had made clear that the last thing they wanted was a ceasefire, that the NTC could violate Article 1 of the resolution with impunity and that in doing so it would be acting with the agreement of its Security Council sponsors. Gaddafi’s first ceasefire offer came to nothing, as did his second offer of 20 March. A week later, Turkey, which had been working within the Nato framework to help organise the

provision of humanitarian aid to Benghazi, announced that it had been talking to both sides and offered to broker a ceasefire. The offer was given what Ernest Bevin would have called 'a complete ignoral' and nothing came of it either, as nothing came of a later initiative, seeking a ceasefire and negotiations (to which Gaddafi explicitly agreed), undertaken by the African Union in April. It too was rejected out of hand by the NTC, which demanded Gaddafi's resignation as a condition of any ceasefire. This demand went beyond even Obama's earlier list of conditions, none of which had figured in Resolution 1973. More to the point, it was a demand that made a ceasefire impossible, since securing a ceasefire requires commanders with decisive authority over their armies, and removing Gaddafi would have meant that no one any longer had overall authority over the regime's forces.

By incorporating the alternative non-violent policy proposals in its text, the Western war party had been pulling a confidence trick, stringing along a few undecided states to get them to vote for the resolution on 17 March: a war to the finish, violent regime change and the end of Gaddafi had been the policy from the outset. All subsequent offers of a ceasefire by Gaddafi – on 30 April, 26 May and 9 June – were treated with the same contempt.

Those who believe in 'international law' and are happy with wars they consider 'legal' may wish to make something of this. But the crucial point here has to do with the logic of events and the policy choices associated with them. In incorporating the ICG's – or, more generally, the peace party's – suggestions into the revised text of Resolution 1973, London, Paris and Washington deftly headed off a real debate in the Security Council, one that would have considered alternatives, at the price of making their own resolution incoherent.

London, Paris and Washington could not allow a ceasefire because it would have involved negotiations, first about peace lines, peacekeepers and so forth, and then about fundamental political differences. And all this would have subverted the possibility of the kind of regime change that interested the Western powers. The sight of representatives of the rebellion sitting down to talks with representatives of Gaddafi's regime, Libyans talking to Libyans, would have called the demonisation of Gaddafi into question. The moment he became once more someone people talked to and negotiated with, he would in effect have been rehabilitated. And that would have ruled out violent – revolutionary? – regime change and so denied the Western powers their chance of a major intervention in North Africa's Spring, and the whole interventionist scheme would have flopped. The logic of the demonisation of Gaddafi in late February, crowned by the referral of his alleged crimes against humanity to the International Criminal Court by Resolution 1970 and then by France's decision on 10 March to recognise the NTC as the sole legitimate representative of the Libyan people, meant that Gaddafi was banished for ever from the realm of international political discourse, never to be negotiated with, not even about the surrender of Tripoli when in August he offered to talk terms to spare the city further destruction, an offer once more dismissed with contempt. And this logic was preserved from start to finish, as the death toll of civilians in Tripoli and above all Sirte proves. The mission was always regime change, a truth obscured by the hullabaloo over the supposedly imminent massacre at Benghazi.

The official version is that it was the prospect of a 'second Srebrenica' or even 'another Rwanda' in Benghazi were Gaddafi allowed to retake the city that forced the 'international community' (minus Russia, China, India, Brazil, Germany, Turkey et al) to act. What grounds were there for supposing that, once Gaddafi's forces had retaken Benghazi, they would be ordered to embark on a general massacre?

Gaddafi dealt with many revolts over the years. He invariably quashed them by force and usually executed the ringleaders. The NTC and other rebel leaders had good reason to fear that once Benghazi had fallen to government troops they would be rounded up and made to pay the price. So it was natural that they should try to convince the 'international community' that it was not only their lives that were at stake, but those of thousands of ordinary civilians. But in retaking the towns that the uprising had briefly wrested from the government's control, Gaddafi's forces had committed no massacres at all; the fighting had been bitter and bloody, but there had been nothing remotely resembling the slaughter at Srebrenica, let alone in Rwanda. The only known massacre carried out during Gaddafi's rule was the killing of some 1200 Islamist prisoners at Abu

Salim prison in 1996. This was a very dark affair, and whether or not Gaddafi ordered it, it is fair to hold him responsible for it. It was therefore reasonable to be concerned about what the regime might do and how its forces would behave in Benghazi once they had retaken it, and to deter Gaddafi from ordering or allowing any excesses. But that is not what was decided. What was decided was to declare Gaddafi guilty in advance of a massacre of defenceless civilians and instigate the process of destroying his regime and him (and his family) by way of punishment of a crime he was yet to commit, and actually unlikely to commit, and to persist with this process despite his repeated offers to suspend military action.

There was no question of anything that could properly be described as ethnic cleansing or genocide in the Libyan context. All Libyans are Muslims, the majority of Arab-Berber descent, and while the small Berber-speaking minority had a grievance concerning recognition of its language and identity (its members are Ibadi, not Sunni, Muslims), this was not what the conflict was about. The conflict was not ethnic or racial but political, between defenders and opponents of the Gaddafi regime; whichever side won could be expected to deal roughly with its adversaries, but the premises for a large-scale massacre of civilians on grounds of their ethnic or racial identity were absent. All the talk about another Srebrenica or Rwanda was extreme hyperbole clearly intended to panic various governments into supporting the war party's project of a military intervention in order to save the rebellion from imminent defeat.

Why did the panic factor work so well with international, or at any rate Western, public opinion and especially governments? It is reliably reported that Obama's fear of being accused of allowing another Srebrenica tipped the scales in Washington when not only Robert Gates but also, initially, Hillary Clinton had resisted US involvement. I believe the answer is that Gaddafi had already been so thoroughly demonised that the wildest accusations about his likely (or, as many claimed, certain) future conduct would be believed whatever his actual behaviour. This demonisation took place on 21 February, the day all the important cards were dealt.

On 21 February the world was shocked by the news that the Gaddafi regime was using its airforce to slaughter peaceful demonstrators in Tripoli and other cities. The main purveyor of this story was al-Jazeera, but the story was quickly taken up by the Sky network, CNN, the BBC, ITN et al. Before the day was over the idea of imposing a no-fly zone on Libya was widely accepted, as was the idea of a Security Council resolution imposing sanctions and an arms embargo, freezing Libya's assets and referring Gaddafi and his associates to the ICC on charges of crimes against humanity. Resolution 1970 was duly passed five days later and the no-fly zone proposal monopolised international discussion of the Libyan crisis from then on.

Many other things happened on 21 February. Zawiya was reported to be in chaos. The minister of justice, Mustafa Abdul Jalil, resigned. Fifty Serbian workers were attacked by looters. Canada condemned 'the violent crackdowns on innocent demonstrators'. Two airforce pilots flew their fighters to Malta claiming they did so to avoid carrying out an order to bomb and strafe demonstrators. By late afternoon regime troops and snipers were reliably reported to be firing on crowds in Tripoli. Eighteen Korean workers were wounded when their place of work was attacked by a hundred armed men. The European Union condemned the repression, followed by Ban Ki-moon, Nicolas Sarkozy and Silvio Berlusconi. Ten Egyptians were reported to have been killed by armed men in Tobruk. William Hague, who had condemned the repression the previous day (as had Hillary Clinton), announced at a press conference that he had information that Gaddafi had fled Libya and was en route to Venezuela. The Libyan ambassador to Poland stated that defections from the armed forces as well as the government could not be stopped and Gaddafi's days were numbered. Numerous media outlets carried the story that Libya's largest tribe, the Warfalla, had joined the rebellion. Libya's ambassadors to Washington, India, Bangladesh and Indonesia all resigned, and its deputy ambassador to the UN, Ibrahim Dabbashi, rounded off the day by calling a news conference at Libya's mission in New York and claimed that Gaddafi had 'already started the genocide against the Libyan people' and was flying in African mercenaries. It was Dabbashi more than anyone else who, having primed his audience in this way, launched the idea that the UN should impose a no-fly zone and the ICC should investigate Gaddafi's 'crimes against humanity and crimes of war'.



At this point the total death toll since 15 February was 233, according to Human Rights Watch. The Fédération Internationale des Droits de l'Homme suggested between 300 and 400 (but it also announced the same day that Sirte had fallen to the rebels). We can compare these figures with the total death toll in Tunisia (300) and Egypt (at least 846). We can also compare both HRW's and FIDH's figures with the death toll, plausibly estimated at between 500 and 600, of the seven days of rioting in Algeria in October 1988, when the French government rigorously refrained from making any comment on events. But the figures were beside the point on 21 February; it was impressions that counted. The impression made by the story that Gaddafi's airforce was slaughtering peaceful protesters was huge, and it was natural to take the resignations of Abdul Jalil and the ambassadors, the flight of the two pilots, and especially Dabbashi's dramatic declaration about genocide as corroborating al-Jazeera's story.

Goodies and baddies (to use Tony Blair's categories) had been clearly identified, the Western media's outraged attention totally engaged, the Security Council urgently seized of the matter, the ICC primed to stand by, and a fundamental shift towards intervention had been made – all in a matter of hours. And quite right too, many may say. Except that the al-Jazeera story was untrue, just as the story of the Warfalla's siding with the rebellion was untrue and Hague's story that Gaddafi was fleeing to Caracas was untrue. And, of course, Dabbashi's 'genocide' claim was histrionic rubbish which none of the organisations with an interest in the use of the term was moved to challenge.

These considerations raise awkward questions. If the reason cited by these ambassadors and other regime personnel for defecting on 21 February was false, what really prompted them to defect and make the declarations they did? What was al-Jazeera up to? And what was Hague up to? A serious history of this affair when more evidence comes to light will seek answers to these questions. But I don't find it hard to understand that Gaddafi and his son should suddenly have resorted to such fierce rhetoric. They clearly believed that, far from confronting merely 'innocent demonstrators' as the Canadians had it, they were being destabilised by forces acting to a plan with international ramifications. It is possible that they were mistaken and that everything was spontaneous and accidental and a chaotic muddle; I do not pretend to know for sure. But there had been plans to destabilise their regime before, and they had grounds for thinking that they were being destabilised again. The slanted coverage in the British media in particular, notably the insistence that the regime was faced only by peaceful demonstrators when, in addition to ordinary Libyans trying to make their voices heard non-violently, it was facing politically motivated as well as random violence (e.g. the lynching of 50 alleged mercenaries in al-Baida on 19 February), was consistent with the destabilisation theory. And on the evidence I have since been able to collect, I am inclined to think that destabilisation is exactly what was happening.

In the days that followed I made efforts to check the al-Jazeera story for myself. One source I consulted was the well-regarded blog *Informed Comment*, maintained and updated every day by Juan Cole, a Middle East specialist at the University of Michigan. This carried a post on 21 February entitled 'Qaddafi's bombardments recall Mussolini's', which made the point that 'in 1933-40, Italo Balbo championed aerial warfare as the best means to deal with uppity colonial populations.' The post began: 'The strafing and bombardment in Tripoli of civilian demonstrators by Muammar Gaddafi's fighter jets on Monday ...', with the underlined words linking to an article by Sarah El Deeb and Maggie Michael for Associated Press published at 9 p.m. on 21 February. This article provided no corroboration of Cole's claim that Gaddafi's fighter jets (or any other aircraft) had strafed or bombed anyone in Tripoli or anywhere else. The same is true of every source indicated in the other items on Libya relaying the aerial onslaught story which Cole posted that same day.

I was in Egypt for most of the time, but since many journalists visiting Libya were transiting through Cairo, I made a point of asking those I could get hold of what they had picked up in the field. None of them had found any corroboration of the story. I especially remember on 18 March asking the British North Africa expert Jon Marks, just back from an extended tour of Cyrenaica (taking in Ajdabiya, Benghazi, Brega, Derna and Ras Lanuf), what he had heard about the story. He told me that no one he had spoken to had mentioned it. Four days later, on 22 March, *USA Today* carried a striking article by Alan Kuperman, the author of *The Limits of*





Humanitarian Intervention and coeditor of *Gambling on Humanitarian Intervention*. The article, 'Five Things the US Should Consider in Libya', provided a powerful critique of the Nato intervention as violating the conditions that needed to be observed for a humanitarian intervention to be justified or successful. But what interested me most was his statement that 'despite ubiquitous cellphone cameras, there are no images of genocidal violence, a claim that smacks of rebel propaganda.' So, four weeks on, I was not alone in finding no evidence for the aerial slaughter story. I subsequently discovered that the issue had come up more than a fortnight earlier, on 2 March, in hearings in the US Congress when Gates and Admiral Mike Mullen, chairman of the Joint Chiefs of Staff, were testifying. They told Congress that they had no confirmation of reports of aircraft controlled by Gaddafi firing on citizens.

The story was untrue, just as the story that went round the world in August 1990 that Iraqi troops were slaughtering Kuwaiti babies by turning off their incubators was untrue and the claims in the sexed-up dossier on Saddam's WMD were untrue. But as Mohammed Khider, one of the founders of the FLN, once remarked, 'when everyone takes up a falsehood, it becomes a reality.' The rush to regime change by war was on and could not be stopped.

The intervention tarnished every one of the principles the war party invoked to justify it. It occasioned the deaths of thousands of civilians, debased the idea of democracy, debased the idea of law and passed off a counterfeit revolution as the real thing. Two assertions that were endlessly reiterated – they were fundamental to the Western powers' case for war – were that Gaddafi was engaged in 'killing his own people' and that he had 'lost all legitimacy', the latter presented as the corollary of the former. Both assertions involved mystifications.

'Killing his own people' is a hand-me-down line from the previous regime change war against Saddam Hussein. In both cases it suggested two things: that the despot was a monster and that he represented nothing in the society he ruled. It is tendentious and dishonest to say simply that Gaddafi was 'killing his own people'; he was killing those of his people who were rebelling. He was doing in this respect what every government in history has done when faced with a rebellion. We are all free to prefer the rebels to the government in any given case. But the relative merits of the two sides aren't the issue in such situations: the issue is the right of a state to defend itself against violent subversion. That right, once taken for granted as the corollary of sovereignty, is now compromised. Theoretically, it is qualified by certain rules. But, as we have seen, the invocation of rules (e.g. no genocide) can go together with a cynical exaggeration and distortion of the facts by other states. There are in fact no reliable rules. A state may repress a revolt if the permanent veto-holding powers on the Security Council allow it to (e.g. Bahrain, but also Sri Lanka) and not otherwise. And if a state thinks it can take this informal authorisation to defend itself as read because it is on good terms with London, Paris and Washington and is honouring all its agreements with them, as Libya was, it had better beware. Terms can change without warning from one day to the next. The matter is now arbitrary, and arbitrariness is the opposite of law.

The idea that Gaddafi represented nothing in Libyan society, that he was taking on his entire people and his people were all against him was another distortion of the facts. As we now know from the length of the war, the huge pro-Gaddafi demonstration in Tripoli on 1 July, the fierce resistance Gaddafi's forces put up, the month it took the rebels to get anywhere at all at Bani Walid and the further month at Sirte, Gaddafi's regime enjoyed a substantial measure of support, as the NTC did. Libyan society was divided and political division was in itself a hopeful development since it signified the end of the old political unanimity enjoined and maintained by the Jamahiriyya. In this light, the Western governments' portrayal of 'the Libyan people' as uniformly ranged against Gaddafi had a sinister implication, precisely because it insinuated a new Western-sponsored unanimity back into Libyan life. This profoundly undemocratic idea followed naturally from the equally undemocratic idea that, in the absence of electoral consultation or even an opinion poll to ascertain the Libyans' actual views, the British, French and American governments had the right and authority to determine who was part of the Libyan people and who wasn't. No one supporting the Gaddafi regime counted. Because they were not part of 'the Libyan people' they could not be among the civilians to be





protected, even if they were civilians as a matter of mere fact. And they were not protected; they were killed by Nato air strikes as well as by uncontrolled rebel units. The number of such civilian victims on the wrong side of the war must be many times the total death toll as of 21 February. But they don't count, any more than the thousands of young men in Gaddafi's army who innocently imagined that they too were part of 'the Libyan people' and were only doing their duty to the state counted when they were incinerated by Nato's planes or extra-judicially executed en masse after capture, as in Sirte.

The same contempt for democratic principle characterised the repeated declarations in the West that Gaddafi had 'lost all legitimacy'. Every state needs international recognition and to that extent depends on external sources of legitimation. But the democratic idea gives priority to national over international legitimacy. With their claim of lost legitimacy the Western powers were not only pre-empting an eventual election in Libya which would ascertain the true balance of public opinion, they were mimicking the Gaddafi regime: in the Jamahiriyya the people were liable to be trumped by the Revolution as a source of superior legitimacy.

'If you break it, you own it,' Colin Powell famously remarked, in order to alert the Beltway to the risks of a renewed war against Iraq. The lesson of the mess in Iraq has been learned, at least to the extent that the Western powers and Nato have repeatedly insisted that the Libyan people – the NTC and the revolutionary militias – own their revolution. So, not owning Libya after the fall of Gaddafi, Nato and London and Paris and Washington cannot be accused of breaking it or be held responsible for the debris. The result is a shadow play. The NTC occupies centre stage in Libya, but since February every key decision has been made in the Western capitals in consultation with the other, especially Arab, members of the 'contact group' meeting in London or Paris or Doha. It is unlikely that the structure of power and the system of decision-making which have guided the 'revolution' since March are going to change radically. And so unless something happens to upset the calculations that have brought Nato and the NTC this far, what will probably emerge is a system of dual power in some ways analogous to that of the Jamahiriyya itself, and similarly inimical to democratic accountability. That is, a system of formal decision-making about secondary matters acting as a façade for a separate and independent, because offshore, system of decision-making about everything that really counts (oil, gas, water, finance, trade, security, geopolitics) behind the scenes. Libya's formal government will be a junior partner of the new Libya's Western sponsors. This will be more of a return to the old ways of the monarchy than to those of the Jamahiriyya.

<http://www.lrb.co.uk/v33/n22/hugh-roberts/who-said-gaddafi-had-to-go>



Weird World of Water Gets a Little Weirder



Water. Scientists are reporting that H₂O, when chilled below the freezing point, can shift into a new type of liquid. (Credit: © Adam Borkowski / Fotolia)

ScienceDaily (Nov. 9, 2011) — Strange, stranger, strangest! To the weird nature of one of the simplest chemical compounds -- the stuff so familiar that even non-scientists know its chemical formula -- add another odd twist. Scientists are reporting that good old H₂O, when chilled below the freezing point, can shift into a new type of liquid.

The report appears in ACS' *Journal of Physical Chemistry B*.

Pradeep Kumar and H. Eugene Stanley explain that water is one weird substance, exhibiting more than 80 unusual properties, by one count, including some that scientists still struggle to understand. For example, water can exist in all three states of matter (solid, liquid, gas) at the same time. And the forces at its surface enable insects to walk on water and water to rise up from the roots into the leaves of trees and other plants.

In another strange turn, scientists have proposed that water can go from being one type of liquid into another in a so-called "liquid-liquid" phase transition, but it is impossible to test this with today's laboratory equipment because these things happen so fast. That's why Kumar and Stanley used computer simulations to check it out.

They found that when they chilled liquid water in their simulation, its propensity to conduct heat decreases, as expected for an ordinary liquid. But, when they lowered the temperature to about 54 degrees below zero Fahrenheit, the liquid water started to conduct heat even better in the simulation. Their studies suggest that below this temperature, liquid water undergoes sharp but continuous structural changes whereas the local structure of liquid becomes extremely ordered -- very much like ice. These structural changes in liquid water lead to increase of heat conduction at lower temperatures.



The researchers say that this surprising result supports the idea that water has a liquid-liquid phase transition.

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1. Pradeep Kumar, H. Eugene Stanley. **Thermal Conductivity Minimum: A New Water Anomaly.** *The Journal of Physical Chemistry B*, 2011; 111013123335006 DOI: [10.1021/jp2051867](https://doi.org/10.1021/jp2051867)

<http://www.sciencedaily.com/releases/2011/11/111109111536.htm>



Grey Panic

T.J. Clark

A couple of nights before I first saw the Richter show at Tate Modern I had been at the Festival Hall listening to Boulez conduct his *Pli selon pli*. I felt then, as the octogenarian directed us through his atrocious and wonderful labyrinth, that it was sheer luck – the luck of a lifetime – to have caught this last intransigence of modernism on the wing. When the soprano sang the final word of Mallarmé's 'Un peu profond ruisseau calomnié la mort', with her voice disappearing in a ghost-story gasp, I thought I heard a whole culture refusing to go gracefully. The German's tone is different from the Frenchman's: more wounded and muffled and sardonic and naive, less pedagogical, less deeply immersed in the agony that gave rise to modernism in the first place. Richter's Duchamp is a poor substitute for Boulez's Mahler. But the two old men are comparable. Hearing the one and looking at the other I was sure that the nature of a vanished century, and the survival of the claim to art it gave rise to – the full recognition of the improbability of the claim – were at stake.

The retrospective of Richter's work at Tate Modern is a great event. It is beautifully hung by Mark Godfrey and Nicholas Serota: packed tight and relentless room after room, by the end exhausting, and in this entirely true to Richter's half-century of effort. The selection of work could not be better, with things often seen before enlivened by juxtaposition with the unfamiliar (to me), and the sequence presented with the minimum of wall-label stage direction. MoMA in New York has lent the show its necessary still centre, the terrible grey room entitled *18 October 1977*, which approaches (any verb here will be too weak and too strong) the evidence left behind from the deaths and destruction of the Red Army Faction. The loan is generous – the 15 paintings would be any museum's pride – but one senses that MoMA's curators saw immediately that this was a one-time chance.

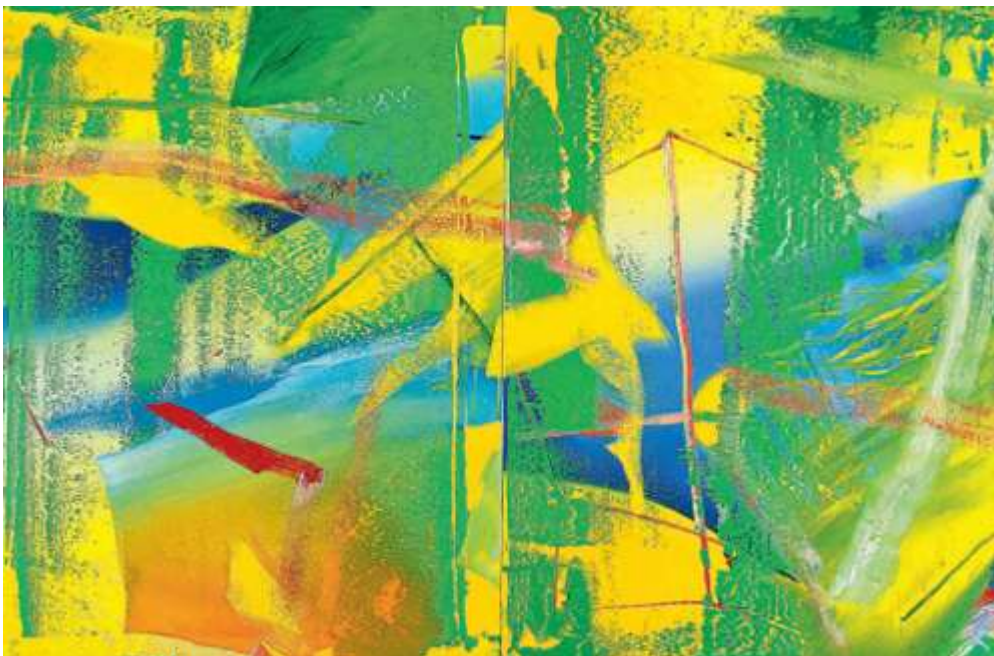


'Confrontation 2' and 'Confrontation 3' (1988)

Listening to Boulez, I immediately feel that only a fool could doubt that this is the necessary and sufficient response to the death of tonality, and to the death of 'expressiveness' it enacted. This may be my ignorance of music – I'm easily overpowered. With Richter there can be no such certainty. I cannot imagine a viewer emerging from the rooms at Tate Modern and being sure that Richter's endless hovering around the fact of the photograph – his subservience and aggression towards the medium – had solved, or even properly framed, the problem of 'painting and figuration' in our time. Nor do I think that a viewer will come out of the show convinced – or even decided that Richter means us to be convinced – that the artist's version of abstract

painting really does dig back into the lost territory of painterly ‘expression’ (or immediacy, or individuality, or sheer delight) to mine it again against the odds. Is this the difference between music and painting? Perhaps. Music seems to me ultimately nothing if not, on the other side of modernist doubt and pedagogy (and those have been fiercer in music than any other art form), unforgivable raw emotion. Painting by contrast really can, for reasons I am unable to fathom, make its uncertainty – its long depressive state – into something beautiful as opposed to correct or clever. John Cage, for some of us, is an even lesser god than Duchamp, but in the final room at Tate, where a suite of big abstracts done under Cage’s auspices is hung, it does not matter. The imperfect lushness of the canvases, each nearly ten feet square (the way, in the best of them, dubiousness and hedonism coexist), leaves the ‘Is it Art?’ starting point far behind.

