Infoteca's E-Journal

An Electronic Compilation of Scientific and Cultural Information by
Sistema de Infotecas Centrales, Universidad Autónoma de Coahuila

CONTENTS

Do we need a literary canon?
by Richard Jenkyns
Jonathan Sacks is right that we need a common culture, but wrong to think it should be based on a canon. Forcing young people to read the Bible won't foster a sense of belonging. Shared references must evolve more organically
Richard Jenkyns is professor of the classical tradition at Oxford University and author of Westminster Abbey

The chief rabbi, Jonathan Sacks, recently wrote: "Until recently, national cultures were predicated on the idea of a canon, a set of texts that everyone knew. In the case of Britain they included the Bible, Shakespeare and the great novels. The existence of a canon is essential to a culture. It means that people share a set of references and resonances, a public vocabulary of narratives and discourse." This shared inheritance, he argues, is now being destroyed by multiculturalism and technology, satellite television and the internet in particular. But what is a canon? Do we need one? Are we suffering from "canon anxiety"? And if so, why?

The idea of a canon has a religious origin. The early church had to decide which of its texts were sacred scripture and which were not. The decision was a straight yes or no: either a book was in or it was out. There might be debates about particular texts—the Book of Esther and the second Epistle of Peter, for example, were long in doubt—but once the decision was made, it was clear-cut. Books outside the canon might be morally admirable, but only the canon had the necessary salvific power.

This religious notion in due course blended with another drawn from secular culture: the idea of genius. The idea that great poets and musicians are men apart is itself very ancient. At first the thought was that these special people received inspiration from outside themselves, from a god or muse. Later, genius was seen as a quality innate in the artist. Kenneth Clark declared his credo in Civilisation: he believed in God-given genius. Since he appeared not to believe in God, this was not wholly logical, but the belief was emotionally compelling enough to override strict reason. Again, the idea is an absolute one: genius is something very distinct, and a creative artist has either got it or he has not. The same thing seems to be implied by the title of a new survey of classic works from Homer to Goethe, The Great Books (Icon), by the philosopher Anthony O'Hear. One notices the definite article: it is as though the great books form a clearly determinate class.

For all its emotional appeal, this idea looks unlikely in the cold light of reason: it seems more plausible to suppose a more or less continuous spectrum of creative ability than a sharp division between genius and the rest. But if this is so, we may wonder why we are so drawn to the notions of genius and canon. The answer may lie in our need for heroes.

Here the particular situation in which we find ourselves at the start of the 21st century comes into play. We live in a world without heroes. The one exception is Nelson Mandela, and his canonisation testifies to the void which he helps to fill. The middle of the last century saw men such as Churchill, Mao and De Gaulle who, for better or worse, were big figures. Two decades ago there were leaders like Thatcher, Gorbachev and again Mandela. Today, on the other hand, it appears that not one of the nearly 200 nations of the world is led by a person of truly exceptional quality. Perhaps we are fortunate to live in an age that calls for technocrats rather than titans, but something has been lost.

We lack cultural heroes, too. Isaiah Berlin used to say in his last years that there were no geniuses left in the world: no great novelists, poets, painters or composers. That judgement may or may not be true, but it surely expresses a general perception. On the surface there is a good deal of chatter about young British artists or brilliant novelists and filmmakers, but deep down we feel that nothing very large is coming to birth. Architecture is the main counter-example: Santiago Calatrava seems to me clearly a genius, Frank Gehry may be, and perhaps there are others. But architects are less crushed by the burden of the past than artists in other fields: modern technology opens up to them forms of expressive possibility unknown to earlier generations. Writers and painters do not share this advantage. I remember in the 1970s a distinguished person passing the Listener to me and saying, about The Old Fools, "There is a poem that will last for 500 years": it was Philip Larkin's latest. It is a sentence that one cannot easily imagine being spoken today. The present standard of musical performance, by contrast, is astonishingly high, but it is significant, again, that the best interpreters of our time receive the kind of veneration that used to go to composers: it reveals an absence.

In earlier ages, there were men who were recognised by their contemporaries as among the supreme imaginations of all time. The people who first entered Chartres Cathedral or looked up at the ceiling of the Sistine chapel or heard Beethoven's 9th knew that they were at the birth of creations that equalled and perhaps surpassed anything of their kind that had gone before. That is not an experience that has been available to anyone in the last 100 years. (There is one 20th-century megastar, Albert Einstein, but he is not an artist.) None the less, modernism was a mighty creative force, and 50 years ago people still felt that there were giants upon the earth: Picasso, Stravinsky, Eliot, Le Corbusier. Perhaps not all these reputations will stand the test of time, but the question is one of perception. Our age lacks living cultural heroes, and it should be no surprise if this leads some commentators to lay more weight on our inheritance from the past—that is, on the canon.