The show is enormous. All a review can hope to do is ask a few leading questions of it, and most of these have been asked before, in a literature that is already overwhelming (and often good). Right from the start of the exhibition, in the two small rooms – they feel appropriately stifling – full of Richter’s mostly monochrome oils done from photographs in the 1960s, two questions occur. First, what is Richter’s immersion in the mostly dreary photographic material for? Second, what does his paintings’ elaborate distancing from the feel of the photographic – the blurring and smearing, the way black and white seem to drift towards a weaker, less inflected, more listless overall grey – end up achieving? What does the artist do to the ‘photographic’ and the ‘painted’, as he receives the categories from the culture at large?



‘Yellow-green’ (1982)

The questions crop up naturally, but this does not mean they are the right ones. Not on their own, anyway, and not asked separately. The idea of working from the photograph seems in Richter, again from the beginning, to have been bound up with the idea of almost painting things out. A kind of botched concealment comes from the photograph as if it were its inner perfume. The photographic seems much of the time to be another word for the lifeless. Some orgy ... Some tiger ... The draining away of chroma is a figure for a general lapsing out of spatial (and therefore social) relationship. The liberated young women displaying their genitals and the uncle smirking in his Nazi uniform are equally near or far away, equally ‘scandalous’ (it says here in the paper), equally unfelt. The photo-language is archaic: that is what the dim monochrome suggests to me most powerfully. It speaks to a false fixation on the past – maybe that of a refugee from East Germany, maybe that of post-Hitler Germany in general. Family secrets, hearts of darkness, a desperate cocking a snook (is that the

right word?) at one's compromised parents. Richter's is a world where even fetishism does not work: the shine on the nose of appearance, which one or two canvases bring on emblematically – ineffectively – can do nothing against philosophy, or art after Auschwitz, painting its grey on grey. That cliché again ...

Perhaps I have pulled out the stops of despair and disorientation in the last paragraph, but not by much. Richter's 1960s is a horrible decade. His past in the DDR seems to cling to him, and always he turns from the imagery of the future on offer in the world he has chosen – the new freedom and equality of the children in the porn shots – with a shudder. The Red Army Faction is near. There are some cityscapes painted in 1968 and 1969, in particular *Stadtbild SL* (from which Luc Tuymans learned brilliantly), where all the achieved non-life of modernity is painted with a truly chilling lack of affect, as if seen by a sociopath looking through the sights of a gun.

Two points follow. First, this is the matrix from which the big coloured abstracts emerge in the following decade: they make no sense, in my view, unless they are seen against this background of grey panic. Second – same point, essentially – the *18 October 1977* paintings are long prepared. They return to Richter's fundamental, and persistent, sense of his own time. Whether painting in general, for him, is essentially a way of keeping that sense from overwhelming him – he sometimes says so, but what else would he say? – or of showing the sense (the erasure) infiltrating everything, even the boldest and blithest claim to pleasure: that is the question the show goes on not answering. To its credit, I think.



'Two Couples' (1966)

The word 'blur' has come up. 'Richter's blur', it is called in the literature. Again, the term may be insufficient. When one gets to the moment in the show when Richter reinvents his 'blur' in the context of abstract painting – the two versions of *Abstraktes Bild* from 1977 are particularly astonishing, and still hard to look at – it is immediately clear how far from a description of what happens in the paintings, and what its effect might be on the viewer, the monosyllable is. Critics have come up with alternatives. In the context of abstraction – that strange episode in art's endgame – all the suggestions seem charged. Have we to do, for instance, with some kind of deliberate loss of focus or of register? Maybe with a form of willed inaccuracy on

the artist's part. Or even vagueness. This last, it might seem, is very much not a modern art value; though that might mean Richter was right to try to make it one. I like the story Richard Rorty told against himself late in life, when he heard that a philosophy department had just hired someone whose speciality was vagueness, and he raised an eyebrow. 'Dick, you're really out of it,' his host said. 'Vagueness is huge.'

Emptiness, by contrast, is a condition that modernism treasures. *Pli selon pli* reminds one of that. But I am not aware of an artist before Richter who tries to make pictorial intensity out of a kind of fullness – a stuffed-fullness, or at least a heavy impenetrability – that has no specific substance to its parts, no feeling of its constituent colours and textures having been hit precisely by the maker, and fixed inevitably, in all their unique particularity. (This is different from large generalisation, which abstract painting thrives on. Clyfford Still and Mark Rothko generalise, but they expect us to assent to the idea that breadth of touch and emptying of detail are ways, for them, towards specificity of feeling – emotion really happening – rescued from culture-industry mush.) Richter is the painter at the furthest remove, I reckon, from Adorno's sense that the whole and only point of art is always to find – to instantiate – concrete particularity in a world of false vividness. Vividness for Richter, if it comes, will have to have falsity written deep within it. I guess this is the strong side (the genuinely disabused-of-illusion side) of his Duchampianism.

The *18 October 1977* series was painted in 1988 and first shown the following year. It provoked a good old 19th-century storm of criticism. Richter had tried to sanctify a bunch of irrelevant psychopaths, some said; he had wallowed in an episode the nation was right to put behind it; he had sucked a set of revolutionaries, however misguided and ruthless, into the grey maw of his private (petit bourgeois) nihilism. And so on. The fact that many of the criticisms were crude and crass does not mean that all of them were. 'Wallowed', more or less without the pejorative, is not a bad descriptive term. The out-of-focus *Funeral*, largest and muddiest of the paintings on show, the one that might seem to be reaching, at least in terms of scale and subject, for the public register of Goya's *Third of May*, brings on (in me) a feeling of utter impotence and incomprehension. Perhaps Richter *is* a petit bourgeois nihilist: the question the righteous leftist commentators might have asked themselves, however, is what the nerveless attitude allows him to 'say' about neo-Leninism; whether nihilism (whatever its class ascription) is now the only vantage point from which the ghost dance of revolution can be chronicled.



'Betty' (1997)



I think the Red Army Faction paintings are Richter's masterpieces, but I mistrust that judgment in myself. Richter's art had been waiting, so it seems, for this occasion, and critics like me (with their own settling of accounts with the 1960s still incomplete) could not bear, but could not put down, the result. One side of me still pulls away from the force field. It is too obvious, the funeral hymn: too belated, too grey and neutral, too Olympian, too ready with affect after the danger has passed. Maybe nobody wanted to see the familiar greyness and vagueness of Richter's painting – these essentially small things, these facts of art – suddenly lungeing for the epic. Surely Richter of all people had taught us that metaphor in painting – the colour grey being 'lifeless', for instance – had to be deeply embedded, almost indecipherable, if it was to work. But in *18 October 1977* metaphor is rampant. Grey does the work of mourning. It and the blur stand for dirty, but also sterilised, secrets. Lifelessness is literalised: it *appeals* to us: it is given a look from beyond the grave. Politics is a foul turbulence, with atrocity happening off-stage. These are mugshots from an anarchist archive. Concealment. Obstruction. Fading. Take a look at the pseudo-poignant record player (a record player!) with *Winterreise* or 'Street Fighting Man' stopped on the time-turntable.

I do not think I am inventing, or working up, these moments of revulsion. And they do not go away: there is no artistic *aufheben*. Our dealings with Baader and Ensslin and Meinhof, and with Richter's daring to have them be Art, are – horrible word, but completely appropriate – compromised. The way to an attitude to revolution is via some weird, unjustifiable mixture of distance – 'I know nothing, really, just glimpse the odd misery through the murk' – and full-blast foghorn pity and fear. Don't ask me why the latter movement is irresistible, but it is. The three paintings of Gudrun Ensslin called *Gegenüberstellung* are as close to a conjuring of the dead as I have seen in painting. 'Confrontation' is a perfectly good translation, but so would be the more matter of fact 'Opposition', which hangs on to the noun's inner dynamics of 'facing', 'standing across from', 'being in front of' (that damn camera). I hate the soft focus of *Opposition 1*. It seems to me to hedge its humanitarian bets. But maybe it was necessary as a starting point – an emotional nowhere – from which Ensslin in all her craziness and vulnerability and courage and self-righteousness could then emerge, to address us, to stand opposite and laugh. The two later *Oppositions*, I sometimes think, are the only pictures of people done in our time that the future will care to look at – though not for long. They are Géricault's *Mad Portraits* reinvented.

Writing on Richter inevitably gravitates to the Baader-Meinhof paintings, but should not end with them. For they only make sense – become more understandable, or maybe unforgivable – in relation to the big blazing abstractions in the rooms next door. The two modes glower and wink at one another. It was touching a few weeks ago to hear Benjamin Buchloh – a longtime friend and critic of Richter, with whose interpretations of his painting Richter has sometimes struggled – saying that he thought now he had got it wrong, in a famous interview with the artist, when he called his abstractions parodies. No doubt the word is too conclusive. But the feeling that Richter's relationship to abstraction is deeply peculiar will not go away. Is he serious, the paintings seem to ask. And what is seriousness, in abstraction? Perhaps it involves calling into question the kind of seriousness abstract art usually goes in for – its Red Army Faction sententiousness, that is.

What, on the evidence, does Richter take the 'abstract' to be? He knows, for sure, what it had meant to his great predecessors: for them, in the high days of modernism, it had been essentially a way out of the generic and secondhand towards the actually made and felt in painting, here, on the surface, with this and this material. It aspired to a made-ness made without rules, without any notion of 'the picture' preceding the picture itself. Abstract painting's strength, we could say, was the way it inherited the central 19th-century dream – of pictures, whatever was meant by 'pictures', coming to exist in the moment, with weather and light forcing them into being. If the moment teased and elated the picture sufficiently – this was the hope – there might be a chance of its escaping the half-world (the greyness) of ideology. Richter divests himself of this hope, this strength. The vagueness of his first abstractions, it follows, is as strange and reckless a turning – a weakening – as any artist has risked.

Does the risk pay off? Not always, I think, but sometimes triumphantly. In the best abstractions weakness is all. Of course no artist could have gone on decade after decade painting in this manner without reinventing a



version of abstract art's original false confidence. Weakness in Richter, when we get to the 1980s, is often replaced by blatancy and the blaring of trumpets. Paintings like *Yellow-green* (1982) or *June* (1983) are at one level – I hang onto Buchloh's intuition – parodies of Kandinsky's or de Kooning's charged vividness. Parodies, and therefore acts of homage, shaking their heads in wonder and disbelief (and impatience and envy and tolerant amusement) at abstraction's first impudence and naivety. Perhaps we could say that abstract art had always been parody – parody Plato, parody Monet or Moreau, parody *Songs without Words* – and what Richter did was return and return to the fact, as puzzle and instigation.



'Cage (4)' (2006)

The show has many other aspects. I have said nothing, for example, of the mostly small or mid-size canvases done 'from' colour photographs from the 1970s on: intimate, homely, often unsettlingly harmless things – *Betty, Barn, Candle, Flowers, Meadowland*, wife and baby, old friends. Seeing them in the vicinity of Gudrun Ensslin is bound to make the harmlessness uncanny. Not ironic or clinical or coldly 'aesthetic', in my view – the candle shines steadily, Betty (Richter's daughter) is nobody's puppet – but nonetheless pictures that ask us, in a just detectable whisper, not to believe in them too much. The most tender and touching of the Betty paintings – oil on wood, 12 by 15 inches, with Betty's small face tipped horizontal, as if resting on the floor, filling the rectangle, spilling towards the picture's bottom edge – is hung low in a room filled with shrieking abstractions. At first I thought the contrast histrionic; but I soon gave in. For it seems truly part of Richter's way of proceeding that always in him the abstract and figurative edge towards some such stage-managed *Confrontation* – intimacy versus alienation, flesh-paleness versus 'virtual' pink and yellow, love versus kicks.

Over the past two decades Richter's work has revolved around a new type of abstraction, with almost the look of a signature style. For the master of incompatibilities, this is worrying. The paintings are mostly large, with what appear to be one-colour or two-colour backgrounds, across which has been dragged (by a series of squeegees, some of them giant) an abraded curtain of greens, greys, reds, purples, electric yellows. It is a



strange world. We might be looking into a window from a speeding car, or scanning a surface through an electron microscope, looking for structure and not finding it. Again, there is something in this I recoil from. The word 'glazing' comes up; but glazing – that precious resource of oil painters from Burgundy on, in which colour was given depth and intensity by being made to shine through a foreground translucency – now botched, magnified, hypertrophied, presented to us as 'device'. ('Glazing' as in eyes glazing over.) The paintings, alas, have a corporate glossiness. But Richter does not stand still. In the *Cage* room I found myself suddenly reminded of collages made in Paris in the mid-1950s, by flâneurs obsessed by the capital's billboards – borrowing their layers of torn, spoiled, rainsoaked movie posters and truss advertisements. They were sentimentalists, these French (Raymond Hain and Jacques Villeglé pre-eminently), raggickers straight from the pages of *Spleen de Paris*. My guess is that Boulez would have disapproved of them. But it was moving to see their great dream of the *barrières* – their Hugo-hymn to the old city's scruffiness and provinciality and shameless loveliness – resurfacing in Richter as he gave abstraction its deathblow.

<http://www.lrb.co.uk/v33/n22/tj-clark/grey-panic>



Giant Planet Ejected from the Solar System?



Artist's impression of a planet ejected from the early solar system. (Credit: Image courtesy of Southwest Research Institute)

ScienceDaily (Nov. 10, 2011) — Just as an expert chess player sacrifices a piece to protect the queen, the solar system may have given up a giant planet and spared Earth, according to an article recently published in *The Astrophysical Journal Letters*.

"We have all sorts of clues about the early evolution of the solar system," says author Dr. David Nesvorny of the Southwest Research Institute. "They come from the analysis of the trans-Neptunian population of small bodies known as the Kuiper Belt, and from the lunar cratering record."

These clues suggest that the orbits of giant planets were affected by a dynamical instability when the solar system was only about 600 million years old. As a result, the giant planets and smaller bodies scattered away from each other.

Some small bodies moved into the Kuiper Belt and others traveled inward, producing impacts on the terrestrial planets and the Moon. The giant planets moved as well. Jupiter, for example, scattered most small bodies outward and moved inward.

This scenario presents a problem, however. Slow changes in Jupiter's orbit, such as the ones expected from interaction with small bodies, would have conveyed too much momentum to the orbits of the terrestrial planets. Stirring up or disrupting the inner solar system and possibly causing Earth to collide with Mars or Venus.

"Colleagues suggested a clever way around this problem," says Nesvorny. "They proposed that Jupiter's orbit quickly changed when Jupiter scattered off of Uranus or Neptune during the dynamical instability in the outer solar system." The "jumping-Jupiter" theory, as it is known, is less harmful to the inner solar system, because the orbital coupling between the terrestrial planets and Jupiter is weak if Jupiter jumps.

Nesvorny conducted thousands of computer simulations of the early solar system to test the jumping-Jupiter theory. He found that, as hoped for, Jupiter did in fact jump by scattering from Uranus or Neptune. When it jumped, however, Uranus or Neptune was knocked out of the solar system. "Something was clearly wrong," he says.

Motivated by these results, Nesvorny wondered whether the early solar system could have had five giant planets instead of four. By running the simulations with an additional giant planet with mass similar to that of



Uranus or Neptune, things suddenly fell in place. One planet was ejected from the solar system by Jupiter, leaving four giant planets behind, and Jupiter jumped, leaving the terrestrial planets undisturbed.

"The possibility that the solar system had more than four giant planets initially, and ejected some, appears to be conceivable in view of the recent discovery of a large number of free-floating planets in interstellar space, indicating the planet ejection process could be a common occurrence," says Nesvorny.

This research was funded by the National Lunar Science Institute and the National Science Foundation.

The paper, "Young Solar System's Fifth Giant Planet?" by Dr. David Nesvorny was published online by *The Astrophysical Journal Letters*.

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<http://www.sciencedaily.com/releases/2011/11/111110142102.htm>





What might they want?

Jenny Diski

- *The Myth and Mystery of UFOs* by Thomas Bullard
Kansas, 417 pp, £31.95, October 2010, ISBN 978 0 7006 1729 6

The problem with that ‘blue sky thinking’ we were introduced to by New Labour is that we happen to perceive the sky as blue only because of our particular physiology and arrangement of senses on this particular planet. ‘Blue sky thinking’ doesn’t so much encourage limitless imagination as embed in its own metaphor our absolute inability to think outside our perceptual and conceptual limitations. We can’t help but do it our way. We get a poor enough result when we use ‘blue sky thinking’ to figure out innovative ways to deal with economic or social problems, and do no better contemplating the possibility of life elsewhere in the universe. We think of aliens and immediately cut them down or up (or some other inconceivable dimension) to our size. They can be bigger or smaller, their heads huge, their eyes bulbous; they are usually humanoid, occasionally reptilian, but they are always recognisable as variations on the theme of life on planet earth. This is as true when we set out to imagine alien behaviour as it is when we imagine their shape.

In 1967, astronomers in Cambridge listening to deep space with their new radio telescope heard signals pulsing at precise and regular intervals. One possible explanation they came up with was that they had tapped into an invitation to say hello sent out by intelligent beings from another galaxy. Martin Ryle, the future astronomer royal, was in charge of the group. His response was unambiguous: if they had really found extra-terrestrials they should immediately dismantle the new telescope and not tell a soul about the signals, on the grounds that they wouldn’t be able to resist replying and alerting the possibly hostile aliens to our existence in this cosy, uninvaded corner of the universe. In fact, they had discovered pulsars. Stephen Hawking agrees: ‘If aliens visit us, the outcome would be much as when Columbus landed in America, which didn’t turn out well for the Native Americans.’

When the truth seems to be out there, our best bet for surviving would appear to be not to let a pin drop while circling our wagons. They might be peaceable seekers after companionship in the universe, but they might not be, and far safer to overestimate ETs’ aggressive tendencies than risk inviting Wellsian Martians or Wyndham’s triffids to do their worst. We are star stuff, and if star stuff is anything like us, it would be wise to reason, we should be very wary indeed. Ryle and Hawking aren’t the only ones who suppose that if they’re beeping us, there’s something they want, and if there’s something they want and we have it, they’ll certainly come and get it. Better to err on the side of planet survival and assume that they are greatly in advance of us technologically, and hostile. After all, they’ve been sending out radio feelers for millennia and we only got our radio telescope the other day. In relation to aliens, we invariably consider ourselves to be the junior thinkers and makers, though often we imagine we are nicer. But they are so much older and more savvy that in all likelihood they’ve used up their own planet’s resources and are looking around the universe for a handy new planet to inhabit. Ours, we think, would be just dandy for the kinds of alien we imagine. So answer them and chances are they’ll be enslaving us or harvesting us for food, interbreeding with, or genetically modifying us so that our children are born with uncanny blue eyes and an emotionless stare that turns all human hearts to stone.

That is one standard story of human contact with extra-terrestrials. Another view is that they have been watching us, even walking among us, for millennia. Quietly waiting for us to outgrow our reptilian, mammalian and higher primate incarnations until our poor homo sapiens brain finally fangled the right telescope to hear their signals. Like wise parents, or paternalist gods, they are giving us our head in adolescence and will be on hand to teach us what we really need to know about the meaning of life and the universe when we are ready (see Arthur C. Clarke and Stanley Kubrick). Or – another benevolent scenario – they are like those concerned parents who would, we’ve been told, have prevented the recent earthly riots. They have already stepped in, alarmed at the way earthling civilisation is going and have been taking steps to





prevent us blowing ourselves up or indulging ourselves to pieces. The free-will thing may have prevented us from growing as wise as we could be, but imagine what the planet would be like without their surreptitious interventions.

Aliens have nothing but contempt for us, or they love us. Oddly, they don't seem to be indifferent to us (how could anyone be?), though this is surely the best explanation for the apparent absence of signals, given – so the calculations go – that there are at least ten billion planets in the universe capable of producing intelligent life. Even this bit of arithmetic may be based on our incapacity to think beyond ourselves. A recent paper I don't pretend to understand uses 'a Bayesian analysis of the probability of abiogenesis' to show that life might, after all, be very rare; rather lax mathematical assumptions about the term 'likelihood' caused the error in the old equation. It's all maths to me, but I think this relates to the fact that the terms used for the way life might come about are based on the sole example we know of universal life, which is us and our fellow creatures on this planet.

Try as we might to imagine ETs that are not like us, we remain the baseline. In *The Myth and Mystery of UFOs*, Thomas Bullard suggests that this may be more interesting than merely evidence of compulsive anthropocentrism and a limited imagination. Surely, we aren't really trying to grasp the actuality of extra-terrestrials. Or at any rate, the narratives related by believers in and experiencers of UFOs, aliens among us and extra-terrestrial abductions tell us as much about human fears (and hopes) as about the real or fancied activities of visitors from outer space. Bullard is a board member of the Center for UFO Studies (CUFOS), a privately funded research group set up in 1973 to make UFO studies more academically respectable – 'the flagship of scholarly excellence for the field'. CUFOS was headed until his death in 1986 by Josef Allen Hynek, a professor of astronomy at Northwestern University and longtime consultant to the US air force. He publicly switched from doubter to believer in the fact, at least, of unidentified flying objects, having decided that in spite of all the false sightings there was 'a stubborn, unyielding residue of incredible reports from credible people'. Bullard echoes Hynek in holding that 'the body of data points to an aspect of the natural world not yet explored by science' and goes further, to say 'that enough threads of coherent experience exist to reject cultural explanations as less than the whole story, though cultural influences contribute much to our interest in the phenomenon even as they do much to confuse our understanding of it. Both sides deserve the serious attention they have never received.'

He describes numerous classical UFO sightings and abduction claims, allowing that many of them were fake or misinterpretations of astronomical or covert military phenomena. Those that remain come from reliable sources, lack alternative explanations, or have a compelling cross-cultural and historical consistency. He says no more than that some stories can't be accounted for by other explanations. This makes him a surprisingly restrained advocate of little green men. His background is in folklore – his PhD from Indiana University was on that subject – and it inclines him to give far greater cultural and anthropological weight to his understanding of sightings and experiences of the phenomenon of UFOs than you'd otherwise expect. In a subject where the lack of non-anecdotal evidence means it is only possible to believe in extra-terrestrial visits, not to prove them, a cultural description is probably the only alternative to evangelical sermonising. Evangelism works wackily both ways: in 1997, Pat Robertson called for people who believe in 'space aliens' to be stoned to death, since if 'space aliens' did exist they (and therefore believers in them) would be nothing more than agents of the devil trying to lead people away from Christ.

Stories of sightings and meetings with aliens take up a good deal of *The Myth and Mystery of UFOs*, and are familiar from science fiction in all its forms as well as reports in newspapers. The mother of all sightings is centred on Roswell in New Mexico, where in 1947 (and as it happens, in the week I was born – just saying) debris was found which was, according to taste, the remains of a crashed UFO or of a military weather balloon from a secret spy programme called Project Mogul. Rumours that dead aliens were found with the debris and hidden in Area 51, a top secret military base in Nevada, were kept alive by a scratchy film that emerged in 1995, showing a large-headed, bug-eyed alien corpse being dissected on an operating table by a man in a white coat. In 2006, the film was revealed by its maker to have been a hoax, but Roswell was the





first of a slew of mid-20th-century sightings which supplied the prototype of the conspiracy theory that still circulates among believers. At its most vivid, the story is that the US government made contact with aliens decades ago and formed a secret world government in alliance with them, keeping the masses ignorant and themselves in power. They deliberately mock or ignore believers in UFOs, who are something like seers or liberationists in the face of devilish or imperialist forces of oppression. *Close Encounters of the Third Kind* fed alluringly off this theory. To more sceptical but still paranoid observers, UFOs at their most plausible are indeed unidentified flying objects: secret military hardware mistaken for something otherworldly. The world government story remains, but the threat is earthly and the solution individual survivalism or Tea Parties. At their most useful as propaganda at the height of the Cold War, evil, non-individualist aliens in American movies and on the radio regularly threatened the earth with obliteration, and with much more determination and animus than Nikita Khrushchev banging his shoe on the desk at the UN.

However, it is Bullard's account of the myth, rather than the mystery, that offers the most acceptable account of alien sightings and abductions. Or at any rate the most familiar and easiest to take. Aliens who whisk innocent sleepers off to their spaceships and give them medical examinations or impregnate them are only doing what fairies and hobgoblins have been doing since long ago and far away. Perfectly ordinary people in folk stories the world over are regularly stopped on the road and taken away by mischievous or sinister Others. In Western European culture, mermaids drag sailors to the depths, Oberon and Puck do a number on Bottom, Rumpelstiltskin demands a human child of his own in return for a magical favour, the witch entices lost children into a gingerbread house, the inscrutable Pied Piper, dressed half in yellow and half in red, seduces away rats and then, when the citizens of Hamelin prove incorrigible, whisks off the younger generation. In the Bible there was a time when giants walked among us and sons of God or angels mated with fair-faced human females, or appeared to individuals to tell them that they were pregnant with a changeling, or to deliver a warning of things to come and save the world from itself. These stories of underground and parallel worlds have comforted or terrified human beings for centuries. Why wouldn't we include the space above our heads in our narratives, and why wouldn't we update the stories? Bullard describes a Zimbabwean sighting at Mutare in 1981. A brightly lit sphere was seen by 20 workers coming back from the fields. It rolled along the ground and then burst into flames. Clifford Muchena saw three men standing observing the fire. They were 'tall and luminous, they wore silver suits, and a power from them caused him to fall to the ground.' He told the investigator, Cynthia Hind, that they were the spirits of his ancestors. She pointed out that his ancestors would 'wear hides and crocodile teeth instead of silvery suits', to which Muchena replied: 'Yes, but times change!' Investigators have cultural limitations as well as witnesses.

Bullard is doing cultural anthropology of a more functional kind, but it's an effective way of analysing vast amounts of annoying and otherwise unrepresentable data. Conversely, the old stories can be reinterpreted from a modern ufologist's point of view as alien sightings which a non-technological world used its own cultural assumptions to describe. Aliens interfere in very similar ways, dangerous, powerful but compelling. They aren't angels, but visitors from far-off planets, not ancient questing heroes but high-tech travellers from unimaginable distances. Or they are embedded in the mysteries of the planet so that wonders of ancient architecture and earthworks – Egyptian pyramids, Easter Island sculptures, the Nazca Lines in Peru – are to be taken as evidence of advanced alien technologies fallen into disrepair. They've already been and gone. Did they give up on us or were they only passing through and planting a little alien know-how for their own comfort? Anything incomprehensible is available to be either a sign from God or evidence of an extra-terrestrial visitation. Sleep paralysis is used to explain the helplessness of physical abduction experiences, but believers' stories of what ufologists call 'high strangeness' are so compelling that it's a pity to insist on a terrestrial physicalist explanation.

Either to give his book a what-the-hell pro-believer kick in the tail that non-believers can at least smile at, or because the silliness of the example is so great that it can't be fantasy, Bullard, the anti-sceptical sceptical director of CUFOs, offers as the most convincing case for the existence of alien visitations the account of an alien raccoon giving the nod to the Nobel laureate Kary Mullis. In his final chapter, Bullard tells of Mullis arriving after midnight (having 'passed the functional sobriety test': he'd driven 'successfully through the mountains') at his cabin in the woods of northern California in 1985.





Once he turned on the lights and left sacks of groceries on the floor, he lighted his path to the outhouse with a flashlight. On the way, he saw something glowing under a fir tree. Shining the flashlight on this glow, it seemed to be a raccoon with little black eyes. The raccoon spoke, saying, 'Good evening, doctor,' and he replied with a hello.

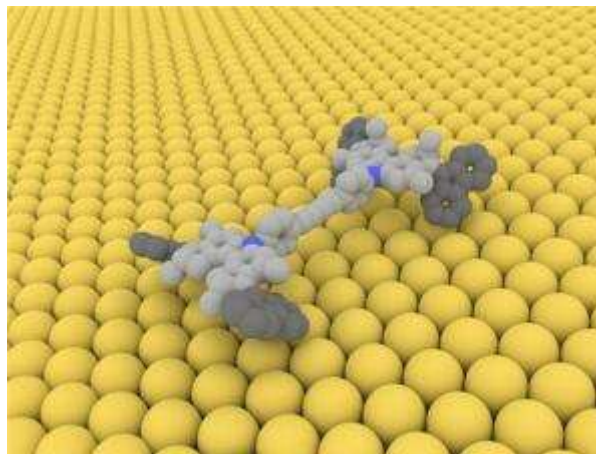
You will have read more than a couple of folk and fairy stories that start like this, to say nothing of *Alice in Wonderland*, the raccoon being a geographically specific protagonist rather than a white rabbit, a woman of the *sidhe* from Eire, a biblical angel or a swan formerly known as Zeus, so you won't be more surprised by the encounter than Mullis seemed to be. Yet for all his clarity about the way alien encounters mesh tightly with older and more terrestrial human legends (those other kinds of Other), Bullard thinks that this is the hardest story to deny. Mullis himself later came across Whitley Strieber's huge-selling book about his own alien abduction, *Communion*, and recognised the time he lost that night, but as a chemist couldn't quite bring himself to accept that he'd been abducted by aliens. Why would they pretend to be a talking raccoon, and anyway, if they're so smart, how come they invariably have to stick probes up abductees' bottoms to see what we're made of? On *Star Trek* didn't they have a little gadget that you popped into an alien's ear and it told you instantly what kind of life form it was? In fact, I think I've seen very similar machines used in present-day Las Vegas at the CSI laboratories. So holding back on a definitive yes to alien visitation, Mullis speculated instead that the raccoon 'was some sort of holographic projection and ... that multidimensional physics on a macroscopic scale may be responsible'. And, getting out my Occam's razor, I too am inclined to prefer the little green talking raccoon from outer space as the more plausible explanation. Bullard's point is that here is a highly respected scientist who is adamant that something perfectly ridiculous actually happened to him. Mullis, in his autobiography *Dancing Naked in the Mind Field*, insisted: 'To say it was aliens is to assume a lot. But to say it was weird is to understate it ... It's what science calls anecdotal, because it only happened in a way that you can't reproduce. But it happened.'

Believers in all manner of paranormal phenomena regularly argue that science can't effectively test or falsify such experiences, precisely because it's normal science. This argument doesn't help their case among sceptical scientists, but normal science ought to know by now that almost everything has at one time been beyond its capacity to test. Maybe it takes a Nobel Prize-winning scientist to come up with the phrase 'But it happened.'

<http://www.lrb.co.uk/v33/n22/jenny-diski/what-might-they-want>



Nano Car Has Molecular 4-Wheel Drive: Smallest Electric Car in the World



Measuring approximately 4x2 nanometres the molecular car is forging ahead on a copper surface on four electrically driven wheels. (Credit: Image courtesy of Empa)

ScienceDaily (Nov. 10, 2011) — Reduced to the max: the emission-free, noiseless 4-wheel drive car, jointly developed by Empa researchers and their Dutch colleagues, represents lightweight construction at its most extreme. The nano car consists of just a single molecule and travels on four electrically-driven wheels in an almost straight line over a copper surface. The "prototype" can be admired on the cover of the latest edition of *Nature*.

To carry out mechanical work, one usually turns to engines, which transform chemical, thermal or electrical energy into kinetic energy in order to, say, transport goods from A to B. Nature does the same thing; in cells, so-called motor proteins -- such as kinesin and the muscle protein actin -- carry out this task. Usually they glide along other proteins, similar to a train on rails, and in the process "burn" ATP (adenosine triphosphate), the chemical fuel, so to speak, of the living world.

A number of chemists aim to use similar principles and concepts to design molecular transport machines, which could then carry out specific tasks on the nano scale. According to an article in the latest edition of science magazine "Nature," scientists at the University of Groningen and at Empa have successfully taken "a decisive step on the road to artificial nano-scale transport systems." They have synthesised a molecule from four rotating motor units, i.e. wheels, which can travel straight ahead in a controlled manner. "To do this, our car needs neither rails nor petrol; it runs on electricity. It must be the smallest electric car in the world -- and it even comes with 4-wheel drive" comments Empa researcher Karl-Heinz Ernst.

Range per tank of fuel: still room for improvement

The downside: the small car, which measures approximately 4x2 nanometres -- about one billion times smaller than a VW Golf -- needs to be refuelled with electricity after every half revolution of the wheels -- via the tip of a scanning tunnelling microscope (STM). Furthermore, due to their molecular design, the wheels can only turn in one direction. "In other words: there's no reverse gear," says Ernst, who is also a professor at the University of Zurich, laconically.

According to its "construction plan" the drive of the complex organic molecule functions as follows: after sublimating it onto a copper surface and positioning an STM tip over it leaving a reasonable gap, Ernst's colleague, Manfred Parschau, applied a voltage of at least 500 mV. Now electrons should "tunnel" through the molecule, thereby triggering reversible structural changes in each of the four motor units. It begins with a



cis-trans isomerisation taking place at a double bond, a kind of rearrangement -- in an extremely unfavourable position in spatial terms, though, in which large side groups fight for space. As a result, the two side groups tilt to get past each other and end up back in their energetically more favourable original position -- the wheel has completed a half turn. If all four wheels turn at the same time, the car should travel forwards. At least, according to theory based on the molecular structure.

To drive or not to drive -- a simple question of orientation

And this is what Ernst and Parschau observed: after ten STM stimulations, the molecule had moved six nanometres forwards -- in a more or less straight line. "The deviations from the predicted trajectory result from the fact that it is not at all a trivial matter to stimulate all four motor units at the same time," explains "test driver" Ernst.

Another experiment showed that the molecule really does behave as predicted. A part of the molecule can rotate freely around the central axis, a C-C single bond -- the chassis of the car, so to speak. It can therefore "land" on the copper surface in two different orientations: in the right one, in which all four wheels turn in the same direction, and in the wrong one, in which the rear axle wheels turn forwards but the front ones turn backwards -- upon excitation the car remains at a standstill. Ernst und Parschau were able to observe this, too, with the STM.

Therefore, the researchers have achieved their first objective, a "proof of concept," i.e. they have been able to demonstrate that individual molecules can absorb external electrical energy and transform it into targeted motion. The next step envisioned by Ernst and his colleagues is to develop molecules that can be driven by light, perhaps in the form of UV lasers.

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<http://www.sciencedaily.com/releases/2011/11/111110092403.htm>





My Egyptian Cousin

Jonathan Lethem

I have never travelled further from New York than Western Europe; Saad Eddin Ibrahim is an advocate of democracy imprisoned in Egypt. But Saad and I are both outlying members of the same sprawling Midwestern family: Saad is married to my first cousin Barbara. His name is much in the news and on the op-ed pages these days, if you're looking out for it. A year ago, the *New York Times Magazine* ran a photo of Saad on its cover, in which he is seen peering from between his courtroom cage-bars. But even such prominent items can be lost in the dispiriting muddle of Middle Eastern politics, so hard to keep in view amid yellow-alert warnings of poison-gas attacks, or alongside sniper headlines which further convince our fear-stupefied Western selves that anyone called Muhammad has a predisposition to run amok.

Saad is a professor of sociology at the American University in Cairo and the founder and director of the Ibn Khaldoun Centre for Development Studies, which campaigns for a secular and democratic civil society in Egypt. Famous in Egypt for his controversial writing on minorities, and for his role as a Presidential adviser and television commentator in the Sadat years, Saad came increasingly under attack in the official press during the Mubarak era.

His defence of the persecuted Coptic Christians and his criticism of electoral corruption was, it seemed, tolerated because of his closeness to the Mubarak family – the President's wife and sons had been among his students. But Saad, like Falstaff, may have known his President too well and not well enough. When he publicly warned against the possibility of Mubarak grooming one of his sons to succeed him, he was arrested, as an object-lesson to other would-be activists. Mubarak perhaps did not so much initiate this action as withdraw his protection, allowing reactionary elements, who had long been calling for Saad Eddin Ibrahim to be silenced, to do as they wished.

In July 2000, after raids on his home and on the Ibn Khaldoun Centre, Saad and 27 of his students and colleagues were charged with accepting foreign funds for the purpose of defaming Egyptian society in a documentary film and a paper on election-rigging. The EU, which supplied the funds in question, has since endorsed their use in four separate affidavits. The laws under which Saad was prosecuted were framed in an attempt to stem the flow of funds for subversive Islamist activities. He was tried before a special court set up after Sadat's assassination to deal with terrorists, but which is increasingly used to persecute homosexuals, members of religious minorities, and advocates of free speech. My cousin Barbara described the courtroom in a letter to me:

The scene can only be experienced, it is nearly impossible to describe: throngs of reporters blocking the line of vision between lawyers and the bench, cell phones going off every two minutes, lawyers dressed in 'robes' that once were styled on British barristers', but now a tradition so long forgotten that glued-on cotton balls stand in for ermine ruffs. Janitors shuffle around in plastic flip-flops among years of cigarette butts asking us for backsheesh – during the proceedings – for 'cleaning' the room. The defendants stand in an iron cage for the duration of the hearings, but the grill is so broken down that we can pass notes and coffee in to Saad at any time.

Five of Saad's students and colleagues were convicted along with him; most have now been freed having served nine months. Saad's captivity, though, still serves a purpose. I have tried to understand it this way: imagine that the President of the United States, rather than ignoring the bee-stings of a dissident leftist – Noam Chomsky, say, or Ralph Nader, perhaps Michael Moore – had had him imprisoned. Astonishment would quickly give way to fear of speaking out. The incarceration of one person, the right person, can be an act of the most ruthless efficiency, chaotic kangaroo-court tableaux notwithstanding. So Saad, a 67-year-old scholar in failing health, faces six more years of imprisonment. An appeal hearing this month appears to be his last hope (short of a Mubarak pardon) of being spared.





My cousin Barbara spent her childhood in the Chicago suburb of Palatine, and met Saad in 1967 when she was his student at DePauw University in Indiana; they were married in 1971 and moved to Cairo, where their two children grew up and where she is a director of research with the International Population Council. Her father – and mine – grew up on farms in Iowa and Missouri: our grandfather was a travelling salesman who dealt in farm equipment and supplies. That she was able to make such a move may have something to do with the 1960s. Among the many international groups to send representatives to Washington DC on 25 October for a Free Saad Eddin Ibrahim rally was the Duck, a group of Saad's former students and colleagues from DePauw, named for the Fluttering Duck – a, yes, coffeehouse, at the corner of Center Street and Vine in Greencastle, Indiana, where the lecturer and his Midwestern acolytes used to hang out. In a recent e-mail circular, the Duck reminded members to send notes of protest to the Egyptian Embassy, in order to help the Ibrahim family 'to keep on keeping on'.

I first met Saad some time in the 1960s, when I was five or six years old. I clearly remember him visiting our house in Brooklyn as early as 1971, and then more clearly still at Lethem family reunions held at various sites in Kansas, Arkansas and Missouri on through the 1970s. I understood his place in my life, and in my family, through a lens of '1960s consciousness' inherited from my parents. This inheritance was effortless and, until quite recently, relatively unexamined. My mother was New York Jewish, and, behind that, a mix of High-German-assimilated and Polish-Russian shtetl; my father was Midwestern-Protestant-nothing, with distant Scots-English roots, and by the 1970s had become a practising Quaker, partly in protest against the Vietnam War. The real religion in our house, though, was a combination of art and protest and utopian internationalist sentiment. Through the Friends Service Committee and through our connection with the *Guardian*, a Communist newspaper, our family took in lodgers from all over the world – I remember particularly a Rwandan Tutsi and an Okinawan. Inter-marriage, of any sort, was felt to be heroic, and Barbara, with her Egyptian family, seemed absolutely heroic. So did my fabled Aunt Molly, the dark horse of my mother's family, who'd fled New York and married a Mexican, and then set up as a folk artist in Arizona. Even the Midwestern Lethems were obsessed with their purported trace of Native American blood – my legendary great-great-grandfather, named Brown, is said to have taken an Oglala Sioux bride.

Also, I grew up in a Brooklyn neighbourhood with more brown faces than white. So it was thrilling and consoling – not only righteous but intuitively right – that splashing around alongside us paler kids in the motel pool in Maryville, Missouri, during those 1970s family reunions, were my dark Egyptian cousins, Randa and Amir. And, by the poolside, arguing politics with my World War Two veteran uncles, and with my outspoken radical Jewish mother, was their growly, bearded, imperious and quite lovable father, Saad. In fact, though we might by some current standards seem conceptually 'opposed', we half-Jewish and half-Egyptian cousins were more like each other than we were like the many dozens of pure Midwestern cousins surrounding us. We'd brought a new flavour to the Lethem family, a scent of the wider world, of cosmopolitan cities and oceans, to a landlocked tribe. Though in New York City I made a very unconvincing Jew to other Jews – unobservant, un-Bar Mitzvah'd, attending Quaker Sunday school – in Kansas I was hot currency. One of my cousins once walked me down a suburban street in Overland Park, Kansas in order to show me off, though that was a mission of mercy: there was an adopted Jewish kid on the street, shy and ashamed at being the only Jew anyone in the neighbourhood knew. He was perhaps seven or eight years old. I was proof that a kid like him could turn into a normal teenager: see, Jews are okay! Even Chris Lethem's got one in his family!

I felt I was a token of a world improved by mongrelisation. I was by that time enamoured of Arthur C. Clarke, whose Stapledonian socialism thrummed just under the surface of his glossy futures. 'We must not export our borders into space,' he said. Those visions seemed to me then an obvious extension of my parents' hippy values. I remember once disconcerting my father by explaining, with the patronising certainty of an adolescent lecturing an adult, that the chimera of nationalism would dissolve into a single planetary government within my lifetime, if not his. We were all going to intermarry and brownify and hold hands and honour our essential human cousinhood – weren't we?





Well, 2001 wasn't Clarke's year. I remember sitting with Saad 15 years earlier, watching the 1976 Olympics on a Missouri motel-room television. If at that time he had any inkling that the Islamist Right, soon to slaughter Sadat, or the Reagan Right, soon to slaughter FDR's and my parents' hopes for American society, were together going to keep the Fluttering Ducks among us in abeyance for another millennium or so, he didn't say anything to damage my own hopefulness. Certainly, his outlook must have been more realistic than mine, or even my parents'. Still, it's unlikely he could have imagined the degree of slippage in his own culture – the extent to which the educated urban middle classes to which he and his students belong would be squeezed on either side by Islamic activism and what he has called the 'Oriental despotism' of the 'pharaonic' Mubarak regime.

In the immediate aftermath of the New York attacks Saad wrote a new postscript for the reissue of *Egypt, Islam and Democracy*.^[*] Writing from his jail cell, he reminded us that, for Egyptians, 11 September has a very relevant (if somewhat smaller) local precursor, one rarely mentioned in American discussions of the World Trade Center disaster – the attacks at the Temple of Luxor in 1997, in which Islamist militants killed sixty tourists, mostly Swiss, British and Japanese, as well as a number of Egyptian guides. Saad describes what happened at Luxor as 'the bitter harvest of the last decade'. 'It was like an earthquake: it was swift and devastating at the epicentre, but its economic and political aftershocks were longer and more pervasive.' The terrorists 'exposed the vulnerability of the state, the fragility of the economy and the soft underbelly of society'. As New Yorkers must fear al-Qaida living next door, so must Egyptians. It isn't only the Lethems who would, given the chance, sooner be sunning themselves at a motel poolside.

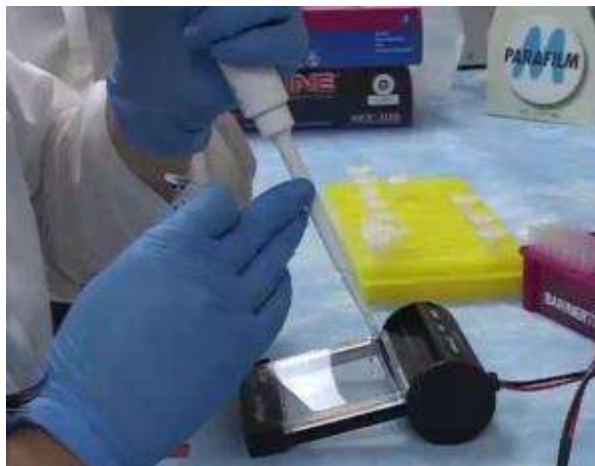
[*] AUC Press, 278 pp., \$19.95, 1 May, 9 77424 664 0.

[*] AUC Press, 278 pp., \$19.95, 1 May, 9 77424 664 0.

<http://www.lrb.co.uk/v24/n24/jonathan-lethem/my-egyptian-cousin>



Obese Monkeys Lose Weight On Drug That Attacks Blood Supply of Fat Cells



An anti-obesity drug that homes in on and destroys blood vessels that support fat reduced the weight of obese rhesus monkeys by 11 percent in one month. (Credit: Image courtesy of University of Texas M. D. Anderson Cancer Center)

ScienceDaily (Nov. 9, 2011) — Obese rhesus monkeys lost on average 11 percent of their body weight after four weeks of treatment with an experimental drug that selectively destroys the blood supply of fat tissue, a research team led by scientists at The University of Texas MD Anderson Cancer Center reports in *Science Translational Medicine*.

Body mass index (BMI) and abdominal circumference (waistline) also were reduced, while all three measures were unchanged in untreated control monkeys. Imaging studies also showed a substantial decrease in body fat among treated animals.

"Development of this compound for human use would provide a non-surgical way to actually reduce accumulated white fat, in contrast to current weight-loss drugs that attempt to control appetite or prevent absorption of dietary fat," said co-senior author Renata Pasqualini, Ph.D., professor in MD Anderson's David H. Koch Center for Applied Research of Genitourinary Cancers.

Previous attempts to treat obesity have predominantly focused on drugs aimed at suppressing appetite or increasing metabolism, the researchers noted, but these efforts have been hampered by their toxic side-effects. The MD Anderson group designed a new drug, which includes a homing agent that binds to a protein on the surface of fat-supporting blood vessels and a synthetic peptide that triggers cell death. Their blood supply gone, fat cells are reabsorbed and metabolized.

"Obesity is a major risk factor for developing cancer, roughly the equivalent of tobacco use, and both are potentially reversible" said co-senior author Wadih Arap, M.D., Ph.D., also professor in the Koch Center. "Obese cancer patients do worse in surgery, with radiation or on chemotherapy -- worse by any measure."

Monkeys are spontaneously obese In earlier preclinical research, obese mice lost about 30 percent of their body weight with the drug, now called Adipotide. The drug acts on white adipose tissue, the scientific name for the unhealthy type of fat that accumulates under the skin and around the abdomen, and is a disease and mortality predictor.

"Most drugs against obesity fail in transition between rodents and primates," Pasqualini said. "All rodent models of obesity are faulty because their metabolism and central nervous system control of appetite and

satiety are very different from primates, including humans. We're greatly encouraged to see substantial weight loss in a primate model of obesity that closely matches the human condition."

The rhesus monkeys in the current study were "spontaneously" obese, said study first author Kirstin Barnhart, D.V.M, Ph.D., a veterinary clinical pathologist at MD Anderson's Keeling Center for Comparative Medicine and Research in Bastrop, Texas. No specific actions were taken to make them overweight; they became so by overeating the same foods provided to other monkeys in the colony and avoiding physical activity.

The wider problems of obesity This primate model also shares other physiological features associated with human obesity, such as metabolic syndrome, characterized by an increased resistance to insulin, which can lead to the development of type 2 diabetes and cardiovascular disease. Adipotide-treated monkeys showed marked improvements in insulin resistance -- using about 50 percent less insulin after treatment.

Arap, Pasqualini and colleagues are preparing for a clinical trial in which obese prostate cancer patients would receive daily injections of Adipotide for 28 consecutive days. "The question is, will their prostate cancer become better if we can reduce their body weight and the associated health risks," Arap said.

Some prostate cancer treatments, such as hormone therapy, cause weight gain. Greater weight can lead to arthritis, which in turn causes inactivity that leads to more weight gain, a cascade effect of co-morbidities, Arap said. Fat cells also secrete growth hormones that cancer cells thrive upon.

Overall and abdominal body fat levels drop, with reversible renal side effects Weight, BMI and abdominal circumference all continued to drop for three weeks after treatment ended before slowly beginning to reverse during the fourth week of the follow-up period.