Another reason for canon anxiety may be a feeling that the political and media elite have either lost interest or lost their nerve. Here the official attitude is curiously double. On the one hand, everyone pays lip service to the value of the arts: perhaps surprisingly, the sturdy, no-nonsense voice declaring that spending on culture is a waste of honest workers' money is no longer heard. On the other hand, government makes the case for the arts only in terms of economic advantage and social utility narrowly conceived. Beauty and glory are not terms in the political vocabulary. And not only are our politicians reluctant to defend the value of the arts for their own sake, they seem actively to avoid showing an interest in them. It is difficult to know whether this is a local British phenomenon or a wider characteristic of our world, and if it is local, how much it is the result of the particular natures of a few people who happen to have been at the top in recent years. (Ever since the death of Prince Albert, the royal family, with the notable exception of Prince Charles, have been notoriously uninterested in the arts, despite the excellent educations which the younger among them have received: it will be a glad day when William and Kate are snapped leaving the Wigmore Hall.)

That photograph of one of the Gallagher brothers in 10 Downing Street regarding an adulatory prime minister with amused contempt expresses the ethos of our age in more ways than Tony Blair intended. None the less, the invitation itself was a matter of deliberate policy: the message was that pop music was what mattered and Brendel could wait. But the Blairs' indifference to culture, somewhat surprising in well-educated professionals of their generation, does seem to have been perfectly sincere, and it is apparently shared by David Cameron. When he was standing for the leadership of his party, he allowed a gadfly television journalist to follow him around, pestering him with questions about pop groups, which he answered with easy authority. It was not always thus. The high culture enjoyed (or affected) by the Kennedys was part of their glamour, and Ted Heath felt no need to conceal his passion for classical music. Churchill and De Gaulle both saw themselves as literary artists, and Churchill painted too.

The present tone of politics has created the suspicion, justified or not, that there has been a trahison des clercs: that whatever they say, at heart our governors are anti-intellectual. That is evidently O'Hear's belief: he protests about a system of education that "deprives ourselves and our children of the ability to read classic authors and the opportunity to love them." The chief rabbi, for his part, is more concerned with the coherence of society and the place of ethnic and religious minorities within it. However, his argument connects at least two and probably three different things, which may be related but which are in principle separate. The first is the importance of shared experience—he is explicitly attacking multiculturalism. The second is the importance of high culture. Significantly, the examples Sacks gives of texts which everyone once knew are Shakespeare and the Bible—with which, as we know, every decent desert island is equipped—and the great novels. The great novels, note; by implication, a shared experience of Agatha Christie or Ian Fleming will not do the trick. And Sacks may also be hinting at a third idea: that it is important for us to understand where we have come from, to know the texts which have formed the beliefs and behaviour of the world in which we live. If we know nothing about the past, or even if we know only about the recent past, we are fated to misunderstand the present. This is certainly part of O'Hear's case: "We are cutting ourselves and our descendants off from our cultural roots," he has said. "It is an unforgivable form of intellectual and spiritual suicide."

It is easy to make exaggerated claims about the canon. Take Don Quixote—as it happens, the one among O'Hear's great books that I have not read (well, have you?). That may be my loss aesthetically, but I doubt whether it has wounded me in any larger way. We all know about the dotty knight and Sancho Panza and the tilting against windmills (curious how the famous parts of that very long book come so near the beginning), but we have learnt this indirectly, and it is surely debatable whether reading Don Quixote is essential to a deep understanding of our culture. None the less, O'Hear is right. The greatest loss, of course, has been knowledge of the Bible: it is not rare these days to find professors of English literature missing allusions that humble people would have picked up 150 years ago. The literature of Greece and Rome, too, remains or ought to remain essential to us, not only for its intrinsic quality but for the ways in which it has helped to shape our own world, from the middle ages onward.