Magnetic Resonance Imaging (MRI) was used to gauge abdominal body fat, thought to be the most dangerous area for humans to gain weight in terms of raising disease risk. Treated monkeys' abdominal fat levels fell by 27 percent during the study. Fat levels increased slightly in the control group.

Lean monkeys did not lose weight in a separate study to test for potential effects of the drug in non-obese animals, indicating that the drug's effect may be selective for obese subjects.

Monkeys in the studies remained bright and alert throughout, interacting with caretakers and demonstrating no signs of nausea or food avoidance. This is a potentially important finding since unpleasant side-effects have limited the use of approved drugs that reduce fat absorption in the intestines.

The principal side effects were noted in the kidneys. "The renal effect was dose-dependent, predictable and reversible," Barnhart noted.

Second drug developed via vascular ZIP codes This study is the second drug developed using a vascular mapping technique created by the Arap-Pasqualini lab. Blood vessels, they found, are more than a uniform and ubiquitous "pipeline" that serves the circulatory system, but differ depending on the organ or tissue that they support.

They have developed a way of screening peptides -- small bits of proteins -- to identify those that bind to specific vascular cells among the many possible "ZIP codes" present in a human vascular map. For blood vessels that support fat cells, the target protein is prohibitin, which they found in unusual abundance on the blood vessel cell surface.

"The same delivery system used in mice and monkeys was recently validated in human white fat, as reported recently by our group," Arap said.



An earlier drug, which uses a different molecular address to target the blood supply of prostate cancer, has been evaluated in a first-in-man clinical trial, just completed at MD Anderson. MD Anderson and some of its researchers, including Arap and Pasqualini, have equity positions in drug-development companies Alvos Therapeutics and Ablaris Therapeutics, which are subjected to certain restrictions under institutional policy. MD Anderson manages and monitors the terms of these arrangements in accordance with its conflict-of-interest policy.

This research was funded by grants from the National Institutes of Health, the National Cancer Institute, AngelWorks, the Gillson-Longenbaugh Foundation, the Kleberg Foundation, the Marcus Foundation and the Prostate Cancer Foundation. 11/9/11

Story Source:

The above story is reprinted from materials provided by **University of Texas M. D. Anderson Cancer Center**.

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<http://www.sciencedaily.com/releases/2011/11/111109143009.htm>



Big Bang Theory fuels physics boom

Interest in A-level and university courses rises as US comedy makes the subject "cool"

- Mark Townsend
- The Observer, Sunday 6 November 2011



The Big Bang Theory attracted more than 500,000 viewers on its return to Channel 4. Photograph: Channel 4

A cult US sitcom has emerged as the latest factor behind a remarkable resurgence of physics among A-level and university students.

The Big Bang Theory, a California-based comedy that follows two young physicists, is being credited with consolidating the growing appetite among teenagers for the once unfashionable subject of physics. Documentaries by Brian Cox have previously been mentioned as galvanising interest in the subject.

One pupil, Tom Whitmore, 15, from Brighton, acknowledged that *Big Bang Theory* had contributed to his decision, with a number of classmates, to consider physics at A-level, and in causing the subject to be regarded as "cool". "*The Big Bang Theory* is a great show and it's definitely made physics more popular. And disputes between classmates now have a new way of being settled: with a game of rock, paper, scissors, lizard, Spock," he said.

Experts at the Institute of Physics (IoP) also believe the series is playing a role in increasing the number of physics students. Its spokesman, Joe Winters, said: "The rise in popularity of physics appears to be due to a range of factors, including Brian's public success, the might of the Large Hadron Collider and, we're sure, the popularity of shows like *The Big Bang Theory*."

Alex Cheung, editor of physics.org, said: "There's no doubt that TV has also played a role. *The Big Bang Theory* seems to have had a positive effect and the viewing figures for Brian Cox's series suggest that millions



of people in the UK are happy to welcome a physics professor, with a tutorial plan in hand, into their sitting room on a Sunday evening."

According to the Higher Education Funding Council for England (HEFCE), there was a 10% increase in the number of students accepted to read physics by the university admissions services between 2008-09, when *The Big Bang Theory* was first broadcast in the UK, and 2010-11. Numbers currently stand at 3,672. Applications for physics courses at university are also up more than 17% on last year. Philip Walker, an HEFCE spokesman, said the recent spate of popular television services had been influential but was hard to quantify.

The number studying A-level physics has been on the rise for five years, up 20% in that time to around 32,860. Physics is among the top 10 most popular A-level topics for the first time since 2002 – and the government's target of 35,000 students entering physics A-level by 2014 seems likely to be hit ahead of schedule. It is a far cry from 2005 when physics was officially classified as a "vulnerable" subject.

The number of those entered for AS level has also increased, by 27.8% compared with 2009, up from 41,955 to 58,190. The number of girls studying physics AS-level has risen a quarter to 13,540 and of boys by 28.6% to 44,650.

A Twitter debate on whether *Big Bang Theory* had played a role in encouraging more potential physicists provoked mixed reactions. PhD student Tim Green wrote: "I'd say it's more to do with economics and good science docs than sitcoms with only the vaguest relation to physics." Markela Zeneli said: "I think the show is hilarious, and it may make physicists seem nerdy and geeky, but what's so bad about that? "

Winters identified another more prosaic reason for the rising popularity of physics. He said: "TV shows and news coverage of exciting research both have the power to inspire their audiences but we firmly believe, and all the evidence suggests, that only good physics teaching has the power to convert student's latent interest into action."

<http://www.guardian.co.uk/education/2011/nov/06/big-bang-theory-physics-boom>





America and Libya

Edward Said

In the extracts from David Stockman's memoirs published on Monday 14 April by *Newsweek*, Reagan's former Budget Director spoke of the mediocrities, charlatans and power-hungry politicians who cluster around the disturbingly vague and incompetent Great Communicator. For them, Stockman said, 'reality-time' was the seven o'clock evening news on television. How did we look and sound? they ask themselves, as if public policy were some sort of show designed to entertain and please 'the American people' once a day, five nights a week. On 14 April reality-time began on each of the three networks with the same first indications of an American strike against Libya.

In New York, I watch Peter Jennings on ABC largely as a matter of habit, although the other anchormen seem to produce roughly the same results. Jennings opened by announcing that something was happening in Tripoli; then he passed things over to two correspondents there who, from their hotel window, reported artillery and bomb blasts that shook the building. Jennings came back on to announce a briefing by Larry Speakes, the White House press spokesman; back to Tripoli for the end of the raid (it was now 7:10 or so), a couple of commercials, and then down to Speakes in Washington. He read a prepared statement with his customary virtuosity, stumbling over nearly every syllable and yet inflecting his sentences with what in this B-grade-Hollywood Administration passes for righteous seriousness.

Except for two details, it is difficult to imagine how this well-packaged 30 minutes of national television differs from the way a state broadcasting system would handle an attack on a weak country somewhere 'out there'. One point is that the programme was done three times simultaneously instead of once: the unanimity of the networks was perfect. Another is that the show-business co-ordination of getting the raid onto the evening news, with appropriate preparation, commentary and summary, keeping it there for 30 minutes including commercials, was an example of how private enterprise and government can work together with remarkable, apparently unrehearsed agility. It was spontaneous, it was well-synchronised, it was, as they say, 100 per cent effective, and for days afterwards the networks ran advertisements in the papers claiming eminence and victory for their 'version' of the same theatrical event. At 7:01 on 14 April NBC was first, said one ad.

I have never seen anything like it, this display of capsule theatricality, manipulation, violence and unadulterated patriotism, and it still goes on. Whole supplements have appeared in each of the major dailies, printing millions of words, all of them repeating more or less the same details, the same jargon about surgical strikes, collateral damage, terrorist planning and command centres. Every national and local news-and-discussion show has scheduled literally hundreds of hours of analysis: the President, Secretaries Shultz and Weinberger, General Vernon Walters, various 'experts' – on terrorism, counter-terrorism, the Middle East, Europe, the universe – have appeared along with a tiny handful representing 'the other side', interspersed with the same Libyan scenes, the same European demonstrations, the same stirring file pictures of American bombers and battleships, the same senators, Pentagon and State Department spokesmen, the same man-in-the-street interviews extolling 'our' side with the same, exactly the same, enthusiasm. We had to do it, ran the standard printable message, or, said the *New York Times*, we were 'seeing justice done'. Kicking Libyan (i.e. nigger) ass, and feeling good about it, was the unspoken message.

<http://www.lrb.co.uk/v08/n08/edward-said/america-and-libya>



Value of degrees to be revealed for first time

Students will be able to find out which universities lead to the best jobs and the highest lifetime earnings in new data to be collected for the first time.



The information will be vital to students who face paying £27,000 for a three year degree and years of debt when they start work Photo: PA



By Julie Henry, Education Correspondent

7:00AM GMT 06 Nov 2011

Official work force surveys are to quiz respondents about which universities they attended, revealing which institutions are most and least successful at producing graduates who go on to certain careers.

The information will be vital to students who face paying £27,000 for a three year degree and years of debt when they start work.

It is part of a move by ministers to make higher education more accountable and reveal key details about what undergraduates get for their money.

The data will be collected by the Office for National Statistics as part of the Labour Force Survey (LFS), which questions 110,000 people in 50,000 households at quarterly intervals and is used to show national employment levels.



The survey already asks respondents about their qualifications but it will now publish information on what universities they attended.

As a results, it will be possible to show which university graduates dominate lucrative careers like law and banking, where the highest paid and lowest paid went to university and the financial benefits over time of attending particular institutions.

It comes in addition to 15 key pieces of information that will be published next year to help students select courses, including the proportion of students who are employed sixth months and three years after they graduate and the level of work they are doing.

A Government source said: "Some of the best universities like Oxford and Cambridge can do quite poorly on measures tracking students straight after graduation because a lot of students go on to postgraduate study before work.

"The labour force survey gives details of salaries and employment over time, which students can make judgements on.

"Over time the LFS information could enable modelling of lifetime earnings by institution and help contribute to our understanding of social mobility."

Last month, *Which?* magazine revealed plans to launch an online guide for students showing which degrees provide the best value for money.

The consumer champion will use the information from universities including students views on course content and teaching quality, details about contact hours and exams, as well as access to facilities like libraries, laboratories and information technology.

David Willetts, the university minister, said: "We hope independent organisations like *Which?* and the website Student Room will present this new information in innovative ways so that no one is left in the dark when deciding where to apply."

University applications for 2012 – the first year of higher tuition fees – are running at 9 per cent below last year's level, according to figures released last month.

When overseas applications are taken out, the figures show a 12% drop in applications from UK students.

Universities UK cautioned that the final application deadline is not until January and that the figures were "unreliable indicators".

<http://www.telegraph.co.uk/education/universityeducation/8872154/Value-of-degrees-to-be-revealed-for-first-time.html>



Biologists Slow the Aging Process in Fruit Flies: Study Has Implications for Humans



Fruit fly (*Drosophila melanogaster*). (Credit: © Studiotouch / Fotolia)

ScienceDaily (Nov. 9, 2011) — UCLA life scientists have identified a gene that slows the aging process. The biologists, working with fruit flies, activated a gene called PGC-1, which increases the activity of mitochondria, the tiny power generators in cells that control cell growth and tell cells when to live and die.

"We took this gene and boosted its activity in different cells and tissues of the fly and asked whether this impacts the aging process," said David Walker, an assistant professor of integrative biology and physiology at UCLA and a senior author of the study. "We discovered that when we boost PGC-1 within the fly's digestive tract, the fly lives significantly longer. We also studied neurons, muscle and other tissue types and did not find life extension; this is telling us there is something important about the digestive tract."

The research appears in the current online edition of *Cell Metabolism*, the leading journal in its field, and will be published in an upcoming print edition. Co-authors are from Walker's laboratory, the Salk Institute for Biological Studies in La Jolla, Calif., and the department of biology at UC San Diego.

"By activating this one gene in this one tissue -- the intestine -- the fly lives longer; we slow aging of the intestine, and that has a positive effect on the whole animal," said Walker, a member of UCLA's Molecular Biology Institute. "Our study shows that increasing PGC-1 gene activity in the intestine can slow aging, both at the cellular level and at the level of the whole animal."

The biologists delayed the aging of the flies' intestines and extended their lives by as much as 50 percent.

Fruit flies, or *Drosophila melanogaster*, have a life span of about two months. They start showing signs of aging after about one month, and they slow down, become less active and die, Walker said. They are a great model for studying aging, he said, because scientists know every one of their genes and can switch individual genes on and off.

What are the study's implications for human aging?

"We all think about protecting the brain and the heart, but the intestine is a vital tissue type for healthy aging," Walker said. "If anything goes wrong with the mitochondria in cells, the consequences could be devastating, and if anything goes wrong with our intestines, that may have devastating consequences for other tissue types and organs. Not only is the intestine essential for the uptake of nutrients that are a vital source of energy, but it



is also an important barrier that protects us from toxins and pathogens in the environment. The intestine has to be well-maintained.

"No one yet knows what causes aging at the cellular or tissue level," Walker said. "As we age, our mitochondria become less efficient and less active. That has far-reaching consequences, because if the mitochondria decline, then all of our cellular functions may be compromised. However, it's a dangerous road to travel to say, "This is the cause of aging."

The PGC-1 gene activates the cells' mitochondria and regulates mitochondrial activity in mammals and flies. The gene is a potential target for pharmaceuticals to combat age-related diseases, Walker said.

The study raises the question of whether increasing mitochondrial activity is an effective strategy to delay aging. If so, increasing the PGC-1 gene may prove key, Walker said.

The first question Walker and his colleagues asked was whether the fruit fly version of PGC-1 has the same function as the mammalian version. They found it does.

The biologist increased levels of expression of the fly version of the PGC-1 gene and found that this made mitochondria more active. They then tested whether boosting PGC-1 activity would slow aging and, again, they found that it did, when they focused on the fly's digestive tract.

The fly's intestine is maintained by adult stem cells, previous research has shown. The biologists also asked what would happen if they used genetic and molecular tools to boost PGC-1 gene expression within only the stem cells and their immediate "daughter" cells.

"Collaborating with a stem cell group at the Salk Institute for Biological Studies, we boosted the gene expression within just the stem- and the immediate daughter-cell types and found that was sufficient to extend the life span of the flies," said Walker, who studies the basic underlying mechanisms of the aging process.

In addition, increasing the fruit fly's version of PGC-1 delays the onset of cellular changes within the intestine, thereby establishing a link between mitochondria, tissue stem cells and aging, the new study shows.

"Many scientists study the diseases of aging, and they tend to do so individually," Walker said. "One group will study Alzheimer's disease, another group will study cardiovascular disease, another will study cancer. We take a different approach. We don't single out any of these specific diseases of old age. We study the aging process itself. Aging is the No. 1 risk factor for most cancers, heart disease, Alzheimer's disease, Parkinson's disease and many others."

Co-authors on the study included Michael Rera, a UCLA postdoctoral scholar in Walker's laboratory; Sepehr Bahadorani, a former postdoctoral scholar in Walker's laboratory; and Jaehyoung Cho, a former postdoctoral scholar in Walker's laboratory.

Walker's research was funded by the National Institutes of Health and the Ellison Medical Foundation. Walker is an Ellison Medical Foundation New Scholar in Aging.

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instant Mentor

Sympathy, Not Surrender

November 11, 2011 - 3:00am

By

Rob Weir

"There shall be weeping and gnashing of teeth..." Professors often feel like heralds of Biblical plagues when they hand back student papers. I recently distributed a batch of 32 research papers and the response was pretty much what it's been since I started teaching more than a quarter-century ago: one student dropped the course, several were upset, one was indignant, a half-dozen danced for joy, and the rest sauntered off without comment. At long last, I'm O.K. with that.

For years I was one of those humanists who envied professors on the quantitative side of things who had more precise grading measures of "right" and "wrong." Several times I tried to develop point scales for essays in order to make my qualitative grades appear more "objective." If you're contemplating such an idea, my advice is, don't go there! You're bound to come up with one of four systems: point allocations that take as long to calculate as it takes to read the essay; a reckoning so complex it confuses students; one that confuses you; or, some fatal combination of the first three. Make your peace with the salient reality that grading essays is a professional and qualitative judgment call on your part.

If you assign essays you should devise strategies to deal with the weepers and the gnashers – the ones who will show up at your office door. Rest assured that their very existence means you've probably done a pretty good job of grading. Universal happiness means that the assignment was too easy, or you've been way too lenient. (Universal outrage probably indicates the opposite!) I don't believe that grading has to look like the classic Bell Curve, but there should be a healthy distribution of grades. The university isn't a Lake Wobegone where every kid is "above average," even if your admissions office insists they are.

I'll deal with gnashers in a future piece, but for now let's consider the more common troubled student: the weeper. I highly recommend you adopt my policy of refusing to discuss individual student papers for at least 24 hours after handing them back. Weepers will want an immediate explanation for their grades, as well as detailed information on what they can do to recover from them. You should be kind and sympathetic, but schedule an appointment and be firm in your insistence that you will not discuss the paper until the student has looked over your comments and corrections. I go a step further and require students to come to my office with some notes and musings over where their papers strayed and how they can be improved. If a student shows up and clearly has done neither of these things, I (gently) send them that person away and schedule another appointment after reiterating that we need to identify specific problems before we talk about fixing them.

Some students will be emotional days later, no matter how much or how little they've thought about their papers. Professors wax rhapsodic about the life of the mind, the importance of being a lifelong learner, and of valuing the very "process" of education. These are important things, but we should also remember how driven some of our students are, as well as how young they are. We're right when we tell them that a C isn't the end of the world, but it will probably feel that way to them, especially when they're stuck inside their own emotions.

A well-stocked office should include a box of tissues, as at some point you will see waterworks displays. Offer words of comfort, but do not give in to tears. Sometimes this means telling students to take a short walk to compose themselves. Meaningful planning simply can't happen when the logic centers of the brain are disabled. Once the student is focused, engage in a dialogue – not a mini-lecture – on the paper's strengths and weaknesses. Lead with the positive before delving into bad news; it helps keep emotions in check. Try to get





the student to identify the problems. I can attest from years of experience that the issues you tell them to fix get addressed in a more perfunctory way than those that are self-revelations.

Never fall prey to the rookie mistake of raising a grade out of sympathy or a student's promise to do better. If your evaluation was fair in the first place, a student must earn a higher grade, not be granted one. This is where you have a big decision to make. Your choices boil down to allowing the grade to stand, recalculating your determination of the final grade, allowing the student to rework the assignment, offering extra credit, or working with the student on the next assignment.

The first is the easiest approach, though not necessarily the best. If we are true to our stated beliefs that one should learn from mistakes, then misfires should offer hope of redemption. But you must be careful. Does your syllabus – a contract between you and your students – state how the final course grade will be calculated? Unless you have stated wiggle room, you should not tell some students that their papers are worth 20 percent even though the syllabus says 30 percent. One way around this is to insert into your syllabus a phrase such as: "I reserve the right to modify (slightly) the above percentages to reward improvement over the course of the semester."

If you don't already have such a qualifier, you might wish to opt for the third or fourth option, if you can. This depends upon how many students and how much time you have. If you allow any one student to redo an assignment or complete an extra credit project, you must make this option available to all who ask. Don't be so naïve as to think you are making a special contract with just one or two students; word will soon get out and other students will approach you – especially at the end of the semester when some of your weaker students calculate their own class standing.

Have a plan in hand so you're not hoisted upon the petard of your own impulses. If you don't have the time to correct rewrites or extra-credit projects and are locked into your grading criteria for the semester, the only other "out" is to tell students you will work with them before the next assignment by brainstorming strategies for doing better on that one. It doesn't hurt to remind students that a "B" is an honors-level grade and mathematically it is possible to obtain a "C" or "D" on an assignment but still average a "B" for the course. (Show them the math, or they won't believe you!)

Above all, though, hold onto your standards, even when it entails separating your personal and professional sides. Tears are hard to resist and no one wants to announce a plague, but as any physician will tell you, a careful diagnosis is needed before there's any hope of recovery.

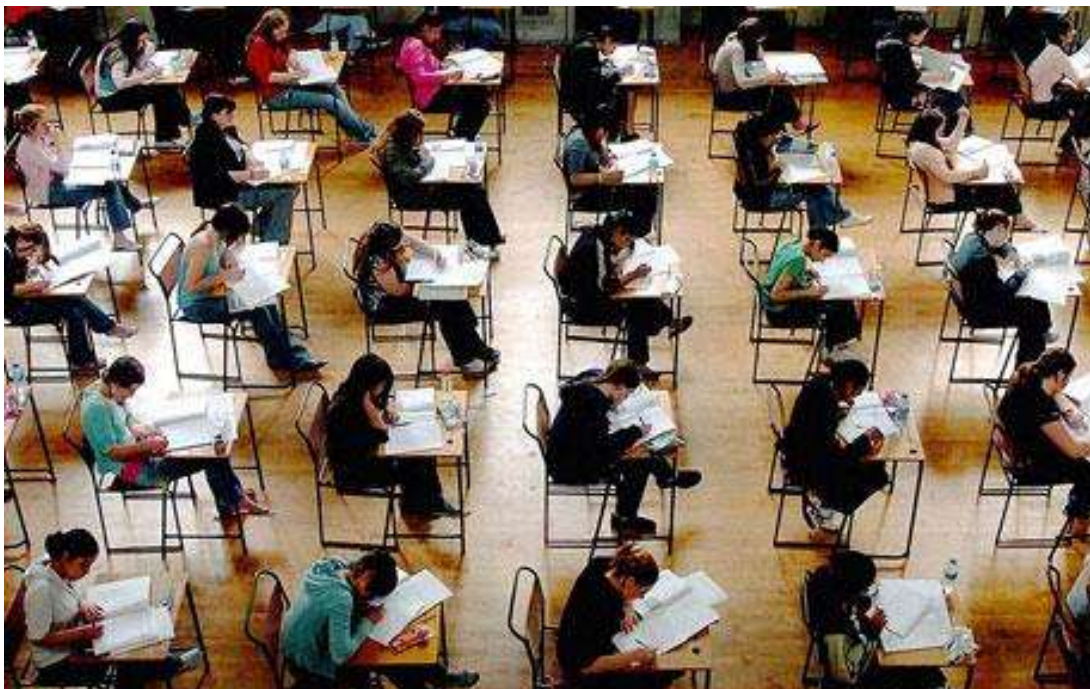
Read more: <http://www.insidehighered.com/advice/2011/11/11/essay-how-deal-complaints-about-grades-papers#ixzz1dQVvCNz6>
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Fresh warning over A-level grade inflation

A-level results have soared at more than five times the rate of other end-of-school exams, new figures show, prompting fresh concerns over “grade inflation”.



A-level results have increased much quicker than scores in the IB, according to figures. Photo: PA



By [Graeme Paton](#), Education Editor

10:00PM GMT 04 Nov 2011

Data shows that average scores have increased by almost a quarter – 24 per cent – since the mid-90s.

Over the same period, results in the International Baccalaureate – a Swiss-based qualification favoured by dozens of independent schools – rose by less than 4.5 per cent.

The disclosure, in an analysis by the website [Socialglue Schools Guide](#) will fuel concerns that the sharp year-on-year rise in A-level grades is down to politically-motivated changes to the exam – and the comparable ease of tests – instead of rising standards in schools.

Jonathan Gittos, the website’s editor, said: “IB and A-level are taken by candidates of the same age and same schools.



“IB grades have gone up slightly in the UK compared to the rest of the world but the only reasonable explanation, we can think of, for most of the rise in A-level grades, is that the exam has become easier”.

He added: “One of the attractions of the IB is that it’s administered from Geneva and so seen as being freer from political interference and more reliable.”

Currently, students are awarded a certain number of points for each A-level exam, with higher grades attracting more points.

According to figures, the average points per entry in 1996 was 181.3, but by 2011 this increased to 224.7 – a rise of almost 24 per cent.

Over the same period, average points in the IB, which uses a different scoring system, increased from 31.6 to just 33 – a rise of 4.4 per cent.

The rise comes after Michael Gove, the Education Secretary, claimed that a shake-up of the traditional A-level grading structure was needed because of the rise in top grades.

He suggested that a fixed proportion of elite A* grades could be awarded each year to mark out the most exceptional candidates.

An alternative system in which all pupils are ranked in set order according to their performance in comparison with other teenagers could also be introduced, he said.