Sacks is right, in turn, to say that a society needs shared references and resonances, but there is no inherent reason for these to be high cultural ones. It is surely vain to suppose that poorly educated and disaffected young Asians can be brought to a stronger sense of belonging in Britain by a diet of Hamlet, Middlemarch and the Psalms. The truth is that shared references and resonances mostly need to evolve naturally, that most of them derive from popular culture, and that many of them are like family jokes. Television has had enormous power as a unifier; this power is now declining with the proliferation of channels and new media, but in their time Morecambe and Wise did more than Milton and Wordsworth to make us feel one people.

To understand how a canon is formed and how it can be socially useful, we might look to another kind of canonisation, that of individual men and women. The earliest and most durable saints were not created by the Pope: they were canonised by a process in which church and people somehow shared. Similarly, it is an obscure collaboration between the clerisy and the people that has canonised the great writers.

Consider the most striking literary canonisation of our times. Jane Austen has always been esteemed, and FR Leavis sanctified her as one of the bearers of the "great tradition," a sort of doctor of his secular church. But in the past 15 years she has turned into the English novelist, an inescapable part of the public consciousness, more universally present than any other writer bar Shakespeare. Some people think she owes her current prominence to popular fantasies of tight breeches and bosoms heaving beneath empire-line dresses. This does not seem likely: if that is what people want, they can get it more readily from Georgette Heyer. Another view is that she has benefited from nostalgia for a safer, quieter and more decorous world; but the idea that the world of her novels is cosy and comfortable can hardly survive the reading of them. Most of her modern popularity is the result of her actual merits, and in a broad sense the highbrows and the lower-middlebrows are admiring the same things: well-made plots, perceptive depiction of character and the acute study of social interaction. It is a genuine popular canonisation. Or take Larkin, again, the last poet to have entered naturally into the general consciousness: people came to find that his words, his lines, his distinctive way of seeing and feeling had become part of the furniture of their minds, part of the common inheritance.

Does this mean that we can do nothing about our cultural condition? Must we just leave things to take their course? Not entirely. There is a good deal we can do about the way in which we teach literature, though here there is a nice balance to be found between drawing the young in through the works that may most naturally appeal to them and stretching them with works that may seem less attractive. We should also teach the development of a personal taste: the risk in stressing the canon too much is that it can seem to require that we dwell always on the upper slopes of Parnassus, and that we should always like what we have been told to like; yet without personal predilection, there is no true cultivation.

The political class should proclaim the value of culture for its own sake. Those of them who have cultural enthusiasms should bring them out of the closet, and the rest might at least pretend. This would be the right thing to do, and I doubt that it would lose votes. People do not, in the end, want their leaders to be exactly like themselves, and whatever they say, there is plenty of evidence that the public still likes a gent. All of us, politicians included, should cease to search for a "highest common factor" culture, and instead affirm that our culture is grounded in a distinct history: in Christianity and the Bible, Greek and Roman antiquity, the Renaissance, the Reformation and the Enlightenment.

The chief rabbi is right to say that multiculturalism has been a disaster. For one thing, it is actually monocultural: it is the demand that all countries should be like America (though without America's devotion to nation and constitution). For another, it inhibits the robust and confident expression of the majority culture, although such robustness and confidence provide the best conditions for minority cultures also to flourish. The millennium dome has been so ridiculed that it may seem cheap to drag it up again, but its utter vacuity has been instructive. It would have been more popular and enjoyable, as well as more worthwhile, if it had celebrated high culture, taken pleasure in our history, and not tried to conceal whose two-thousandth anniversary was actually being marked. We should indeed assert the importance of historical memory, of ancestry and rootedness. This is something which immigrants do not share, but the answer is not to pretend that it does not matter, but to offer new citizens a kind of historical memory by proxy. That is more or less what happens in the US.

Meanwhile, television could do with a stiff dose of Reithianism (radio is in better condition). Cultural programming on the main channels is now usually a feeble mixture of cringing and condescension, and we have even seen the rise of the professional ignoramus—the presenter chosen because he lacks knowledge of the subject and can play the role of innocent abroad. The political world and the media alike seem to treat the public with an unpleasing blend of obsequiousness and contempt. Why not try flattering them instead? It should be the aim of public policy to change the tone. If we could do that, the canon could perhaps be left to look after itself.

http://www.prospect-magazine.co.uk/article_details.php?id=9895

Testing Fails the Arts
by Richard Kessler
26 Nov 2007

As New York City public schools begin to receive new funds from the state as part of the agreement in the long-standing Campaign for Fiscal Equity lawsuit, schools will undoubtedly face enormous pressure to improve scores on standardized tests. This is understandable, but should not come at the expense of social studies, foreign languages, physical education -- and the arts. All of these make for a well-rounded education but are not measured on standardized tests.

While the "Contracts for Excellence" recently agreed to with the state forgo the funding for additional standardized tests that the Bloomberg administration had sought, the bulk of the funds -- $442 million -- are not governed by these agreements. And the $248 million that they represent is a very small part of the city's $19 billion budget for public schools.

The Department of Education had to come to terms with the governor and so earmark funds to reduce class size and improve training for teachers and principals. Similarly, one would hope that decision-makers will also begin to rethink the emphasis placed on standardized testing in reading and math.

While the drive toward accountability and the focus on reporting is well intentioned, the over-reliance on standardizing testing has been met with growing public criticism. In fact, the recently released Department of Education Progress Reports and their assigned letter grades to schools, have left many parents and school communities scratching their heads, while others are just plain angry. (See related story)

An 'Incomplete' for the Report Cards

What strikes many observers is how narrow the reporting scheme for the Progress Reports developed by the Department of Education is. The major portion of a school's score, 85 percent, came down to how well students did on two standardized tests, the state math and English language arts multiple-choice exams. While these are indeed very important measures, relying too heavily on them and penalizing those schools and principals that receive failing grades, ultimately cheats our students and our city. What is more, many people fail to understand the relationship between the Progress Reports and Quality Reviews issued for each school, the latter of which consider a much wider array of data.

While both the Department of Education and the federal government identify the arts as vital to a good education, the grades -- and the standardized testing approach -- fail to acknowledge the central role subjects beyond reading and math play in a child's education. Arts education may very well be the "incomplete" in these report cards.

After the recent release of the Progress Reports, a vice principal at I.S. 318 told the New York Sun that his school would not give in to the pressure to up its "grade" from a B to an A. "We … care about the test, but not enough to sacrifice … art, music, chess, robotics - just to make sure they get a better or equal score than they got the year before," he said. More test prep, according to the principal, would leave students bored, not stronger learners.

What this administrator understands is that test prep, often called "drill and kill," has its limits. Parents know it too. They want a well-rounded education for their children, and that may be why some send their children to private schools or flee the city to enroll their children in suburban schools.

The Importance of the Arts

Multiple studies show that learning in the arts enhances learning in other subject areas and contributes to a student's overall development. In addition to the skills taught in the individual arts disciplines -- visual art, dance, music and drama -- the arts provide students with unique opportunities to work collaboratively, to develop creative and critical thinking skills, to solve problems and develop innovative solutions -- all 21st century skills that employers in New York City and around the world want.

In fact, a national poll released in early November by Harris Interactive, an independent research company, showed that 83 percent of people earning $150,000 or more had a music education.

In New York City, arguably the arts capital of the world, the arts in our public schools have only recently begun to recover from the devastating budget cuts of the 1970s. The scarce data that exists indicates that more New York City public school students have access to arts education now than they did 25 years ago. In 1991, only one-third of the schools indicated having at least one arts specialist, but in 2006, according to a Department of Education study, two thirds of the schools reported having at least one full or part-time arts specialist. Evidence also indicates that school partnerships with cultural organizations have expanded, although children living outside of Manhattan are half as likely to go to a school with such a partnership as those in Manhattan.

There is still, however, a long way to go to restoring arts education for all of New York's 1.1 million public school students. According to the Department of Education's parent survey for the 2006-2007 school year, 41 percent of parents surveyed say their children receive zero arts education. A 2006 department study found that hundreds of schools did not have a single certified arts teacher. Other studies have indicated that, even in schools where arts are offered, only a fraction of the students receive the instruction.

Recognizing the value of arts, New York State in 1996 developed a minimum set of state requirements that, if adhered to, would be an improvement on the current instruction in the arts. The city has also developed a "Blueprint for Teaching and Learning in the Arts" that emphasizes arts instruction. However, it is no secret that principals and teachers are feeling the squeeze to sacrifice the elements of an education that do not directly relate to what appears on standardized tests.