Speaking last month, Mr Gove insisted education standards had risen in recent years but not by the extent witnessed in exam results.

The rise may be driven by exam re-sits, the introduction of bite-sized modules and highly-structured questions that “sometimes lead the students by the hand through the process of acquiring marks”, he said.

<http://www.telegraph.co.uk/education/secondaryeducation/8870425/Fresh-warning-over-A-level-grade-inflation.html>





Operation Graduation

November 11, 2011 - 3:00am

By

Elizabeth Murphy

When student veterans are supported by their colleges and universities, their grades, retention and graduation rates are higher than those of their peers, according to a study released Thursday.

The report, "Completing the Mission: A Pilot Study of Veteran Students' Progress Toward Degree Attainment in the Post 9/11 Era," examined a sample of 200 of the 6,400 student veterans studying at seven public institutions across the country during the 2010-11 academic year. Operation College Promise and the Pat Tillman Foundation jointly prepared the report.

More than 500,000 veterans have used the benefits offered to them through the Post-9/11 GI Bill, which provides financial help for student veterans, since August 2009, according to the report. That number is likely to rise, the report says, as more troops are withdrawn from Iraq and as the job outlook dims with a still-faltering economy.

The universities chosen for the study -- Arizona State University, Mississippi State University, Montclair State University, Richard Stockton College of New Jersey, Texas State University, University of North Carolina at Charlotte and University of South Florida -- all offer solid student support to veterans, said Wendy Lang, director of Operation College Promise, a military-focused organization created by the New Jersey Association of State Colleges and Universities. About 90 percent of the 200 students examined in the report were enrolled full-time, Lang said.

The study found:

- Student veterans were earning an average grade point average of 3.04.
- The retention rate from fall 2010 to spring 2011 was 94 percent, above the national average of 75 percent for first- to second-year retention.
- About 71 percent of students earned all of the credits they pursued, with an average of 24 credits for the academic year.

"The concern is that it's one thing to get a veteran student to a college campus, but if that veteran student gets to campus and doesn't receive support services they will not get a degree," she said. "And that's the real tragic loss."

Lang said veterans lose the benefits they receive through the GI Bill, like a housing allowance, when they drop out, which puts them in greater danger of not finding employment.

And the down financial climate, by turn, makes creating support services for veterans on campuses difficult, she said. Lang said Operation College Promise works with institutions to help find ways to retrofit services they already have to assist veterans, too.

The report states that students in this current population of student veterans are more likely than their peers to be first-generation college students, male, married and with at least one dependent.





Lang said these veterans often had never considered going to college. But the increase in veteran enrollment may signal a positive change for those service members, she said.

Hunter Riley, director of programs at the Pat Tillman Foundation, said he hopes this first step will shed light on the fact that there needs to be more investment in the education of veterans. The GI Bill, like any federal program, has its limits and flaws.

He said the researchers would like to continue to follow this cohort of student veterans as they maneuver their way through the higher education system. He'd also like to branch out and examine student veterans at institutions that do not offer a wide array of support services to offer comparative data.

Read more: <http://www.insidehighered.com/news/2011/11/11/student-veterans-do-better-peers-when-given-support-services#ixzz1dQWFtZKH>
Inside Higher Ed

<http://www.insidehighered.com/news/2011/11/11/student-veterans-do-better-peers-when-given-support-services>



China as Paper Republic**By LIGAYA MISHAN
CHINA IN TEN WORDS**

By Yu Hua. Translated by Allan H. Barr

225 pp. Pantheon Books. \$25.95



In 1978, 18-year-old Yu Hua was assigned the task of administering vaccinations in southern China. The only needles available were barbed from overuse, and with each shot he extracted a scrap of flesh. At night, haunted by the sobs of children whose arms he had bloodied, he would grind the needles sharp until his fingers blistered. In the introduction to his new essay collection, “China in Ten Words,” he blames himself for making the children suffer, and says he should have tested a needle on his own arm — sacrificed his own chunk of flesh. It is a shrewd gambit for a Chinese writer seeking to speak his mind without bringing down the ire of the government: to begin by offering, in proper Maoist tradition, self-criticism.

This does not, however, seem to have appeased the censors. “China in Ten Words” depicts a morally compromised nation, plagued by escalating unemployment, class polarization and endemic corruption and waste. At the extremes, peasants traverse the land selling their blood to the highest bidder while multimillionaires build mansions that are replicas of the White House. “By day a company executive sits at his desk in a copycat version of the Oval Office,” Yu Hua writes. “By night he takes his pretty secretary by the hand and leads her into the copycat Lincoln Bedroom.”

The book has not been published in China, where Yu Hua still lives, yet its unflattering details are not far removed from the gold-plated toilets and artificial hymens of his previous book, the satirical novel “Brothers,” which sold over a million copies in his native country. In an Op-Ed that appeared in *The New York Times* in June, he explained the difference in the books’ reception: “‘Brothers’ does a May 35th” — the term Chinese bloggers use to circumvent the censors when referring to the 1989 Tiananmen Square crackdown — “and ‘China in Ten Words’ is more like June 4th,” the actual day of the massacre.



Such lexical innovations, evasions and revisions give “China in Ten Words” its form. Each essay is devoted to a particular word — its origins, its devaluation or appreciation in meaning — starting with “people” (as in “serve the”) and ending with “bamboozle,” an arc that, for Yu Hua, seems to pretty much sum up the past half-century of Chinese history.

At times his interpretations can seem dogmatic. To American readers, “grass roots” simply describes “the common people.” He defines it more rigidly as “disadvantaged classes that operate at some remove from the mainstream and the orthodox.” (The protesters at Zuccotti Park may agree.) He charges that the poor were “banned” from entering the Olympic Park in Beijing in 2008, when what he means is that they could not afford tickets for admission. Welcome to capitalism.

As in “Brothers,” the tone here is populist, with many comic digressions. This is a tale told by a raconteur, not an academic — an uneven mixture of memoir and polemic, farce and fury, short on statistics but long on passion. The most powerful and vivid sections reach back to Yu Hua’s childhood during the Cultural Revolution, when Mao’s quotations were plastered everywhere, even on spittoons, and the slightest misstep — folding a picture of Mao so that a cross appeared on his face, for example — could have you labeled a counterrevolutionary.

Embedded in this is the story of how Yu Hua became a writer. He hunted down illicit copies of Western novels, which had gone through so many furtive hands that often the final pages were missing. “How these stories without resolutions made me suffer!” he recalls. “I began to think up endings for myself.”

“China in Ten Words” is itself inconclusive. Yu Hua offers one last memory, of how as a child he faked a stomachache to get out of chores and wound up on the operating table. (His father was a doctor.) It is a cautionary tale about the risks of subterfuge, of trying to sneak something past one’s father — or, perhaps, one’s ever vigilant government.

Ligaya Mishan is a frequent contributor to The Times.

<http://www.nytimes.com/2011/11/13/books/review/china-in-ten-words-by-yu-huatranslated-by-allan-h-barr-book-review.html?nl=books&emc=booksupdateema3>

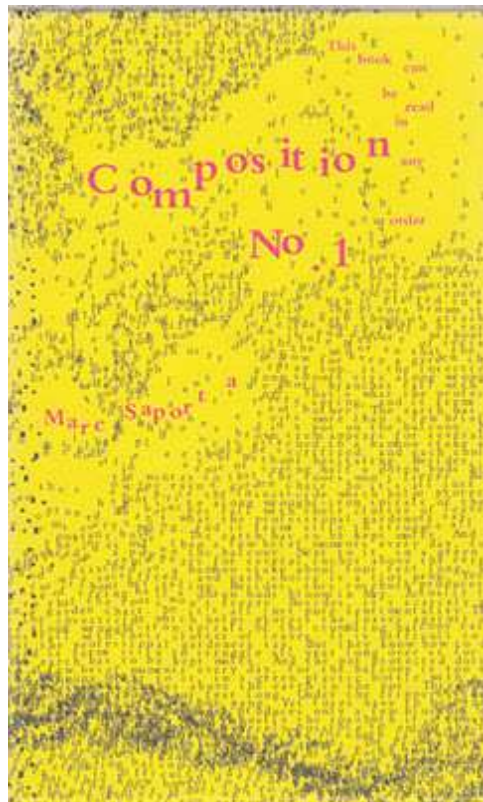


Composition No.1: The First Book in a Box, Redux

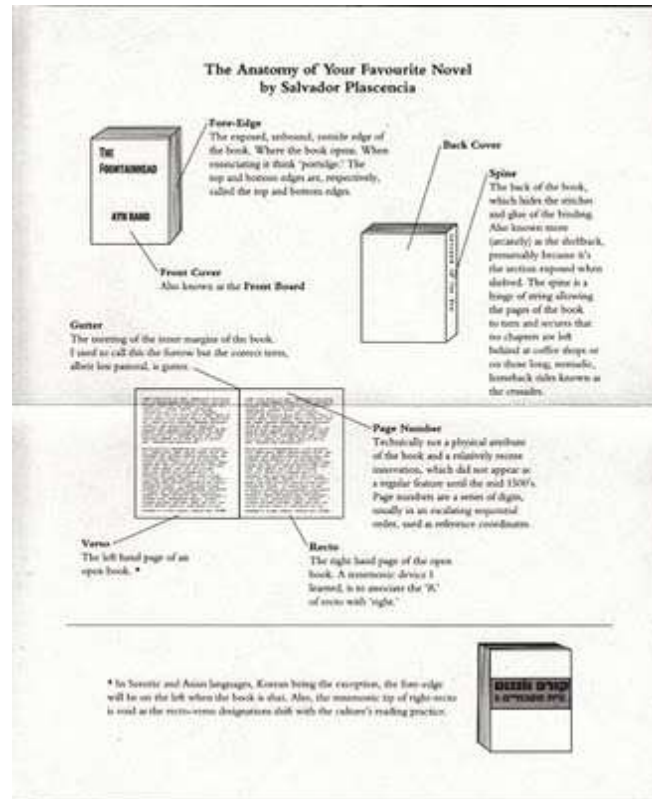
Posted: 10 Nov 2011 10:52 AM PST



In the 1962 Marc Saporta published *Composition No. 1*. It was the first published book that came in a box. Of course, there had been books published in slipcases or that were laid in boxes for many years prior to the release of *Composition No. 1* but there hadn't been one that consisted of single sheets laid into a box where "each page has a self-contained narrative, leaving it to the reader to decide the order they read the book, and how much or how little of the book they want to read before they begin again."



There were no page numbers, no chapters, no table of contents. For their third offering the forward-looking London publisher Visual Editions has taken Saporta's work and filtered it through their progressive lens. The result is a compelling production designed by Universal Everything, featuring an introduction by Tom Uglow of Creative Labs Google and Youtube and illustrations by Salvador Plascencia. Plascencia has also created a chart looking at all the different components that make up a "typical" book.



Here's the trailer:

[Book available here](#)

Other books from Visual Editions:

[The Life and Opinions Of Tristram Shandy, Gentleman](#) by Laurence Sterne

[Tree Of Codes](#) by Jonathan Safran Foer

Also worth noting - A portion of the funding for Visual Editions comes from the [Arts Council of England](#) which receives some of its monies directly from the Lottery!

http://feedproxy.google.com/~r/BookPatrol/~3/SCH0hkODoiQ/composition-no1-first-book-in-box-redux.html?utm_source=feedburner&utm_medium=email

The Subconscious Shelf

By LEAH PRICE



As a teenage baby sitter, I went straight for the books. No sooner did the door close behind the spruced-up parents than I was on the prowl: the bedside table for erotica, the kitchen counter for cookbooks, the bathroom for magazines, and finally the official living-room shelves. Only then did I scan the refrigerator.

The French gastronome Brillat-Savarin began “The Physiology of Taste” (1825) by declaring, “Tell me what you eat, and I will tell you what you are.” You are also what you read — or, perhaps, what you own. In my college dorm, a volume of Sartre was casually spread-eagled across the futon when I expected callers. We display spines that we’ll never crack; we hide the books that we thumb to death. Emily Post disapproved: her 1930 home decorating manual compared “filling your rooms with books you know you will never open” to “wearing a mask and a wig.”



To expose a bookshelf is to compose a self. The artist Buzz Spector's 1994 installation "Unpacking My Library" consisted of all the books in his library, arranged "in order of the height of spine, from tallest to shortest, on a single shelf in a room large enough to hold them." Shortly after the 2008 election, a bookstore in New York set out 50-odd books to which Barack Obama had alluded in memoirs, speeches and interviews. The resulting collection revealed more about the president-elect than did any number of other displays of books by and about him.

Of course, not all the spines we display have real books behind them. In the 1830s, the poet Thomas Hood devised a set of painted spines for a door to a library staircase in the Duke of Devonshire's grand country house at Chatsworth (the original for Pemberley in "Pride and Prejudice"). Puns traditionally painted on dummy spines, like "Essays on Wood," stood next to titles of Hood's invention, like "Pygmalion, by Lord Bacon." A few decades later, Charles Dickens had a door in his study painted with fake spines bearing titles like "History of a Short Chancery Suit" (in 21 volumes) and "Cat's Lives" (in nine).

But why display fakes when you can buy real books you have no intention of reading? More than a millennium before print, Seneca criticized "those who displayed scrolls with decorated knobs and colored labels rather than reading them," noting, "it is in the homes of the idlest men that you find the biggest libraries." And before there were coffee-table books (a 1962-vintage replacement for "grand-piano books"), "furniture books" had already attracted scorn. An 1859 article of that title compared bibliophiles who cared more about bindings than about words to lovers who "think more of the jewels of one's mistress than of her native charms."

Lord Chesterfield, writing in 1749, agreed. "Due attention to the inside of books, and due contempt for the outside," he pronounced in a letter to his son, "is the proper relation between a man of sense and his books." A century later, an evangelical magazine contrasted the good child who "puts books into his head" with the lazy child whose books are "only on your shelves."

Because books can be owned without being read and read without being owned, bookshelves reveal at once our most private selves and our most public personas. They can serve as a utilitarian tool or a theatrical prop. For a coffee-table book of my own, I recently toured a dozen writers' book collections. Gazing at the shelves of a novelist whose writings lie dog-eared on my own bookcase, I felt as lucky as a restaurantgoer granted a peek at the chef's refrigerator. The Duke of Devonshire's library, in contrast, with its *trompe l'oeil* bookshelves, bore more resemblance to a Viking range littered with takeout cartons.

For centuries, portraitists posed sitters with a book; today, subway ads for ambulance chasers picture the lawyer against a backdrop of leather-bound law reviews, and the Strand bookstore in New York City sells leather-bound multivolume sets to interior decorators and set designers seeking to connote old money, along with more prosaic books by the foot, for sale or rent. In the 1940s, the Irish humorist Flann O'Brien proposed a "book handling" service for clients who liked the look of a well-stocked library but lacked the time or ability to read its contents themselves. If you joined his book club, O'Brien explained, "we do the choosing for you, and, when you get the book, it is ready-rubbed, i.e., subjected free of charge to our expert handlers," at a series of different price points:

"Popular Handling — Each volume to be well and truly handled, four leaves in each to be dog-eared, and a tram ticket, cloak-room docket or other comparable article inserted in each as a forgotten book-mark. . . .

"Premier Handling — Each volume to be thoroughly handled, eight leaves in each to be dog-eared, a suitable passage in not less than 25 volumes to be underlined in red pencil, and a leaflet in French on the works of Victor Hugo to be inserted as a forgotten book-mark in each. . . .

"De Luxe Handling — Each volume to be mauled savagely, the spines of the smaller volumes to be damaged in a manner that will give the impression that they have been carried around in pockets, a passage in every





volume to be underlined in red pencil with an exclamation or interrogation mark inserted in the margin opposite, an old Gate Theatre programme to be inserted in each volume as a forgotten book-mark (3 percent discount if old Abbey programmes are accepted), not less than 30 volumes to be treated with old coffee, tea, porter or whiskey stains, and not less than five volumes to be inscribed with forged signatures of the authors.”

Today, even as virtual bookshelves find new homes on Web sites like Shelfari.com, the tradition of fake spines lives on, including at Google Books. In Google’s office in Cambridge, Mass., a dozen flat strips of plywood are glued to the wall at right angles to equally flat vertical strips of paper, each bearing the title of a book. These strips were once spines, sliced from volumes disbound for scanning as part of Google’s enormous digitization project. Like a taxidermist’s trophies, the wall décor attests to a successful slaughter.

Still, the rise of e-books may have a silver lining. Once “content” becomes available online, the only place left for its erstwhile containers is the coffee table.

Leah Price is a professor of English at Harvard and the author of the forthcoming “How to Do Things With Books in Victorian Britain.” This essay is adapted from her book “Unpacking My Library: Writers and Their Books,” to be published later this month.

http://www.nytimes.com/2011/11/13/books/review/the-subconscious-shelf.html?_r=1&nl=books&emc=booksupdateemb4



Gilad Shalit and the Rising Price of an Israeli LifeBy **RONEN BERGMAN**

On the afternoon of June 27, 1976, Palestinian and German terrorists hijacked an Air France flight originating from Israel and directed it eventually to Entebbe Airport in Uganda, where most of the non-Israelis on board were immediately released. More than 100 hostages remained, 83 of whom were Israeli. They were held for the next six days, until an elite team of Israel Defense Force commandos freed them in the famous raid known as Operation Entebbe. The name of the mission became synonymous with Israel's refusal to give in to the demands of terrorists and its willingness to go to extraordinary lengths, and risk many lives, to free Israeli hostages.

Despite Prime Minister Yitzhak Rabin's final decision to use a military operation to rescue the Entebbe hostages, recently declassified documents tell a more complex story, one that reveals Rabin's doubts about the mission and exposes the inescapable dilemma, which has only intensified over the years, at the heart of Israel's policy toward its own captured citizens. We now know that even as the raid was being planned, the Rabin government was making contact with various international middlemen to obtain a list of the hijackers' demands, and Rabin himself privately said he was willing to release the 53 prisoners the terrorists had named. During the secret discussions prior to the Entebbe operation, Rabin, who agreed to the mission after much persuasion by intelligence and ministry planners, effectively established the principle that is still followed by all Israeli leaders facing hostage situations: if the necessary intelligence is available and the operational circumstances allow, force — even a great deal of it — will be used to free hostages; if not, Israel will negotiate a prisoner exchange.

Rabin signed off on the Entebbe plan only after intelligence agents assured him that aerial surveillance showed Ugandan soldiers guarding the terminal where the hostages were being held, indicating that the building was not booby-trapped. (These same documents also reveal the orders to follow if the commandos



ran into Idi Amin himself. “He isn’t a factor,” Rabin said. “If he interferes, the orders are to kill him.” To which the foreign minister, Yigal Allon, added, “Also if he doesn’t interfere.”)

Amos Eiran, who was then director general of Rabin’s office, told me recently: “On the morning of the operation, Rabin summoned me and went over the wording of the resolution he was going to propose to the cabinet on the subject of the operation. He was wearing a dressing gown and was very tense. He accompanied me to the elevator and said: ‘Prepare for me a draft letter of resignation. I give the operation a 50-50 chance. If it fails, I’ll accept all the responsibility and resign.’ I asked, ‘What will you see as a failure?’ and he replied, ‘Twenty-five or more dead.’” When the mission was completed, three passengers and one Israeli soldier were killed.

Thirty-five years later, many who took part in Operation Entebbe at the highest levels were also involved in the negotiations to bring home Gilad Shalit, the Israeli soldier who was abducted by Palestinian commandos on June 25, 2006, and whose capture has consumed Israeli society for the last five years. Shimon Peres, then Israel’s defense minister and now its president, signed the pardons for the Palestinian prisoners who were released in exchange for Shalit. Ehud Barak, a planner of the Entebbe raid, is today Israel’s defense minister. Tamir Pardo, who is currently the chief of Israel’s intelligence agency, the Mossad — and whose support helped Prime Minister Benjamin Netanyahu push the Shalit deal past skeptics in his administration — was the communications officer for the commander who led the raid in Entebbe. That commander, Yonatan Netanyahu, was the only Israeli military casualty of the operation, struck by a bullet while advancing with his men toward the terminal where the hostages were held. In the command bunker in Tel Aviv, when Peres learned that Yonatan Netanyahu had been killed, he told those present that Israel had lost “one of most wonderful people there has ever been in this country.”

It was at the antiterrorism foundation established by the Netanyahu family in honor of Yonatan’s memory that his younger brother Benjamin began his career. In 1986 he edited a book titled “Terrorism: How the West Can Win,” which argued intensely against negotiating with terrorists under any circumstance. In one of the two articles he contributed to the book, Netanyahu wrote: “This is a policy that in effect tells the terrorists that we will not give in to your demands. We insist that you free the hostages. If you do not do so peaceably, we are ready to use force. We are offering a simple exchange: your life for the lives of the hostages. In other words, the only ‘deal’ we are prepared to do with you is this: If you surrender without a fight, you will stay alive.”

Today, when explaining how he, of all leaders, could sign the agreement that marked a new record of acquiescence to a terrorist organization — the release of 1,027 prisoners, many of them with Israeli “blood on their hands” — Netanyahu falls back on the policy that was laid down by Rabin in the deliberations leading up to Entebbe: the intelligence and the operational circumstances left him no alternative but to make a deal.

“We had no choice,” a source close to Netanyahu told me after Gilad Shalit returned home. “There were innumerable other possibilities for exerting pressure which resulted in nothing. Bibi would have been happy to try and rescue Shalit in a military operation, if that would have been possible, but the intelligence community could not locate him. In the end, the question was whether to leave Gilad rotting in a pit in the Hamas prison or to take a bold decision. That’s what Bibi did.”

Gilad Shalit grew up with his parents, Aviva and Noam, and his brother and sister in a small community in western Galilee, not far from the Lebanese border. At school, Gilad loved math and sports, and he possessed an encyclopedic knowledge of the American N.B.A. He joined the army in 2005 as a teenager and, despite a marginal health classification, was accepted into a combat unit that was dispatched in the spring of 2006 to protect the Israeli communities along the border of the Gaza Strip.

On June 25 of that year, Gilad, then 19, was one of the crew of a Merkava tank deployed near the border fence at the southern end of the strip. A squad of eight Palestinian commandos burrowed beneath the fence





and split into three groups when they emerged, targeting an observation tower, an empty armored personnel carrier that the Israelis had placed as a decoy and the tank in which Shalit was stationed. They crept silently forward, eventually taking the Israelis by surprise. One of them fired a rocket that hit the tank and wounded its commander, and in the firefight that followed, two Israelis were killed. Shalit and one other soldier at the tank were wounded. The other wounded soldier caught a blurred glimpse of Shalit being dragged away by the Palestinians, who escaped back through the border fence, on which Shalit's flak jacket was later found hanging.

Within days, Israel launched a series of heavy bombardments on Gaza, code named Operation Summer Rains, destroying the power station and cutting off electricity to tens of thousands of people there. Dozens of Hamas officials were arrested, and Israeli troops shut down the borders in order to search Gazan neighborhoods for Shalit. Hamas responded with volleys of rockets fired at Israeli settlements, to which the Israelis retaliated with even more bombardments.

According to the Israeli human rights organization [B'Tselem](#), in the fighting that continued until a cease-fire was reached on Nov. 26, 2006, 416 Palestinians were killed (5 Israelis were also killed, one by friendly fire). The cease-fire endured on and off until late 2008, when clashes broke out between Hamas and the I.D.F. along the Gaza border. Israel then launched Operation Cast Lead, an extensive invasion of the Gaza Strip that resulted in 1,390 Palestinian deaths, 700 of whom were Hamas, 454 of whom were women and children. This was followed by yet another cease-fire, one that appears to be disintegrating now, in the wake of Shalit's release.

The Gaza Strip, where Shalit was held, is very small and densely populated and is surrounded almost entirely by Israeli ground and naval forces. Gaza itself is subject to constant aerial surveillance by drones and is rife with informers and collaborators with Israel. Finding Shalit became a top priority for Israel's intelligence agencies, which soon received information on the precise location at which he was being held: a fenced private residence on the outskirts of Gaza City. Planning for a rescue operation was under way when Israeli intelligence learned that Hamas, in cooperation with Iranian intelligence, had planted false information in order to lure Israelis into raiding the booby-trapped house. The operation was called off, and Shalit's location was never established. It is very unlikely that we will ever learn where he was held. The degree to which Gaza, unlike the West Bank, is opaque to Israeli intelligence has profound implications for future operations there. The inability of Israeli intelligence to discover Shalit's place of captivity in a small space that is an hour's drive from Tel Aviv was a profound failure, one to which the departing heads of Israel's three security organizations — Mossad, Shin Bet and the military — all admitted when they retired this year.

On July 12, two and a half weeks after their son's capture, Noam and Aviva Shalit met with Prime Minister Ehud Olmert, who told them that he had information indicating that Gilad was alive and well. The parents asked if he had precise information on where their son was being held.

"We are doing everything to find him," Olmert replied, "but I am sorry to say that so far we have no solid, unequivocal information." The Shalits implored Olmert not to stage a military rescue operation that would endanger the life of their son and the lives of other soldiers, even if the necessary intelligence was obtained.

As Olmert was explaining to them that he was not prepared under any circumstances to enter into negotiations with Hamas, his top military aide handed him a message saying that two more Israeli soldiers had been abducted, this time by the extremist Shiite militia Hezbollah, on the Lebanese border. (Olmert denies discussing the possibility of a military rescue with the Shalits or his negotiating stance with Hamas.)

Olmert ordered a full-scale war to free the two soldiers and to show Hezbollah that, as the common Israeli expression goes, "the boss has gone crazy" — that Israel would respond disproportionately to abductions. The Lebanon war lasted a month and became a humiliation for Israel, failing to cause significant long-term military or political damage to Hezbollah and failing, too, to recover the missing soldiers.





Three weeks after the two men were seized, the Israeli Defense Forces produced a report saying that one of them had been killed and the other received grievous wounds and was in all likelihood dead, but withheld this report from the prime minister for reasons not clear to this day. It is speculated that it was either neglect or the desire from elements in the higher ranks not to provide Olmert a reason to stop the operation. In a strange circumstance, I happened to be the one who informed Olmert's staff of the report, when I visited his office on the last day of the war. Though Olmert says that he knew that the soldiers were killed from the start, the fact that such a report existed and that the prime minister had learned of it from a journalist caused a public uproar in Israel when it became known a year later.

I have covered Israeli hostage and M.I.A. cases for more than 15 years, including the covert ways in which Israel's powerful espionage agencies operate to bring soldiers home alive or dead. Over that time, the issue has come to dominate public discourse to a degree that no one could have predicted. Israeli society's inability to tolerate even a single soldier held in captivity results in popular movements that have tremendous impact on strategic decisions made by the government. The issue has become a generator of history rather than an outcome of it.

Why this is the case is difficult to say, because it requires a plumbing of the Israeli psyche. Certainly, part of it has to do with a Jewish tradition that sanctifies life, and with the necessity for Jews of a proper burial. And part, too, is rooted in the tradition expressed by Maimonides, that there is no greater religious duty than the redemption of prisoners — a powerful idea in a country whose citizens are required to be soldiers. As Noam Shalit emphasized, there is an “unwritten contract” between the government and its soldiers.

On the day Shalit was released, the country held its breath. Service in banks came to a halt because clerks could not stop watching the live video of Shalit's movements, from Gaza to Egypt and then from Egypt to Israel. All over the country, banners and signs were hung, welcoming him home. Gilad was everyone's son, everyone's brother. To Israelis, his release was arguably the most significant event of the last 10 years. The exuberance at his return drowned out whatever protests existed of the deal that was made to bring him home.

It is hard to fathom the price Israel paid for Shalit without placing it in the context of previous prisoner swaps, originally with Palestinian organizations and later with Hezbollah. The first to grasp how sensitive Israeli public opinion was on the issue of hostages and M.I.A.'s — and therefore what a powerful weapon abduction could be — was Ahmed Jibril, the leader of a faction of the Popular Front for the Liberation of Palestine. In 1979, Israel reluctantly agreed to its first disproportionate exchange with a guerrilla organization when Jibril insisted on getting 76 P.L.O. members in exchange for one hostage.

Jibril's greatest success came in the mid-1980s, when in exchange for three Israeli soldiers he demanded the release of 1,150 prisoners. The group included some of the most infamous terrorists held by Israel, including Kozo Okamoto, a Japanese Red Army member who participated in the massacre of 26 people at the arrivals hall in Lod Airport in 1972. In the wake of Jibril's demand, Israel attempted to put counter-pressure on him by kidnapping his sister's son, Murad al-Bushnak, whom Israeli agents lured to Beirut with promises of a weekend of sex, drugs and gambling. Instead, Bushnak was captured and taken to an underground interrogation cell, where he quickly gave up the phone number of Jibril's home in Damascus. A senior intelligence officer dialed the number and made Jibril a simple offer: a quick swap, without anyone knowing, of Bushnak for the three Israelis. Jibril calmly upped his price to include his nephew.

If Jibril served as the inspiration for terrorist organizations, on the Israeli side it was Miriam Grof, the mother of one of Jibril's Israeli captives, Yosef Grof, who became the model for the families of abductees. Without any experience in dealing with the media, Grof instinctively created strategies that have been used repeatedly by relatives of Israeli P.O.W.'s and M.I.A.'s. She grasped that public pressure on the government is a result of being aggressive and proactive: you make demands, not requests; you focus on what is important to you, not on the good of the country. One former high-ranking member of the I.D.F. recalled her saying that half the country could go up in smoke, just as long as her Yosef came home safe.





Eitan Haber, a respected military correspondent who later became a senior aide to Rabin, told me: “It is difficult to explain, but only someone who met that woman could understand how she filled everyone with a deep, blood-boiling, paralyzing sense of shame. We are speaking about three very tough men [Rabin, Peres and Yitzhak Shamir, the foreign minister] who had no problems saying no, but simply could not stand up to Mrs. Grof. What tipped the scales was not her tears or screaming or her teeth-grinding — all of which I remember clearly — it was the whole package. There was something menacing about her that threatened that the world was coming to an end. Her aggressiveness was not of this world. She broke them all down.”

In large part it was Miriam Grof’s battle for her son that allowed Jibril to get his deal: 1,150 Palestinian prisoners were freed, one of whom was the wheelchair-bound Sheik Ahmad Yassin, who later founded and led Hamas, the same movement whose suicide attacks exacted an enormous and bloody toll on Israelis, and the group that would one day capture Gilad Shalit.

In Lebanon, Hezbollah learned from Jibril’s tactics and perfected them. In January 2004, 435 Lebanese and Palestinian prisoners were released in exchange for the corpses of three Israeli soldiers killed in an ambush on the northern border, as well as one live hostage, Elhanan Tannenbaum. Tannenbaum was a shady businessman and a colonel in the reserves, who of his own free will went to meet Hezbollah agents who lured him to Dubai with the promise of a lucrative drug deal. In Dubai, his contacts sedated him, packed him in a crate and sent him via Iranian diplomatic mail to Beirut, where he was held in solitary confinement for more than three years.

The 2004 deal was led by Prime Minister Ariel Sharon, who more than any other Israeli leader stood as the symbol of Israel’s aggressive stance toward terrorism. Assaf Shariv, Sharon’s media adviser and later Israel’s consul general in New York, told me: “Sharon was wounded in combat in Israel’s War of Independence in 1948, left behind in the field and almost became a prisoner himself. He recalled that moment as a deep trauma and was haunted by visions of the bodies of Israeli soldiers and those taken captive in Jordan during the ’50s. He vividly remembered and gave horrific descriptions of them. He said of Tannenbaum, ‘I don’t care what he did, but I am not about to leave a Jew in the hands of those Arabs.’ I am sure that if Sharon had been prime minister during the last few years, he would have signed the deal for Shalit long ago. It turns out that even the toughest have their weak spots.”

In the asymmetrical war between Israel, with its powerful military and sophisticated intelligence apparatus, and the much weaker guerrilla groups who operate from places like Gaza, where daily life is one of constant deprivation, it is not hard to see how the latter have used Israel’s sensitivities regarding its citizen-soldiers to their advantage.

In September 1997, Hadi Nasrallah, the son of the Hezbollah leader Hassan Nasrallah, was killed in a skirmish with Israeli troops. The Israelis hoped that with his body in their hands, negotiations for the return of the bodies of Israeli soldiers held by Hezbollah would accelerate. Yaakov Perry, the former head of Shin Bet, Israel’s internal security service, was in charge of the case at the time. “We were optimistic,” he told me when we recently spoke. “We thought it would bring a solution closer, but Nasrallah was indifferent. He instructed his men not to put his son’s name at the top of the list and to treat him the same as all the other fallen militiamen. Later I heard that when Hadi’s coffin arrived in Lebanon, his father lifted the lid, glanced at the body of his beloved son and closed it. Not a muscle in his face moved.” The president of German intelligence at the time, August Hanning, who mediated an eventual deal between Israel and Hezbollah, told Perry in bewilderment that although Nasrallah grieved deeply for his son, “the body is another matter. You Israelis have a very unusual attitude on this matter.”

The “sensitivity” of Israel to the body issue has led to the absurd situation in which Israeli soldiers occasionally find themselves risking their own lives — some have been killed in the process — in efforts to extricate the bodies of their comrades from battle, so that those bodies won’t become bargaining chips for future negotiations.





Maj. Gen. Yaakov Amidror served as a senior officer in military intelligence for decades and today serves as national security adviser to the prime minister. “I believe that it is right to endanger the lives of soldiers in operational actions in order to bring about the release of a living hostage or to get information,” Amidror told me in an interview in 2009. “But the important principle is not to conduct any negotiation for the bodies of abducted soldiers or for living hostages. Israel has trapped itself in an impossible position, in which it sacrifices vital security interests in order to return hostages or their bodies, and this exceeds all the limits of reason. If, for example, it was clear to Hamas or any other organization that we do not pay anything and do not negotiate, the motivation to kidnap would be significantly lower.”

Two days after Shalit’s abduction, Prime Minister Ehud Olmert declared in the Knesset that he and his government were “dealing with only one matter” — securing the release of Shalit. Olmert’s capitulation to Hezbollah’s demands for the remains of the two soldiers set a precedent for the high price to be paid for the bodies of Israeli M.I.A.’s. The weight of these deals made bargaining for Shalit’s freedom nearly impossible.

Because the Israeli government refuses to speak directly to Hamas, negotiations in the months following Shalit’s capture were mediated by senior officers of Egyptian intelligence, who at the time had an office in Gaza (they were expelled when Hamas took full control of the Gaza Strip in 2007). In December 2006, an outline of an agreement was reached, under which Israel would free 450 Hamas prisoners from a list that would be agreed upon by both sides. In a second phase, after Shalit was repatriated, Israel would release another 550 prisoners (making a total of 1,000), whom it would select itself. The only point of contention was over who was to be included in the first list. For reasons that are not clear, Israel insisted that Hamas draw up the initial list. When it did so, predictably including the names of its most prominent prisoners — figures the Israeli government had vowed never to release — negotiations immediately came to a halt and remained there for the next two years.

Then, in late December 2008, while Shalit languished in an unknown location in Gaza and after the cease-fire was broken, Israel launched Operation Cast Lead. The stated goal was to liberate communities close to Gaza from missiles that were being fired on them from the strip, and the Olmert government took pains to say that the operation was not intended to win Shalit’s freedom. And yet, immediately following the operation, Israel announced that there would be no new cease-fire with Hamas — that border crossings with Gaza would not be opened and supplies designated for the population would not be allowed through — until the Shalit problem was solved.

In March 2009, negotiations between Israel and Hamas were held in Cairo, under the auspices of the Egyptian intelligence agency. Hamas insisted on the release of many of its top prisoners and, with few exceptions, refused to agree to their deportation from the West Bank, another major sticking point, as Israel feared that the released prisoners would embark on another wave of terrorism. Meir Dagan and Yuval Diskin, the chiefs of the Mossad and the Shin Bet respectively, opposed any deal. They produced data showing that 45 percent of those released in previous prisoner exchanges returned to terrorist activity. One example was a member of Islamic Jihad, Luay Saadi, who was arrested in September 1999 for providing logistical assistance to terrorists in the West Bank. According to Shin Bet, after his release in the January 2004 Tannenbaum deal, Saadi set up a widespread terrorist network that led to the deaths of 30 Israelis and the wounding of 300. He was assassinated by Israel in 2005.

There were a few dozen names on the Hamas list that the intelligence chiefs had vowed would never be released. One of these was Abbas al-Sayad, who dispatched the suicide bomber who blew himself up at a Passover seder at the Park Hotel in Netanya in 2002, killing 30 people, most of them senior citizens, and wounding 140. “People like that should never see daylight as free people,” Diskin, the chief of Shin Bet, said.

Olmert deliberated, and just before he left the prime minister’s office, in April 2009, he decided that the cost was too high to set so many murderers free. The deal collapsed.





On his last day as head of the Mossad, on Jan. 6 of this year, Dagan invited a group of reporters for an unprecedented visit to the organization's headquarters, perhaps the most secret and well-fortified installation in Israel. We were driven there in a vehicle with blacked-out windows, then carefully searched before entering the building. During this meeting, Dagan sharply criticized the proposed deals for the release of Shalit. "Two hundred thirty-one Israelis were slaughtered by those freed in the Tannenbaum exchange," he said. He recalled how in 1995 he informed a family that their son had been killed during an operation north of Nablus. "How can we go back to that woman and tell her that the man who killed her son and who was planning to murder many Israelis is being released, after he was sentenced to life imprisonment and after we told her he would never be released? What do we say to her?"

As negotiations for his son's fate dragged on, Noam Shalit grew increasingly angry. Noam is an introvert, an industrial engineer for the Israeli company Iscar. His twin brother, Yoel, was killed in the Yom Kippur War in 1973, but Noam refrained from joining anti-government demonstrations at the time. By June 2008, though, immediately after the deal with Hezbollah for the two Israeli bodies, Noam emerged as the commander of an army of demonstrators and a growing protest movement. Advertising and public relations executives offered their services to him free. The country was flooded with posters, billboards and one marketing gimmick after another. At one point, Israeli citizens were offered the chance to "write a letter to Gilad" in a special font that was based on Gilad's own handwriting. Numerous demonstrations were held in the center of Tel Aviv under the slogan "Asking for Gilad's Forgiveness," and on Facebook, hundreds of thousands of Israelis replaced their profile picture with a photograph of Shalit. At one point, a "prison cell" was set up in a TV studio, windowless and cramped, similar to the one in which Gilad was presumed held. Local celebrities vied to take hourlong turns sitting inside it, to feel what it would be like in his shoes — all of which was broadcast live.

Like Miriam Grof before him, Noam Shalit galvanized the nation. "Olmert is a political hack," he told me during one of several conversations I had with him in 2010, in the protest tent that he and Aviva lived in on a sidewalk near the prime minister's residence in Jerusalem. They sat there on white plastic chairs for more than a year, shaking the hands of tens of thousands of well-wishers who made the pilgrimage to visit them. The prime minister's security detail did not dare to expel them from the site.

"This is a man who has never really understood the dangers of being captured behind enemy lines," Noam said of Olmert. "I told Olmert that bringing my son back alive is not a real estate deal."

He added, with uncharacteristic intensity: "Olmert had the nerve to look me in the eye after I said he wasn't doing enough to free Gilad and say, 'I don't have a contract with any citizen of Israel that says that if he is taken prisoner I have to rescue him.' That statement expresses a lack of understanding of the issue in all of its implications, not only on the fate of my son, but of far broader matters." (Olmert says that he understood the Shalits' request, but he adds: "As a prime minister, there are additional perspectives that I'm in charge of. There are things I will not do as prime minister of the state of Israel.")

In the summer of 2009, Benjamin Netanyahu, who replaced Olmert in late March, decided that the Egyptian mediation was ineffective and enlisted German intelligence to negotiate a possible deal for Shalit. Over the next year and a half, the senior German agent in the Middle East, Gerhard Conrad, shuttled numerous times between Israel and Hamas. Under heavy secrecy, with the Israeli military barring publication of his name and photo, he moved around Tel Aviv, astonished that the billboards and the media campaigns on behalf of Shalit were having such a significant effect.

As reported by the German journalist Holger Stark of *Der Spiegel*, by late 2009 Conrad believed that he had managed to broker a compromise deal, but it was rejected by Netanyahu. He had set a limit to what he would agree: most of the freed prisoners would be deported and not allowed to return to their homes in the West Bank, and none of the names on Hamas's "V.I.P. list" would be released.



More than a year went by, and the negotiations remained deadlocked. In January of this year, it seemed as if the Egyptian government under President Hosni Mubarak might succeed in pressuring Hamas into a compromise, but then came the Arab Spring. Suddenly there was no one to talk to in Cairo, and Hamas halted the negotiations.

Beyond the directors of the intelligence agencies, there were also Israelis who were opposed to making a deal with Hamas, mainly the families of victims of terror or members of the extreme right. In late 2009, when Conrad had almost closed a deal, dozens of families of victims gathered outside the prime minister's office to protest against the release of killers. One of them was Yossi Mendellevich, with whom I spoke the week after Shalit was brought home.

Mendellevich described how, on the afternoon of March 5, 2003, he was talking on the phone with his 13-year-old son, Yuval, who was riding a No. 37 bus home from school in the port city of Haifa. "I cracked a joke, and Yuval laughed and said: 'Dad, you are so funny. I love you.' Then there was a sound like an intake of air, like whoosh, and we were cut off. I didn't think anything of it, because there were big problems with cellphones in Haifa at the time. About half an hour later, I got a call from someone asking if Yuval had come home, and I began to worry. Then I understood."

Line No. 37 wasn't chosen by chance. In the early afternoon it is one of the busiest bus routes in the city, carrying students from seven different schools. At 2:15 p.m., Mahmoud Kawasme, a Hamas member from Hebron, boarded the bus, moved to the center and detonated the explosives he was carrying. Seventeen people were killed, many of them schoolchildren, and more than 50 were wounded. Yossi Mendellevich identified Yuval's body in the morgue. Soon afterward, he began waging a struggle against releasing terrorists.

The day after the Kawasme bombing, Israeli security services arrested four Hamas members who recruited him and sent him on his mission. Each of the planners was sentenced to 17 life terms. They were not meant to ever leave prison, but they were among those released in the Shalit deal. I have spoken with Mendellevich several times over the last few years, but he has never sounded so broken as he did in this recent conversation. "I am happy for Gilad and for his family," he said, "but then I see the picture of Yuval, and sadness envelopes me again. You have seen a thing or two in your life: look at this picture of him. Sometimes you can see his innermost thoughts — the purity, the clarity, a kind of thing that is truly good. That is what he was, and my longing for him is as strong as the sense of loss that tears me apart."

I asked him if he would like to kill the four who planned the bombing that killed his son, now that they are free.

"Not I," Mendellevich said. "I am a good boy. A confirmed conformist. I don't even own a gun. I have not done what some other families have done and put a prize of \$100,000 on their heads. But children don't get on buses armed with guns, and there are law-enforcement agencies that are supposed to keep the criminals and killers off our streets. Now those same agencies go and turn the killers loose to come back to the streets, and this after they have become more extreme and more skilled, in the luxurious conditions they were kept in, in our prisons."

I asked him what should have been done. How should Shalit have been brought home?

"No effort was made to put any pressure on Hamas," he said. "Not to mention a military rescue operation. Today there isn't a military leader with the guts to order a rescue operation or a commander in the army with the guts to recommend one. It's possible to get to any place. The I.D.F. has proved this many times, but in the Shalit case, they simply never tried, out of fear that soldiers would be killed on the way."



In the spring of 2011, Netanyahu brought in a man named David Meidan to be his representative in the Shalit case. Born in Egypt, Meidan came to Israel as a child and has served for years in the Mossad, most recently as commander of the organization's Tevel ("universe" in Hebrew) division, which coordinates operations with the intelligence services of other countries. Meidan was one of Meir Dagan's favorites, although he had a radically different perspective on the question of prisoner exchanges.

Negotiations were at a dead end when Meidan took over the post, and he immediately began looking for new directions. "A lot of people offered themselves as mediators," he told me in a conversation in mid-October. "When there is so much 'intelligence noise,' the problem is how to isolate the one thing that is likely to produce results. Both in my previous job and here I kept a sensitive ear open to try and identify that thing."

That thing, improbably, turned out to be an American-Israeli peacenik named Gershon Baskin, who moved to Israel in 1978 to form an N.G.O. devoted to coexistence between Jews and Arabs and who had been a vehement critic of Netanyahu's for the past 15 years.

Six months before Shalit was abducted, Baskin was at a conference in Cairo, where he struck up a friendship with a professor at the Islamic University of Gaza, a member of Hamas whose name Baskin requested not be published. In the days after the abduction, when Israel launched Operation Summer Rains, the professor phoned Baskin and yelled: "Do something! Your government is bombing us nonstop. There's no water and no power."

Through the professor, Baskin was put in contact with Ghazi Hamad, Hamas's deputy foreign minister, and it was this relationship, which took place largely through computer chats over a number of years, that ultimately led to the Shalit deal. Starting days after the abduction, through a relentless series of text messages, e-mail and phone calls, Baskin tried to convince the Olmert government and all other parties involved that he could help broker a deal. For years he was rebuffed as a nuisance by the Israeli officials dealing with the case.

The first message Baskin received from Hamad said that Hamas would free Shalit in exchange for an end to Israel's blockade of Gaza, a total cease-fire and the release of 1,500 Palestinian prisoners. In an effort to make sure Olmert personally received the message, Baskin approached Olmert's daughter, Dana, who agreed to speak to her father. Hamas wanted to know who Baskin's channel to the prime minister was, so he told them about Dana. Shortly after, a senior Israeli intelligence official shocked Olmert by telling him that his daughter's name had been mentioned by Hamas operatives. Out of concern for Olmert's daughter's safety, a member of Olmert's staff called Baskin into his office and told him not to involve Dana. For the next five years, until David Meidan decided to take his call, Israeli intelligence rejected Baskin's offers to help. But Baskin phoned Meidan the day he took the job. "Give me three weeks to get organized," Meidan told him. "I don't even have an office or a secretary." Of their first meeting, Baskin said, "He explained to me that Netanyahu had come to a decision, against his own principles, to bring Gilad home."

Meidan says that it was almost inconceivable that he would enter into a dialogue with the peacenik who said he could mediate a deal on Shalit, but because there was nothing to lose, he decided to try an experiment to see if Baskin's channel of communication could be trusted. He asked Baskin to convey a message asking Hamas to prove that Shalit was still alive.

On June 14, Baskin and Hamad communicated via chat messages, Baskin speaking on behalf of Meidan and Hamad on behalf of Ahmed Jabari, the commander of the armed wing of Hamas, who was holding Shalit. Jabari's is also the first name on Israel's list of terrorists to be assassinated.

"There is no knowledge of how Gilad is for more than one and a half years," Baskin wrote, "and Jabari or anyone else should not expect Israel to be serious about releasing 450 prisoners without exact knowledge on whether or not he is alive and well." Baskin communicated that there were two ways to establish proof of life. The first was a visit by the International Red Cross, in exchange for which Meidan agreed to grant family



visits for Hamas prisoners in Israel who had not seen their families for more than four years. Conveying Meidan's sentiments, he wrote, "a humanitarian gesture in exchange for a humanitarian gesture" and underscored that this was "a technical nightmare for Israel" but that Meidan was willing to ensure it would take place. The second option was a video showing that Shalit was alive.

Israeli intelligence tracked Baskin's messages and found that the pipeline was reliable and accurate. For the next two months, Baskin transmitted the messages to Hamad without any embellishments, and Hamad passed them on precisely to Hamas leadership.

Meidan reported to Netanyahu: "It turns out that Phoenix" — the code name assigned to Baskin by the intelligence community — "is telling the truth, and our messages are going straight to Jabari." Netanyahu gave his approval for the secret communication to continue. (A spokesman for Netanyahu declined to comment on any details of the Shalit release, referring me to his public statements.)

"After five years," Baskin recounted, "this track was now official. I would go to sleep with my mind working on creative ideas — on what I would say to Ghazi, on a proposal for reaching a compromise. My mind was consumed with the negotiations. I was essentially conducting direct negotiations between the government of Israel and Hamas."

In Israel, only the prime minister, the defense minister, the army chief of staff, Meidan and his team and the heads of Mossad and Shin Bet knew of Baskin's involvement. It is strange, even unimaginable, that in the end it was a tenacious peacenik without a budget or agents who succeeded where such powerful intelligence agents had failed. "Someone from Egyptian intelligence told me that I hold each conversation five times," Baskin says, "one for each of the spy agencies listening in on us."

The process was made more difficult by the total lack of trust between the two sides. Here are extracts from a chat between Baskin and Hamad on July 25:

Baskin: "Is there any possibility that Jabari will authorize you to meet me in a third country other than Egypt?"