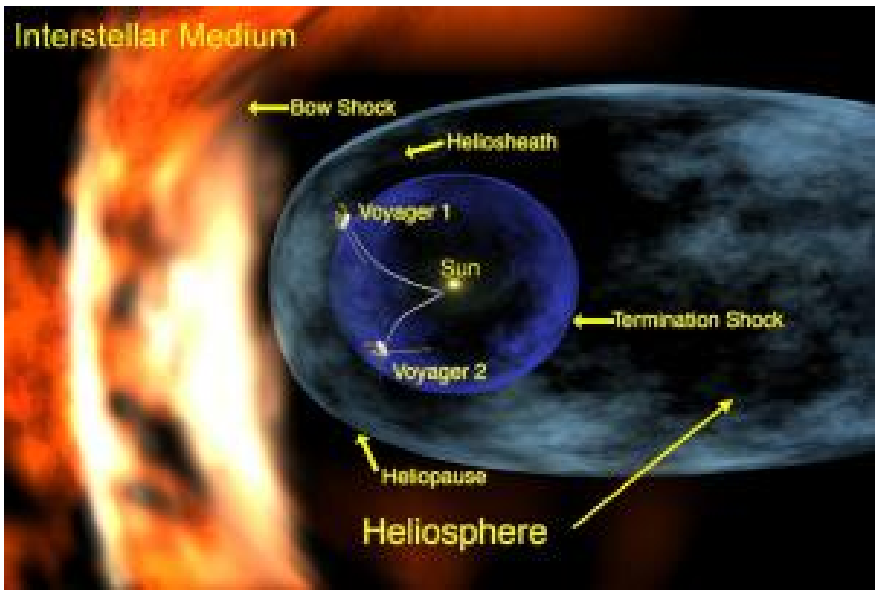
The Department of Education has also launched ArtsCount, with a focus on holding principals accountable for meeting the minimum state requirements in arts education. It is not at all clear how ArtsCount, which is separate from the well-publicized school report cards, will ensure that every child receives the minimum arts education required by New York State. Moreover, many people remain skeptical of the department. The school system has, after all, eliminated Project Arts, the only real guarantee, a financial guarantee, that no matter what else happened, there would be funding for arts education for every single child in every public school.

In this age of high stakes testing and accountability, a focus on the arts is more important than ever. Fortunately, New York State has set minimum state requirements that all public schools across the state must meet for the arts. However, this minimum is little more than a starting point, as all it requires in the critical middle and high school years is a total of two years of arts. As a matter of equity and of access, the city should redouble efforts to ensure that all New York City public schools at the very minimum meet these requirements and provide a high quality well-rounded education to every child in the city.

Richard Kessler is the executive director of the Center for Arts Education, a not-for-profit organization committed to restoring, stimulating, and sustaining quality arts education as an essential part of every child's education.

Gotham Gazette - http://www.gothamgazette.com/article//20071126/202/2355

Voyager 2 Spacecraft Set to Reach Space Milestone



A computer simulation by a physicist predicts the Voyager 2 spacecraft will reach a major milestone in space in late 2007 or early 2008. (Credit: NASA/Walt Feimer)

ScienceDaily (Nov. 28, 2007) — Using a computer model simulation, Haruichi Washimi, a physicist at UC Riverside, has predicted when the interplanetary spacecraft Voyager 2 will cross the "termination shock," the spherical shell around the solar system that marks where the solar wind slows down to subsonic speed.

According to Washimi's simulations, the spacecraft is set to cross the termination shock in late 2007-early 2008. To make this forecast, Washimi and his colleagues used data from Voyager 2 and performed a global "magneto-hydrodynamic simulation" -- a method that allows for precise and quantitative predictions of geomagnetic disturbances caused by solar activities.

Because Voyager 2's crossing of the shock is expected to be an abrupt and relatively brief event, scientists are working to ensure that the most is made of the opportunity. With an idea of when the spacecraft will cross the shock, they are better able to maximize coverage of the crossing.

"Washimi's model has predicted the location of a boundary that is approximately 90 times farther from the sun than is the Earth, to within a few percent," said Gary Zank, the director of the Institute of Geophysics and Planetary Physics and one of the coauthors of the research paper. "This is truly remarkable given the enormous complexity of the physics involved, the temporal and spatial scales involved, and the variability of the solar wind conditions."

The solar wind -- a stream of charged particles ejected by the sun in all directions -- travels at supersonic speeds when it leaves the sun, until it eventually encounters the interstellar medium made up of plasma, neutral gas and dust.

At the termination shock, located at 7-8.5 billion miles from the sun, the solar wind is decelerated to less than the speed of sound. The boundary of the termination shock is not fixed, however, but wobbly, fluctuating in both time and distance from the sun, depending on solar activity.