Hamad: "Gershon, he authorized me and give me full support but he is very sensitive to anything related to something given to Israel. He still have no trust with Israel. . . ."

Baskin: "Did he authorize you to negotiate?"

Hamad: "Hamas is afraid that can be used against them, direct contact with Israel. . . ."

Baskin: "Netanyahu has the same problem with direct contact with Hamas."

In the end, thanks to Baskin's persistence, Meidan persuaded Netanyahu to agree to send Hamas a vague message conveying readiness to compromise. This did not happen in a vacuum: Under intense domestic pressure — among other things, the country's health care system was on the verge of collapse — Netanyahu was desperate for a positive development. Hamas also had its reasons for moving ahead — the Arab spring was exerting considerable pressure on the organization's leaders in Damascus, who feared for their future if President Bashar Assad of Syria fell.



On July 14, Baskin received a message from Hamad saying that Hamas was offering a final resolution on the matter. Baskin faxed the document to Meidan, who as a cautious intelligence officer refuses to work with e-mail.

The Israeli negotiating team was surprised by the document. It promised there would be no further demands from the Palestinian side. Hamas promised to carry on from the point reached by Conrad, the German mediator in February 2011, with amendments that were less drastic than had been anticipated. "These are not simple demands," Meidan told Netanyahu, "but with this we can begin to work."

Meidan, who in the Mossad had been in charge of Israel's secret-intelligence ties with Egypt under Mubarak, invited the ousted president's successors, who were much closer to Hamas than Mubarak had been, to oversee and safeguard the negotiations. He informed them that he was even prepared to meet Jabari in person if necessary. Later, Netanyahu ordered him not to meet Jabari, and the two, who spent dozens of hours during the negotiations on opposite sides of the same wall, with the Egyptians shuttling messages between them, saw each other only in a corridor.

From Israeli intelligence it emerged that there was unrest within Hamas leadership, with some arguing that the matter would have been long settled had Jabari not refused to bend. Meidan called Baskin from Egypt and said: "Get in touch urgently with Hamad and ask him if Hamas is Ahmad Jabari's private business, because with his nonsense and games he is going to jeopardize the whole deal. Ask Jabari how it is that the whole organization, including the heads of the political wing, are scared of calling him to order."

"The most difficult time," Baskin recalls, "was two weeks before the agreement." The Egyptians had placed a comprehensive draft agreement on the table, containing all the details. The Hamas representatives evaded giving an answer. "Suddenly, no one was getting back to me and all of my contacts were avoiding my calls," Baskin said. "The terrible thought crossed my mind that perhaps Hamas did not really want to sign the agreement because they could not really carry it out — that Gilad was no longer alive."

What was actually taking place was an internal dispute within Hamas. The political leadership was forcing the Egyptian proposal on Jabari, who wanted to continue stringing the Israelis along.

Ultimately, it was Israel that made the supreme compromise in agreeing to release terrorists whom it had vowed never to set free. While half of Hamas's V.I.P. list remained in prison, those who were released were collectively responsible for the deaths of 600 Israelis and for wounding thousands. Some of them had been sentenced to hundreds of years in prison. German intelligence was amazed by these concessions, which Netanyahu himself had said he would never agree to.

Now Shalit is home, and Israel can only wait to see if the gamble Netanyahu took with the country's security was justified or whether, as the deal's opponents claim, the release of so many killers will encourage even more kidnappings and fuel the flames that are perpetually smoldering in the Middle East.

To a certain extent, the entire history of Israel's prisoner exchanges prepared the country for this moment. Alongside the chronicles of regional security and Jewish tradition, it may have been a profound and bewildering sense of impotence — that Israel, with its mighty military, its legendary Mossad and its resourceful Shin Bet, is forced to stoop before its enemies — that led the masses into the streets to express their rage at the government and to demand that they bring Shalit home. It was clear that Israel would have to pay the price either way, the argument went, so why wait? Next time, said analysts firmly, a new set of clear rules would need to be devised; but this time, with Shalit languishing in jail for years without any alternative on the horizon, it must be signed before it was too late.





In 2007, a special commission was set up to determine a set of clear criteria to be followed in future prisoner exchanges. In order to protect negotiations on the Shalit deal, its details were not published, but I was told by a source in the ministry of defense that they include a warning against paying an exorbitant price to terrorist organizations in order to bring prisoners home, that the guiding principle should be bodies for bodies and small numbers of imprisoned terrorists for living hostages.

Perhaps this commission was asking Israelis to evoke an attitude that was more prevalent before the first Lebanon war of 1982 and the economic boom of the mid-'80s. It was the attitude in which one Israeli was willing to sacrifice himself for the collective, and in which the collective accepted this sacrifice. Looking back 35 years, it is undeniable that a shift has occurred in Israeli society. It is doubtful, when the time comes, that politicians will be able to resist public pressure and give up whatever is necessary, whatever percentage of the nearly 5,000 Palestinian prisoners still held in Israel, to bring the missing home.

There is perhaps some larger hope, though. After the deal went through, David Meidan reported to Netanyahu on the exchange and mentioned that he noticed a change in Jabari: he was wearing civilian clothes as opposed to the customary military uniform, appeared to be taking better care of his appearance, all of which softened his usual stern image. Meidan said to Netanyahu, "Something interesting is happening to Jabari."

He also said that he believed the Egyptian-mediated channel established between Israel and Hamas for the negotiation could perhaps be used for other deals, and that from a point of total mistrust in April, a fragile mutual trust had been built between the two parties after the Shalit deal.

Others in Israeli intelligence believe, or perhaps hope, that the fact that the deal went through may indicate that Hamas's stance is becoming more moderate, that the Arab Spring and the fall of Mubarak, with whom Israel shared a cold peace, might not pose as great a peril as Israel thought.

This fragile optimism, of course, will die immediately if one of the released prisoners takes part in the killing of Israelis, a fate that some intelligence officers say is inevitable. For now, though, the 80 percent of Israelis who supported the Shalit deal continue to rejoice. He is, as it is said there, everyone's son. And will be until more fighting claims more lives and another soldier will take Gilad Shalit's place in Israel's collective conscience.

Ronen Bergman is a political and military analyst for the Israeli newspaper Yedioth Ahronoth. He is the author of "By Any Means Necessary: Israel's Covert War for Its P.O.W.'s and M.I.A.'s."

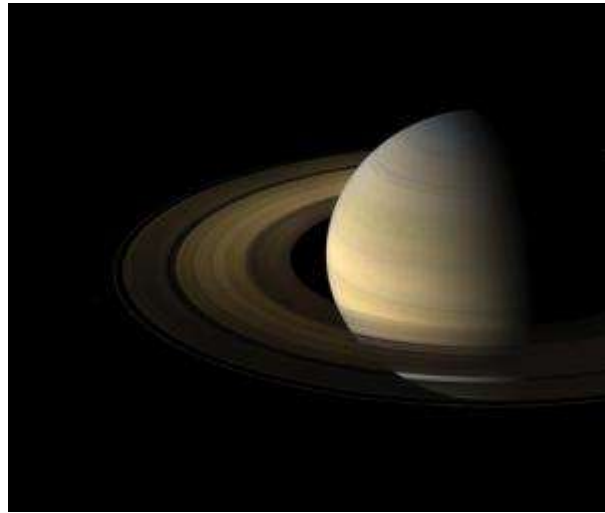
Editor: Joel Lovell

<http://www.nytimes.com/2011/11/13/magazine/gilad-shalit-and-the-cost-of-an-israeli-life.html?ref=magazine>



Boom and bust shapes Saturn's rings

- 14 November 2011 by [Lisa Grossman](#)
- Magazine issue [2838](#)



Saturn's rings are actually bumpy (Image: JPL/Space Science Institute/NASA)

SATURN'S rings are far from the serene place you might imagine. Instead, they resemble a space beltway where high-speed crashes between icy particles create and destroy snowballs the size of mountains. This constant thrum of activity could explain how moonlets emerge from the rings, and perhaps even show how planets materialise around a star.

"We used to think of the rings as a perfect, placid society where nothing ever happens," says [Larry Esposito](#) of the University of Colorado in Boulder. "Not only is that not the case - there are collisions happening all the time - but the collisions are actually throwing the rings out of equilibrium."

In 2009, Saturn's rings were aligned nearly edge-on with the sun, and the low angle of sunlight revealed that the famously flat rings are actually bumpy.

Clumps at the edges of the prominent B ring cast [dramatic shadows across the icy plane](#). "People were totally surprised by those images," Esposito says. "Nobody expected this."

Now Esposito and colleagues think they can explain the clumps, which come together and break up again over periods of hours to months.

Observations made since 2004 using the Cassini spacecraft provided the team with clues. In the B ring, the 200 to 2000-metre-wide clumps appear most often ahead of and behind the moon Mimas, whose passage carves out the ring's edge. In the more distant F ring, the clumps precede and lag behind the moon Prometheus.



This suggests that the gravity of the moons triggers the formation of the clumps. Indeed, the team's simulations show that when a moon sweeps by the edge of a ring, its gravity gives the particles in the ring a kick, driving them into one another.

Some stick together, and their gravity attracts more particles towards them, so the clumps keep growing. As a clump grows, its gravity accelerates the surrounding ring particles. And when a clump gets to be about 1 kilometre across, the particles around it are moving so fast their impacts can break up the clump.

The comings and goings of such clumps follow the mathematical rules that describe predator-prey ecology, the team has found (*Icarus*, DOI: 10.1016/j.icarus.2011.09.029). Think of the clumps as a group of rabbits whose population is held in check by the foxes that eat them, says Esposito. When the rabbit population booms, the fox population grows too. But then the foxes overhunt the rabbits, and both populations fall.

Occasionally, a clump could get big enough to retain the bulk of its mass, even after collisions, and become a moon. "Even if only once in a billion collisions do the clumps stick together and survive, those moons could persist for millions of years," Esposito says.

Saturn's rings are considered to be a laboratory for studying how planets form within the dusty discs around stars. In the same way that Mimas might seed moonlets in Saturn's B ring, a planet like Jupiter could help form smaller planets like Mars, Esposito speculates.

<http://www.newscientist.com/article/mg21228384.900-boom-and-bust-shapes-saturns-rings.html?full=true&print=true>



Ancient Stars Shed Light On the Prehistory of the Milky Way



The Milky Way is like NGC 4594 (pictured), a disc shaped spiral galaxy with around 200 billion stars. Above and below the galactic plane there is a halo, which includes older stars dating back to the galaxy's childhood billions of years ago. In principle they should all be primitive and poor in heavy elements like gold, platinum and uranium. New research shows that the explanation lies in violent jets from exploding giant stars. (Credit: Image courtesy of University of Copenhagen)

ScienceDaily (Nov. 15, 2011) — Some of Milky Way's 'stellar fossils' -- our galaxy's oldest stars -- contain abnormally large amounts of heavy elements like gold, platinum and uranium. Where these large amounts came from has been a mystery for researchers, since they are usually seen in much later generations of stars. Researchers at the Niels Bohr Institute have been studying these ancient stars for several years with ESO's giant telescopes in Chile in order to trace the origin of these heavy elements and with recent observations they have concluded how they could have been formed in the early history of the Milky Way.

The results are published in the *Astrophysical Journal Letters*.

Shortly after the Big Bang the universe was dominated by the mysterious dark matter along with hydrogen and helium. As the dark matter and gasses clumped together under their own gravity, they formed the first stars.

In the scorching interior of these stars, hydrogen and helium melted together and formed the first heavier elements like carbon, nitrogen and oxygen, and after a 'short' while (a few hundred million years) all of the known elements were in place. However, these early stars only contained a thousandth of the heavy-elements seen in the Sun today.

Every time a massive star burns out and dies in a violent explosion known as a supernova, it releases clouds of gas and newly formed elements out into space, where the gas clouds contract again and finally collapse and form new stars. In this way, the new generations of stars become richer and richer in heavy elements.

Fossils from the galaxy's childhood



It is therefore surprising to find stars from the early universe that are relatively rich in the very heaviest elements. But they exist and even right in our own galaxy, the Milky Way.

"In the outer parts of the Milky Way there are old 'stellar fossils' from our own galaxy's childhood. These old stars lie in a halo above and below the galaxy's flat disc. In a small percentage- approx. 1-2 percent of these primitive stars, you find abnormal quantities of the heaviest elements relative to iron and other 'normal' heavy elements," explains Terese Hansen, who is an astrophysicist in the research group Astrophysics and Planetary Science at the Niels Bohr Institute at the University of Copenhagen.

The research group at the Niels Bohr Institute had studied these ancient stars with ESO's giant telescopes in Chile over several years. To get a handle on the origin of the heavy elements, they followed 17 of these 'abnormal' stars for another four years with the Nordic Optical Telescope on La Palma.

Terese Hansen used her master's thesis to analyse the observations. "After slaving away on these very difficult observations for a few years I suddenly realised that three of the stars had clear orbital motions that we could define, while the rest didn't budge out of place and this was an important clue to explaining what kind of mechanism must have created the elements in the stars," explains Terese Hansen, who calculated the velocities along with researchers from the Niels Bohr Institute and Michigan State University, USA.

Gold plated gas clouds

She explains that there are two theories that can explain the early stars' overdose of heavy elements. One theory is that these stars are all close binary star systems where one star has exploded as a supernovae and has coated its companion star with a thin layer of freshly made gold, platinum, uranium and so on.

The other theory is that early supernovae (exploding giant stars) could shoot the heavy elements out in jets in different directions, so these elements would be built into some of the diffuse gas clouds that formed some of the stars we see today in the galaxy's halo.

"My observations of the motions of the stars showed that the great majority of the 17 heavy-element rich stars are in fact single. Only three (20 percent) belong to binary star systems -- this is completely normal, 20 percent of all stars belong to binary star systems. So the theory of the gold-plated neighbouring star cannot be the general explanation. The reason why some of the old stars became abnormally rich in heavy elements must therefore be that exploding supernovae sent jets out into space. In the supernova explosion the heavy elements like gold, platinum and uranium are formed and when the jets hit the surrounding gas clouds, they will be enriched with the elements and form stars that are incredibly rich in heavy elements," says Terese Hansen, who immediately after her groundbreaking results was offered a PhD grant by one of the leading European research groups in astrophysics at the University of Heidelberg.

Story Source:

The above story is reprinted from [materials](#) provided by [University of Copenhagen](#).

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/2011/11/111115095911.htm>



Aliens don't need a moon like ours

- 13 November 2011 by **David Shiga**
- Magazine issue 2838.



Adds stability, but only a little (*Image: SPL*)

TALK about being over the moon. It seems planets don't need a big satellite like Earth's in order to support life, increasing the number on which life could exist.

In 1993, Jacques Laskar of the Paris Observatory in France and colleagues showed that the moon helps stabilise the tilt of Earth's rotation axis against perturbations by Jupiter's gravity. The researchers calculated that without the moon, Jupiter's influence would make the current tilt of some 23 degrees wander chaotically between 0 and 85 degrees. That could cause huge climate swings, making it hard for life to survive, especially large, land-based organisms like us.

The result was taken by many to imply that complex life is rare in the universe, since Earth's large moon is thought to have coalesced from the debris of a freak collision between a Mars-sized planet and Earth. Less than 10 per cent of Earth-sized planets are expected to experience such a trauma, making large moons a rarity.

But a study now suggests moonless planets have been dismissed unfairly. "There could be a lot more habitable worlds out there," says Jack Lissauer of NASA's Ames Research Center in Moffett Field, California, who led the research.

The 1993 study showed that the Earth would tilt wildly without the moon because two of its motions would end up in sync, allowing Jupiter to have an outsize influence. The Earth orbits the sun on an elliptical path, and the long axis of this path shifts position over time. The Earth also wobbles like a spinning top as it rotates. Without the moon's gravitational tugs, the rate of this wobbling would be slower, matching up in just the right

way with the drifting of its elliptical orbit to magnify Jupiter's effects on Earth's spin axis, leading to big changes in tilt.

However, Laskar's study did not determine how fast these changes in tilt would occur. "The astrobiology community has taken it to mean there will be these really wild variations, and we wanted to test that," says Lissauer. He and his colleagues simulated a moonless Earth over 4 billion years, about the age of the Earth today. They found that our planet's tilt varied between only 10 and 50 degrees, a much smaller range than implied by the earlier study. There were also long stretches of up to 500 million years when the tilt was particularly stable, keeping between 17 and 32 degrees (*Icarus*, DOI: [10.1016/j.icarus.2011.10.013](https://doi.org/10.1016/j.icarus.2011.10.013)).

Much larger changes might still occur on timescales longer than 4 billion years, the team admits. But in that case they might be irrelevant for life anyway, they say, because sun-like stars burn out after 10 billion years.

Large moons are not required for a stable tilt and climate, agrees Darren Williams of Pennsylvania State University in Erie. In some circumstances, he adds, large moons can even be detrimental, depending on the arrangement of planets in a given system. "Every system is going to be different."

Jason Barnes of the University of Idaho in Moscow, who co-authored the latest study, is now leading simulations to look at how planet tilts behave in a wider variety of circumstances, including planets arranged in different ways to our solar system.

Why cold, dead moon stayed magnetic

HOW did the moon remain magnetic tens of millions of years after its molten core stopped sloshing?

Early in its life, the moon probably had a core hot enough to churn violently, with the movement of this electrically charged fluid creating a magnetic field. But as the core cooled, the convection should have eased enough to kill the field. So it was a puzzle when Apollo moon rocks suggested the moon still had a magnetic field 4.2 billion years ago, millions of years after the powerful mixing ended. Now two groups have come up with explanations for what could have kept the core stirred up.

The moon is thought to have formed closer to the Earth than it is now and spun faster, slowing down and moving away over time through tidal interactions with Earth. Christina Dwyer at the University of California, Santa Cruz, and colleagues say previous models did not take into account this faster spin, which would have agitated the molten core like water in a washing machine. This could have enabled the magnetic field to last until 2.7 billion years ago (*Nature*, DOI: [10.1038/nature10564](https://doi.org/10.1038/nature10564)).

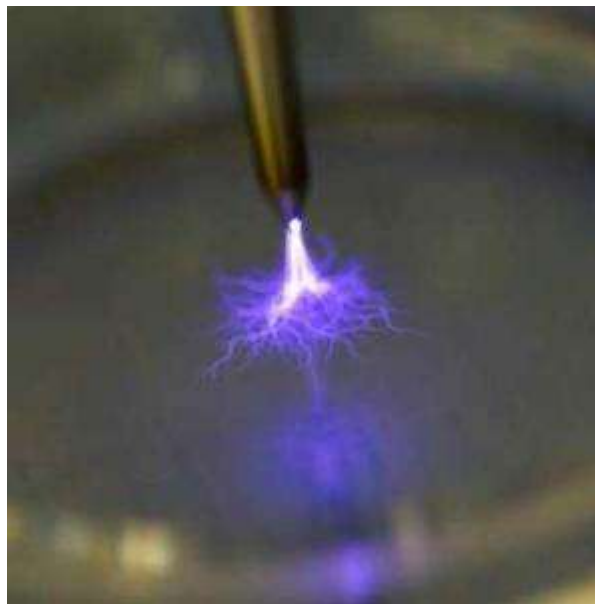
Michael Le Bars at the Non-Equilibrium Phenomena Research Institute in Marseille, France, says large meteorite impacts that occurred until about 3.9 billion years ago also could have set the lunar core sloshing for periods of 10,000 years at a time (*Nature*, DOI: [10.1038/nature10565](https://doi.org/10.1038/nature10565)).

The models might also explain how some asteroids came to be magnetised, says Ben Weiss at the Massachusetts Institute of Technology.

Melissae Fellet

<http://www.newscientist.com/article/mg21228384.600-aliens-dont-need-a-moon-like-ours.html>

Ionized Plasmas as Cheap Sterilizers for Developing World



A brief spark in air produces a low-temperature plasma of partially ionized and dissociated oxygen and nitrogen that will diffuse into nearby liquids or skin, where they can kill microbes similar to the way some drugs and immune cells kill microbes by generating similar or identical reactive chemicals. (Credit: Courtesy of Steve Graves)

ScienceDaily (Nov. 15, 2011) — University of California, Berkeley, scientists have shown that ionized plasmas like those in neon lights and plasma TVs not only can sterilize water, but make it antimicrobial -- able to kill bacteria -- for as long as a week after treatment.

Devices able to produce such plasmas are cheap, which means they could be life-savers in developing countries, disaster areas or on the battlefield where sterile water for medical use -- whether delivering babies or major surgery -- is in short supply and expensive to produce.

"We know plasmas will kill bacteria in water, but there are so many other possible applications, such as sterilizing medical instruments or enhancing wound healing," said chemical engineer David Graves, the Lam Research Distinguished Professor in Semiconductor Processing at UC Berkeley. "We could come up with a device to use in the home or in remote areas to replace bleach or surgical antibiotics."

Low-temperature plasmas as disinfectants are "an extraordinary innovation with tremendous potential to improve health treatments in developing and disaster-stricken regions," said Phillip Denny, chief administrative officer of UC Berkeley's Blum Center for Developing Economies, which helped fund Graves' research and has a mission of addressing the needs of the poor worldwide.

"One of the most difficult problems associated with medical facilities in low-resource countries is infection control," added Graves. "It is estimated that infections in these countries are a factor of three-to-five times more widespread than in the developed world."

Graves and his UC Berkeley colleagues published a paper in the November issue of the *Journal of Physics D: Applied Physics*, reporting that water treated with plasma killed essentially all the E. coli bacteria dumped in within a few hours of treatment and still killed 99.9 percent of bacteria added after it sat for seven days.



Mutant strains of *E. coli* have caused outbreaks of intestinal upset and even death when they have contaminated meat, cheese and vegetables.

Based on other experiments, Graves and colleagues at the University of Maryland in College Park reported Oct. 31 at the annual meeting of the American Vacuum Society that plasma can also "kill" dangerous proteins and lipids -- including prions, the infectious agents that cause mad cow disease -- that standard sterilization processes leave behind.

In 2009, one of Graves' collaborators from the Max Planck Institute for Extraterrestrial Physics built a device capable of safely disinfecting human skin within seconds, killing even drug-resistant bacteria.

"The field of low-temperature plasmas is booming, and this is not just hype. It's real!" Graves said.

In the study published this month, Graves and his UC Berkeley colleagues showed that plasmas generated by brief sparks in air next to a container of water turned the water about as acidic as vinegar and created a cocktail of highly reactive, ionized molecules -- molecules that have lost one or more electrons and thus are eager to react with other molecules. They identified the reactive molecules as hydrogen peroxide and various nitrates and nitrites, all well-known antimicrobials. Nitrates and nitrites have been used for millennia to cure meat, for example.

Graves was puzzled to see, however, that the water was still antimicrobial a week later, even though the peroxide and nitrite concentrations had dropped to nil. This indicated that some other reactive chemical -- perhaps a nitrate -- remained in the water to kill microbes, he said.

Plasma discharges have been used since the late 1800s to generate ozone for water purification, and some hospitals use low-pressure plasmas to generate hydrogen peroxide to decontaminate surgical instruments. Plasma devices also are used as surgical instruments to remove tissue or coagulate blood. Only recently, however, have low-temperature plasmas been used as disinfectants and for direct medical therapy, said Graves, who recently focused on medical applications of plasmas after working for more than 20 years on low-temperature plasmas of the kind used to etch semiconductors.

"I'm a chemical engineer who applies physics and chemistry to understanding plasmas," Graves said. "It's exciting to now look for ways to apply plasmas in medicine."

Graves' UC Berkeley coauthors are former post-doctoral fellow Matthew J. Traylor; graduate students Matthew J. Pavlovich and Sharmin Karim; undergraduate Pritha Hait; research associate Yukinori Sakiyama; and chemical engineer Douglas S. Clark, The Warren and Katharine Schlinger Distinguished Professor in Chemical Engineering and the chair of the Department of Chemical and Biomolecular Engineering.

The work on deactivating dangerous and persistent biological molecules was conducted with a group led by Gottlieb Oehrlein, a professor of materials science and engineering at the University of Maryland in College Park.

The research is supported by the U.S. Department of Energy's Office of Fusion Science Plasma Science Center, the UC Berkeley Blum Center for Developing Economies, and the UC Berkeley Sustainable Products and Solution Program.

Story Source:





The above story is reprinted from materials provided by **University of California - Berkeley**. The original article was written by Robert Sanders, Media Relations.

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/2011/11/111115180309.htm>



Tough astronaut bugs to blast off for Martian moon

- 10:50 08 November 2011 by [Maggie McKee](#)



(Image: Walter Myers/SPL)

A ragtag group of rugged travellers is sent on a three-year round trip to a desolate moon that might be the site of a future human outpost in space.

No, that's not a pitch for a reality show – it's a description of an experiment called LIFE (Living Interplanetary Flight Experiment) that is scheduled to set off for the larger of Mars's two moons, Phobos, on 8 November, from Baikonur, Kazakhstan.

The travellers are not celebrities, but some of Earth's toughest organisms, including the bacterium *Deinococcus radiodurans* and water bears – tiny invertebrates that can survive extreme temperatures and the vacuum of space in low-Earth orbit.

The brainchild of the non-profit Planetary Society of Pasadena, California, LIFE will pack 10 such hardy organisms inside a container the size of a hockey puck and then hitch a ride aboard Russia's Phobos-Grunt (Phobos-Soil) spacecraft.

LIFE will test an idea called transpermia, in which organisms "could be ejected off one planet in impacts, travel through space inside rocks, then be deposited on another world", says Bruce Betts, LIFE's lead scientist. Phobos-Grunt "will act as a simulated rock carrying life between planets". If the organisms survive, it would strengthen the idea that life on Earth might have come from other planets, or has travelled to other planets.

Phobos lies far beyond Earth's protective magnetosphere, so LIFE should provide a glimpse of what happens when organisms are not shielded from many of the damaging charged particles from the sun and other sources. While organisms taken to the moon on Apollo missions went beyond the magnetosphere, it was only for a few days at a time. LIFE should expose its organisms to the radiation and temperatures of space for three years.

Like a reality show, LIFE has stirred up controversy. "What happens if the mission crashes and the microbes are allowed to get loose?" asks Rocco Mancinelli, an astrobiologist at the Bay Area Environmental Research



Institute in Moffett Field, California. "Then you have potentially ruined your chances for looking at the origin of organic material or potentially life forms" on Phobos, he says.

That is essentially true for any missions studying Phobos-Grunt's landing site with on-board instruments, says Catharine Conley, NASA's planetary protection officer, who is charged with ensuring that agency projects do not contaminate other solar system bodies with terrestrial life. "It would be difficult to convince anyone that detected organics were not released from the spacecraft," she says.

For missions returning samples back to Earth for more detailed analysis, it may be possible to identify any contamination from the mission. "If one measured the isotope ratios, those would have characteristics of Earth organisms," Conley says.

And what of the risk of contaminating Mars? Fortunately, it is extremely slim, says Conley.

To cause contamination, Pascal Lee of the Mars Institute, also in Moffett Field, points out that the LIFE capsule would have to miss Phobos, survive the fiery entry into Mars's atmosphere and open up on the surface. Any organisms still living would have to survive the barrage of ultraviolet solar radiation. In desiccated, inactive states, they would not be able to reproduce.

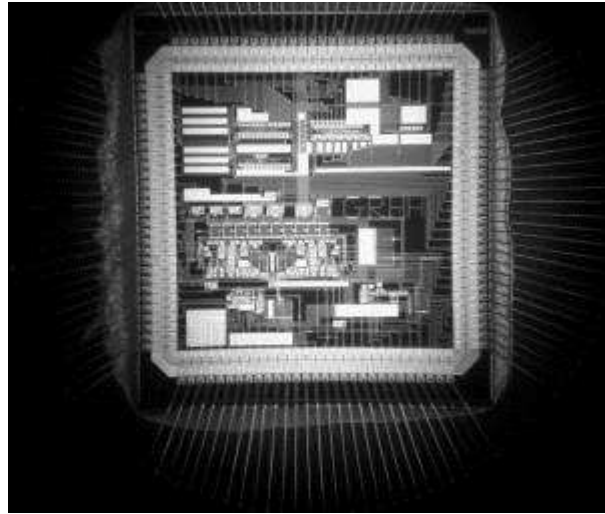
But LIFE isn't the only interesting thing about Phobos-Grunt. Assuming the spacecraft lands on the moon in February 2013, as planned, it will scoop up about 100 grams of soil to bring back to Earth in August 2014 – the first material to be brought back from a moon other than our own. The samples could help settle a burning question – are Mars's two moons, Phobos and Deimos, captured asteroids, leftover building blocks of Mars, or something else entirely?

The samples may even contain dust from Mars itself that was blasted up during an impact.

<http://www.newscientist.com/article/dn21134-tough-astronaut-bugs-to-blast-off-for-martian-moon.html>



Mimicking the Brain -- In Silicon: New Computer Chip Models How Neurons Communicate With Each Other at Synapses



Researchers have taken a major step toward that goal by designing a computer chip that mimics how the brain's neurons adapt in response to new information. (Credit: MIT)

ScienceDaily (Nov. 15, 2011) — For decades, scientists have dreamed of building computer systems that could replicate the human brain's talent for learning new tasks.

MIT researchers have now taken a major step toward that goal by designing a computer chip that mimics how the brain's neurons adapt in response to new information. This phenomenon, known as plasticity, is believed to underlie many brain functions, including learning and memory.

With about 400 transistors, the silicon chip can simulate the activity of a single brain synapse -- a connection between two neurons that allows information to flow from one to the other. The researchers anticipate this chip will help neuroscientists learn much more about how the brain works, and could also be used in neural prosthetic devices such as artificial retinas, says Chi-Sang Poon, a principal research scientist in the Harvard-MIT Division of Health Sciences and Technology.

Poon is the senior author of a paper describing the chip in the *Proceedings of the National Academy of Sciences* the week of Nov. 14. Guy Rachmuth, a former postdoc in Poon's lab, is lead author of the paper. Other authors are Mark Bear, the Picower Professor of Neuroscience at MIT, and Harel Shouval of the University of Texas Medical School.

Modeling synapses

There are about 100 billion neurons in the brain, each of which forms synapses with many other neurons. A synapse is the gap between two neurons (known as the presynaptic and postsynaptic neurons). The presynaptic neuron releases neurotransmitters, such as glutamate and GABA, which bind to receptors on the postsynaptic cell membrane, activating ion channels. Opening and closing those channels changes the cell's electrical potential. If the potential changes dramatically enough, the cell fires an electrical impulse called an action potential.



All of this synaptic activity depends on the ion channels, which control the flow of charged atoms such as sodium, potassium and calcium. Those channels are also key to two processes known as long-term potentiation (LTP) and long-term depression (LTD), which strengthen and weaken synapses, respectively.

The MIT researchers designed their computer chip so that the transistors could mimic the activity of different ion channels. While most chips operate in a binary, on/off mode, current flows through the transistors on the new brain chip in analog, not digital, fashion. A gradient of electrical potential drives current to flow through the transistors just as ions flow through ion channels in a cell.

"We can tweak the parameters of the circuit to match specific ion channels," Poon says. "We now have a way to capture each and every ionic process that's going on in a neuron."

Previously, researchers had built circuits that could simulate the firing of an action potential, but not all of the circumstances that produce the potentials. "If you really want to mimic brain function realistically, you have to do more than just spiking. You have to capture the intracellular processes that are ion channel-based," Poon says.

The new chip represents a "significant advance in the efforts to incorporate what we know about the biology of neurons and synaptic plasticity onto CMOS [complementary metal-oxide-semiconductor] chips," says Dean Buonomano, a professor of neurobiology at the University of California at Los Angeles, adding that "the level of biological realism is impressive.

The MIT researchers plan to use their chip to build systems to model specific neural functions, such as the visual processing system. Such systems could be much faster than digital computers. Even on high-capacity computer systems, it takes hours or days to simulate a simple brain circuit. With the analog chip system, the simulation is even faster than the biological system itself.

Another potential application is building chips that can interface with biological systems. This could be useful in enabling communication between neural prosthetic devices such as artificial retinas and the brain. Further down the road, these chips could also become building blocks for artificial intelligence devices, Poon says.

Debate resolved

The MIT researchers have already used their chip to propose a resolution to a longstanding debate over how LTD occurs.

One theory holds that LTD and LTP depend on the frequency of action potentials stimulated in the postsynaptic cell, while a more recent theory suggests that they depend on the timing of the action potentials' arrival at the synapse.

Both require the involvement of ion channels known as NMDA receptors, which detect postsynaptic activation. Recently, it has been theorized that both models could be unified if there were a second type of receptor involved in detecting that activity. One candidate for that second receptor is the endo-cannabinoid receptor.

Endo-cannabinoids, similar in structure to marijuana, are produced in the brain and are involved in many functions, including appetite, pain sensation and memory. Some neuroscientists had theorized that endo-cannabinoids produced in the postsynaptic cell are released into the synapse, where they activate presynaptic endo-cannabinoid receptors. If NMDA receptors are active at the same time, LTD occurs.





When the researchers included on their chip transistors that model endo-cannabinoid receptors, they were able to accurately simulate both LTD and LTP. Although previous experiments supported this theory, until now, "nobody had put all this together and demonstrated computationally that indeed this works, and this is how it works," Poon says.

Story Source:

The above story is reprinted from materials provided by **Massachusetts Institute of Technology**. The original article was written by Anne Trafton, MIT News Office.

<http://www.sciencedaily.com/releases/2011/11/111115103518.htm>





Is it time to let some species go extinct?

- 12 November 2011
- Magazine issue [2838](#)

IS IT time to let some threatened species go extinct? The heretical notion is worthy of consideration, says a majority of conservationists contacted in a poll.

Of 583 questioned, 60 per cent agreed that criteria should be established for deciding which species to abandon in order to focus on saving others (*Conservation Biology*, DOI: [10.1111/j.1523-1739.2011.01772.x](https://doi.org/10.1111/j.1523-1739.2011.01772.x)). [Murray Rudd](#) of the University of York, UK, who ran the survey, says the subject has been somewhat taboo until recently. Most large conservation organisations, he adds, already have checklists for prioritising their efforts.

We will inevitably lose species, says Jean-Christophe Vié of the [International Union for the Conservation of Nature](#) in Geneva, Switzerland. "But there will be disagreement about priorities. We can't save [all 17,000 species under threat](#), so we must choose, and that depends on many parameters."

Making that choice will not be straightforward. As Rudd puts it: "Should it be how unique a species is genetically, how useful it is economically, or whether lots of species can be saved at once?"

<http://www.newscientist.com/article/mg21228383.800-is-it-time-to-let-some-species-go-extinct.html?full=true&print=true>



The Strange Rubbing Boulders of the Atacama



These are huge boulders in Chile's Atacama desert which appear to be rubbed very smooth about their midsections, leading University of Arizona geologist Jay Quade to wonder what could cause this in a place where water, Earth's most common agent of erosion, is as almost nonexistent. (Credit: Image courtesy of Jay Quade.)

ScienceDaily (Oct. 11, 2011) — A geologist's sharp eyes and upset stomach has led to the discovery, and almost too-close encounter, with an otherworldly geological process operating in a remote corner of northern Chile's Atacama Desert.

The sour stomach belonged to University of Arizona geologist Jay Quade. It forced him and his colleagues Peter Reiners and Kendra Murray to stop their truck at a lifeless expanse of boulders which they had passed before without noticing anything unusual.

"I had just crawled underneath the truck to get out of the sun," Quade said. The others had hiked off to look around, as geologists tend to do. That's when Quade noticed something very unusual about the half-ton to 8-ton boulders near the truck: they appeared to be rubbed very smooth about their midsections. What could cause this in a place where Earth's most common agent of erosion -- water -- is as almost nonexistent?

About the only thing that came to mind was earthquakes, said Quade. Over the approximately two million years that these rocks have been sitting on their sandy plain perhaps they were jostled by seismic waves. They caused them gradually grind against each other and smooth their sides. It made sense, but Quade never thought he'd be able to prove it.



Then, on another trip to the Atacama, Quade was standing on one of these boulders, pondering their histories when a 5.3 magnitude earthquake struck. The whole landscape started moving and the sound of the grinding of rocks was loud and clear.

"It was this tremendous sound, like the chattering of thousands of little hammers," Quade said. He'd probably have made a lot more observations about the minute-long event, except he was a bit preoccupied by the boulder he was standing on, which he had to ride like a surfboard. "The one I was on rolled like a top and bounced off another boulder. I was afraid I would fall off and get crushed."

He managed to stay atop his boulder, of course, and became thoroughly convinced that the earlier hypothesis about the boulders was correct.

"I was just astonished when this earthquake came along and showed us how it worked," Quade said. Quade is explaining the phenomenon at the annual meeting of the Geological Society of America in Minneapolis.

The whole story appears to be that the boulders tumbled down from the hills above -- probably dislodged by earthquakes. They accumulated on the sand flat, with no place else to go. Quade compares the situation to a train station where people are crowded together closely, rubbing shoulders as they waiting for a train. In this case the boulders have been stuck at the station for hundreds of millennia and the train never comes. So they just get more crowded and rub shoulders more over time.

Analyses of the boulder top surfaces suggest that they have been there one to two million years. That age, combined with the fact that seismic activity in the area generates a quake like that Quade witnessed on the average of once every four months, suggests that the average boulder has experienced 50,000 to 100,000 hours of bumping and grinding while waiting for that nonexistent train.

"It also answers a mystery that had been eating at me for years: How do the boulders get transported off the hills when there is so little rain," Quade said. "How do you erode a landscape that is rainless?"

Again the answer is seismic activity.

"It raises the question in my mind of other planets like Mars." If there is seismic activity, even from meteor impacts, might it also be creating similar landscapes? "I would predict that these kinds of crowds of boulders might be found on Mars as well, if people look for them."

Story Source:

The above story is reprinted from materials provided by **Geological Society of America**.

<http://www.sciencedaily.com/releases/2011/10/111011112457.htm>



Artificial intelligence joins the fossil hunt

- 08 November 2011 by **Jeff Hecht**
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It must be here somewhere (*Image: Richard Austin/Rex Features*)

THE traditional image of the fossil-hunting palaeontologist - traipsing across parched badlands armed with nothing but hand tools and a sharp eye - may be in for an overhaul. Artificially intelligent software that scans satellite images of potential dig sites could greatly increase the number of fossils unearthed.

Success in finding bones boils down to a lot of luck, says Robert Anemone of Western Michigan University in Kalamazoo, who once blundered into "the best locality we ever found" - a cache of early primate bones from between 40 and 50 million years ago - after making a wrong turn during a trip in the Great Divide basin of south-western Wyoming.

He and Glenn Conroy, a palaeoanthropologist at Washington University in St Louis, Missouri, wanted to improve the odds of success. "We thought 'there's got to be a better way'," Anemone says. "We started talking about making a predictive model of where one might find fossils."

Their model uses computer learning systems called neural networks to spot promising fossil sites from satellite data.

Such software must first be taught what to look for. So the team began by feeding the software a list of known locations in the 10,000-square-kilometre Great Divide basin, labelling them either as being fossil-rich or belonging to one of four other categories - barren, forest, scrub or wetland. Rather than telling the system what to look for to identify each type of location, they had it analyse six bands of visible and infrared light recorded by the Landsat 7 satellite and come up with its own identifying marks.



Next the software sorted unknown areas of the basin into the five categories. On the first pass the computer found "a huge portion of the basin was similar to what we had always found to be productive locations", says team member Jay Emerson, also at Western Michigan University. Using only the satellite data, the computer had learned that the area's fossil sites were in sandstone - but not all sandstone has fossils at the surface.

To distinguish fossil-rich sandstone, the team added two other geological requirements to the software. The rocks had to be 50 million years old, as that is the age of the primates they study, and the land had to be sloped by at least 5 degrees, so erosion was likely to have exposed fossils. They also modified the computer model to account for the 15-metre resolution of the satellite data, which meant that pixels often spanned more than one type of surface.

To assess their software, the team compared model predictions with the characteristics of other known locations they had not fed into the computer. It correctly identified 79 per cent of the known fossil sites as likely to contain fossils, and correctly classified 84 per cent of all the other locations, Emerson says. Anemone will present the team's work at the Society for Vertebrate Paleontology meeting in Las Vegas, Nevada, this week.

The acid test will come next summer, when Anemone and Conroy plan to visit previously unexplored sites that the model predicts could be rich in fossils. "There are three or four parts of the basin that we will look at; nobody would be likely to go there otherwise," says Anemone. Once on the ground, the pair will again use their trustiest fossil-hunting tool - their eyes. Identifying bones from among rocks in an outcrop is something robots are not yet ready for, Anemone says.

However, Emerson says that high-resolution images from an aircraft flying 1.5 kilometres above the Earth could give 15-centimetre resolution. That's good enough to pick out the most promising spots on a large outcrop, which could save bone-hunters days of trekking as they comb large rock formations.

Palaeontologists already use aerial and satellite images to plan fieldwork. This would be "a more sophisticated way of doing something we've done for a long time", says palaeontologist Peter Dodson of the University of Pennsylvania in Philadelphia, who was not involved in the work. "Anything that helps palaeontologists is all to the good."

<http://www.newscientist.com/article/mg21228376.000-artificial-intelligence-joins-the-fossil-hunt.html?full=true&print=true>



Born to Roar: Lions' and Tigers' Fearsome Roars Are Due to Their Unusual Vocal Cords



An Amur or Siberian tiger roars, producing what is known as a long-distance advertisement call. A new study of vocal folds from six tigers and lions shows that the frequency of their roars is determined by the shape of their vocal folds and by the ability of their vocal folds to stretch and shear, not by nerve impulses from the brain. The study was performed by scientists from the National Center for Voice and Speech at the University of Utah and University of Iowa, and the Boys Town National Research Hospital in Omaha. (Credit: Edward J. Walsh, Boys Town National Research Hospital.)

ScienceDaily (Nov. 2, 2011) — When lions and tigers roar loudly and deeply -- terrifying every creature within earshot -- they are somewhat like human babies crying for attention, although their voices are much deeper.

So says the senior author of a new study that shows lions' and tigers' loud, low-frequency roars are predetermined by physical properties of their vocal fold tissue -- namely, the ability to stretch and shear -- and not by nerve impulses from the brain.

"Roaring is similar to what a baby sounds like when it cries," says speech scientist Ingo Titze, executive director of the National Center for Voice and Speech, which is administered by the University of Utah. "In some ways, the lion is a large replica of a crying baby, loud and noisy, but at very low pitch."

The study of lion and tiger vocal folds and how they produce roaring -- vocalizations used by big cats to claim their territory -- was set for publication on Nov. 2, in the Public Library of Science's online journal *PLoS ONE*.

While the comparison was not part of the study, Titze says a baby "cries to have people come to help it. The lion uses similar attention-getting sound, but mainly to say, 'I am here, this is my territory, get out of here.'"

"In both cases, we hear loud, grating sounds that grab people's ears. When a baby cries, the sound isn't pretty. The sound is basically rough. The vibration isn't regular."

The same is true of roars by lions and tigers, and, like babies, their vocal folds (commonly called vocal cords) are "very loose and gel-like" and vibrate irregularly to make roars sound rough, Titze says. The main difference: Babies cry at a high-pitched frequency, while big cats have a low-frequency roar.

Roaring Frequency Dictated by Structure of Vocal Folds

The new study's key finding is that lions and tigers can roar loudly and deeply because their vocal folds have a flat, square shape and can withstand strong stretching and shearing. That contradicts a theory that lions roar deeply because the vocal folds are heavy with fat.

Instead, the fat helps give the vocal folds their square shape where they protrude into the airway, unlike triangular vocal folds in most species. The fat also may cushion the vocal folds and provide repair material when they are damaged, the researchers say.

"We were trying to correct a previous assumption that lions and tigers roar at low fundamental frequencies because they have a huge vocal folds," says study co-author Tobias Riede, a research assistant professor of biology at the University of Utah and a research associate at the National Center for Voice and Speech.

"It's true they have large vocal folds, but the shape and the viscoelastic properties [tension and shearing strength] make the roars so loud and deep," he says.

Riede says the scientists "set out to find out the relationship between structure of the vocal folds and how they work to produce the roar in lions and tigers. We tested if the mechanical properties of the vocal folds allowed us to make predictions about the sound."

They did. Measurements of vocal fold resistance to stretching and shearing let researchers accurately predict the "fundamental frequency" ranges at which lions and tigers are known to roar, and the lung pressures needed to produce those roars.

Titze and Riede conducted the research with first author Sarah Klemuk, an adjunct assistant professor of communication sciences at the University of Iowa; and Edward Walsh, director of auditory physiology at Boys Town National Research Hospital in Omaha, Neb. Titze is on the faculty at the University of Iowa and University of Utah, where he is a research professor of otolaryngology and medicinal chemistry. The research was funded by the National Institutes of Health and the National Science Foundation.

"We study a lot of animals -- deer, elk, dogs and cats," Riede says. "Lions and tigers are just interesting examples for very loud and low-frequency vocalization."

These studies have a practical aspect. "If you understand how vocal folds are structured and what effects that structure has on vocal production, then it could help doctors make decisions on how to reconstruct damaged vocal fold tissue" in people such as cancer patients, singers, teachers, coaches and drill sergeants, he says.

Voices of Big Cats

The new study analyzed vocal folds from within the larynx, commonly known as the voice box. Larynges were excised from three lions and three tigers euthanized for humane reasons due to advanced disease at the Henry Doorly Zoo in Omaha. They ranged from 15 to 22.4 years old at death. The three lions were females. The tigers were female Sumatran and Bengal tigers and a male Amur (Siberian) tiger.

Vocalization is complex, and involves factors not included in the new study of vocal folds: how air is pushed from the lungs, how sound resonates in the vocal tract, how the tongue and jaw move, and movement of muscles and cartilage of the larynx.

The study included examinations of vocal fold tissue, which is soft connective tissue in the form of elastin, collagen, a lubricant known as hyaluronan, and fat.



Lions and tigers have large vocal folds: about 1 inch high from top to bottom, 1 inch thick side to side and 1.5 inches long front to back. They protrude from the larynx into the airway just above the trachea, forming a triangular shape on each side of the airway in most species but a squared shape in lions and tigers.

Scientists already knew lions and tigers have significant fat within their vocal folds. The new study showed that in big cats, this fat is located deep within the vocal fold ligament, and helps give the folds their flattened, square shape.

That shape "makes it easier for the tissue to respond to the passing airflow," allowing louder roars at less lung pressure, Riede says.

When air moves past the vocal folds to make sound, the folds vibrate side to side and up and down, stretching and shearing the folds -- properties the researchers tested.

First, they attached lion and tiger vocal folds to levers that measured force and distance as the tissue was stretched "like the strings of guitar," says Riede.

Next, the researchers put small circular disks of vocal fold tissue between plates and twisted one plate by a few degrees, slowly and quickly, while measuring the force needed to do that. That shows how well the material withstood shearing during roaring.

The scientists then used these measurements of tension and shear strength of big cat vocal folds to predict the lung pressures and "fundamental frequency" range at which the animals roar -- the range of rates at which the vocal folds are able to vibrate.

They came up with 10 to 430 hertz, or cycles per second, which is consistent with known roaring frequencies of 40 to 200 hertz in lions and 83 to 246 hertz in tigers, Riede says. Men speak at 100 to 120 hertz and women at a higher 200 to 250 hertz, but big cats are much louder because they more efficiently convert lung pressure into acoustic energy.

It makes sense that lions' and tigers' frequency when roaring is a function of the mechanical properties of their vocal folds, not the mass or weight. After all, elk have similarly sized vocal folds, yet they have a high-pitch bugle not a low roar, Titze says.

"It is confirmation that the frequencies of phonation are described by mechanical properties of the vocal folds and not by nerve impulses from the brain," he adds.

A lion's or tiger's roar can reach 114 decibels to someone standing a few feet away, which "is about 25 times as loud as a gas lawn mower," Titze says. And roars aren't delivered one at a time; instead, lions roar about 50 times in 90-second bouts.

"They roar with a sound that is frightening to people because it has this rough and raw quality," Titze says. "Lions and tigers are deemed the kings of the beasts, partly because of their roars. Imagine if they sang beautiful tunes and they were very low-frequency tunes. Who's going to be afraid of that?"

Story Source:





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

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1. Sarah A. Klemuk, Tobias Riede, Edward J. Walsh, Ingo R. Titze. **Adapted to Roar: Functional Morphology of Tiger and Lion Vocal Folds.** *PLoS ONE*, 2011; 6 (11): e27029 DOI: [10.1371/journal.pone.0027029](https://doi.org/10.1371/journal.pone.0027029)

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