"This is the first time the termination-shock position has been forecast in this way," said Washimi, the lead author of the research paper and a scientist at the Institute of Geophysics and Planetary Physics. "After it crosses this boundary, Voyager 2 will be in the outer heliosphere beyond which lies the interstellar medium and galactic space. Our simulations also show that the spacecraft will cross the termination shock again in the middle of 2008. This will happen because of the back and forth movement of the termination-shock boundary. This means Voyager 2 will experience multiple crossings of the termination shock. These crossings will come to an end after the spacecraft escapes into galactic space."

Voyager 2 was launched Aug. 20, 1977. It visited four planets and their moons in the course of its journey into space. Its sister spacecraft Voyager 1, which was launched Sept. 5, 1977, crossed the termination shock in December 2004 -- earlier than Voyager 2 because of a shorter trajectory. Both spacecraft are currently operational, but power sources have degraded and some of the instrumentation no longer works optimally. In the future, the spacecraft will encounter their next milestone in space: the heliopause, which is the boundary where the interstellar medium brings the solar wind to a halt.

Study results appear in the Dec. 1 issue of The Astrophysical Journal.

Washimi and Zank were joined in the research by UCR's Qiang Hu; Takashi Tanaka of Kyushu University, Japan; and Kazuoki Munakata of Shinshu University, Japan. The research was funded by grants from the National Science Foundation and the National Aeronautics and Space Administration.

Adapted from materials provided by University of California - Riverside.

http://www.sciencedaily.com/releases/2007/11/071127171052.htm

Researchers Examine Einstein's Theories On The Universe

Kepler's Supernova Remnant, SN1604 (Credit: NASA, ESA, R. Sankrit and W. Blair of John's Hopkins University)

ScienceDaily (Nov. 28, 2007) — Einstein's self-proclaimed "biggest blunder" -- his postulation of a cosmological constant (a force that opposes gravity and keeps the universe from collapsing) -- may not be such a blunder after all, according to the research of an international team of scientists that includes two Texas A&M University researchers.

The team is working on a project called ESSENCE that studies supernovae (exploding stars) to figure out if dark energy -- the accelerating force of the universe -- is consistent with Einstein's cosmological constant.

Texas A&M researchers Nicholas Suntzeff and Kevin Krisciunas are part of the project, which began in October of 2002 and is scheduled to end next month after achieving its goal of discovering and studying 200 supernovae. The team uses a 4-meter diameter telescope in Chile during the observing season of October to December to find the supernovae.

In 1917, Einstein was working on his Theory of General Relativity and was trying to come up with an equation that describes a static universe -- one that stands still and does not collapse under the force of gravity in a big crunch. In order to keep the universe static in his theory, Einstein introduced a cosmological constant -- a force that opposes the force of gravity.

Then, 12 years later, Edwin Hubble discovered that the universe is not static -- it is actually expanding. So Einstein scrapped his idea of a cosmological constant and dismissed it as his biggest blunder.

In 1998, however, two teams of scientists, one of which Texas A&M researcher Suntzeff co-founded, discovered that the universe is not only expanding, but its expansion is actually accelerating -- going faster and faster.

"So there had to be some other force that had overcome the force of gravity and is driving the universe into an exponential acceleration," Suntzeff said. This opposing force is what scientists now call dark energy, and it is believed to constitute roughly 74 percent of the universe. The other constituents of the

universe are dark matter, which composes about 22 percent of the universe, and ordinary matter, which is about 4 percent.

"Eighty years later, it turns out that Einstein may have been right [about a cosmological constant]," Krisciunas said. "So he was smarter than he gave himself credit for."

The type of supernovae that the ESSENCE team studies all give off the same amount of energy and have essentially the same peak brightness. Researchers can compare the observed brightness of a supernova that they see in the sky to its known actual brightness to figure out how far away the supernova is.

Researchers also look at what is called the redshift of the supernova, which tells them how fast the universe is expanding. When scientists compare the distance of the supernova to its redshift, they can measure the acceleration of the expansion of the universe. This acceleration is caused by the force scientists call dark energy.

The ESSENCE team can then use the value of the acceleration to figure out the density of dark energy, which they then use to calculate what is called the w-parameter. For Einstein's cosmological constant to be correct, the w-parameter must equal -1, and so far, the results of the ESSENCE project seem to confirm that it is indeed very close to -1.

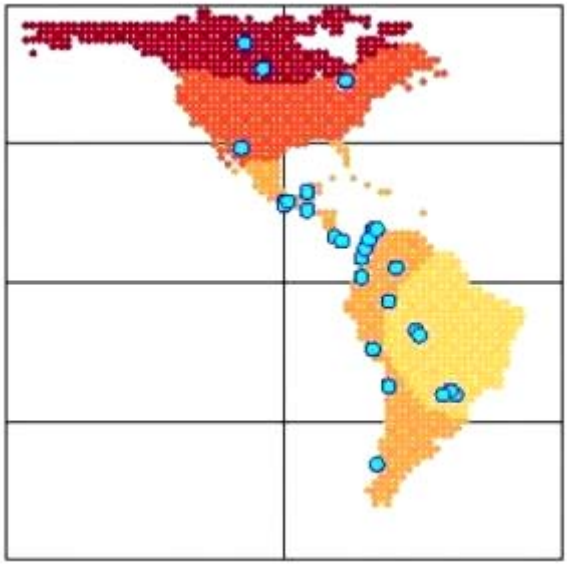
"The magic value is -1 exactly," Krisciunas said. "If the number turns out to be precisely -1, then this dark energy is a relatively simple thing -- it is Einstein's cosmological constant." The team won't have the final results until later next year, but right now, the measurement is coming in at -1 plus or minus 10 percent error, Suntzeff said, so the initial data seems to point to Einstein being correct.

"We can never test [dark energy] in the laboratory, so astronomers have to measure it [through observational data], and one of the ways we're measuring it is with supernovae in the ESSENCE project," Suntzeff said. "Dark energy is completely unexplained by conventional physics. Perhaps this is a manifestation of the 5th dimension from string theory. Or maybe it is a new vacuum energy density that is changing slowly in time. We have no idea, and that is what excites both physicists and astronomers."

Adapted from materials provided by Texas A&M University.

http://www.sciencedaily.com/releases/2007/11/071127142128.htm

Gene Study Supports Single Main Migration Across Bering Strait



The U-M study, which analyzed genetic data from 29 Native American populations, suggests a Siberian origin is much more likely than a South Asian or Polynesian origin. (Credit: University of Michigan)

ScienceDaily (Nov. 28, 2007) — Did a relatively small number of people from Siberia who trekked across a Bering Strait land bridge some 12,000 years ago give rise to the native peoples of North and South America?

Or did the ancestors of today's native peoples come from other parts of Asia or Polynesia, arriving multiple times at several places on the two continents, by sea as well as by land, in successive migrations that began as early as 30,000 years ago?

The questions -- featured on magazine covers and TV specials -- have agitated anthropologists, archaeologists and others for decades.

University of Michigan scientists, working with an international team of geneticists and anthropologists, have produced new genetic evidence that's likely to hearten proponents of the land bridge theory. The study, published online in PLoS Genetics, is one of the most comprehensive analyses so far among efforts to use genetic data to shed light on the topic.

The researchers examined genetic variation at 678 key locations or markers in the DNA of present-day members of 29 Native American populations across North, Central and South America. They also analyzed data from two Siberian groups. The analysis shows:

o genetic diversity, as well as genetic similarity to the Siberian groups, decreases the farther a native population is from the Bering Strait -- adding to existing archaeological and genetic evidence that the ancestors of native North and South Americans came by the northwest route.

o a unique genetic variant is widespread in Native Americans across both American continents -- suggesting that the first humans in the Americas came in a single migration or multiple waves from a single source, not in waves of migrations from different sources. The variant, which is not part of a gene and has no biological function, has not been found in genetic studies of people elsewhere in the world except eastern Siberia.

The researchers say the variant likely occurred shortly prior to migration to the Americas, or immediately afterwards.

"We have reasonably clear genetic evidence that the most likely candidate for the source of Native American populations is somewhere in east Asia," says Noah A. Rosenberg, Ph.D., assistant professor of human genetics and assistant research professor of bioinformatics at the Center for Computational Medicine and Biology at the U-M Medical School and assistant research professor at the U-M Life Sciences Institute.

"If there were a large number of migrations, and most of the source groups didn't have the variant, then we would not see the widespread presence of the mutation in the Americas," he says.

Rosenberg has previously studied the same set of 678 genetic markers used in the new study in 50 populations around the world, to learn which populations are genetically similar and what migration patterns might explain the similarities. For North and South America, the current research breaks new ground by looking at a large number of native populations using a large number of markers.

The pattern the research uncovered -- that as the founding populations moved south from the Bering Strait, genetic diversity declined -- is what one would expect when migration is relatively recent, says Mattias Jakobsson, Ph.D., co-first author of the paper and a post-doctoral fellow in human genetics at the U-M Medical School and the U-M Center for Computational Medicine and Biology. There has not been time yet for mutations that typically occur over longer periods to diversify the gene pool.

In addition, the study's findings hint at supporting evidence for scholars who believe early inhabitants followed the coasts to spread south into South America, rather than moving in waves across the interior.

"Assuming a migration route along the coast provides a slightly better fit with the pattern we see in genetic diversity," Rosenberg says.

The study also found that:

- Populations in the Andes and Central America showed genetic similarities.
- Populations from western South America showed more genetic variation than populations from eastern South America.
- Among closely related populations, the ones more similar linguistically were also more similar genetically.

Citation: PLoS Genet 3(11): e185. doi:10.1371/journal.pgen.0030185

In addition to Rosenberg and Jakobsson, study authors include Cecil M. Lewis, Jr., former post-doctoral fellow in the U-M Department of Human Genetics, and 24 researchers at U.S., Canadian, British, Central and South American universities.

Adapted from materials provided by University of Michigan Health System.

http://www.sciencedaily.com/releases/2007/11/071126170543.htm

Engineers Give Industry A Moth's Eye View

Certain moth species have evolved nanoscopic structures on the surface of their eyes which allow almost no light to reflect off the surface and hence to escape. (Credit: iStockphoto/Chan Pak Kei)

ScienceDaily (Nov. 28, 2007) — When moths fly at night, their eyes need to capture all the light available. To do this, certain species have evolved nanoscopic structures on the surface of their eyes which allow almost no light to reflect off the surface and hence to escape.

Now scientists at MicroBridge, a project at Cardiff University's Manufacturing Engineering Centre (MEC), have adopted the model to create an industrial lens for use in a low light environment.

The structures on the surface of the new lens are less than 100 nanometres in height (a nanometre is one millionth of a millimetre). They need to be smaller than the wavelength of light to avoid disrupting the light as it enters the lens.

The tiny features of the lens mould were created using the MEC's Focused Ion Beam. The beam uses highly charged atomic particles to machine materials in microscopic detail.Dr Robert Hoyle of the MEC said: "This was a particularly complicated challenge. Not only did the lenses have to be of very precise curvature but the nanoscopic structures on the lens surfaces had to be smaller than the wavelength of light so as to smooth out the sharp refractive index change as the light strikes the surface of the lens. This smoothing of the refractive index reduces the reflectiveness of the lens thus allowing it to capture more light. The end result has a number of highly practical uses for industry."

The research team is now looking at using the lens in optoelectronics and photovoltaic applications in semiconductors, including solar cells, where loss of light is a major problem. The lens also has potential uses in fibre optics, sensors and medical diagnostic devices.

Adapted from materials provided by Cardiff University.

http://www.sciencedaily.com/releases/2007/11/071126115318.htm

UK's toads 'at risk' from fungus

By Helen Briggs
Science and nature reporter, BBC News

Britain's native toads are at risk from a deadly infection that has driven many of the world's amphibians to extinction, say UK scientists.

The fungal disease is currently confined to Kent, where it was brought in by imported frogs.

But if it spread further it could, in theory, completely wipe out the British toad population, according to research published in a Royal Society journal.

Experts want tighter controls on the aquarium trade to protect native toads.

The chytrid fungus, or *Batrachochytrium dendrobatidis* , BD, as it is sometimes called, infects the skins of amphibians such as frogs, toads, salamanders and newts.

One-third of all the losses in amphibian species recorded around the world are thought to be due to the disease.

> **Under the worst case scenario, you could lose the common toad in the UK**
> Dr Matthew Fisher, Imperial College

Although the frogs that brought the fungus to Kent have long since disappeared, it is likely that they have left a reservoir of infection in the environment.

And scientists fear the disease is being brought into Britain time and time again through the world trade in amphibians.

"We strongly suspect BD is being introduced into the UK on a daily basis through the amphibian trade," said Dr Matthew Fisher, of Imperial College London.

"Our borders are wide open to the introduction of this infectious disease."

Severe declines

Dr Fisher and colleagues at the Institute of Zoology in London developed mathematical models to test what would happen if the disease found its way into breeding populations of the common toad (*Bufo bufo*), an amphibian which is known to be susceptible to BD.

They found that the critical parameter was the length of time the fungus could survive in the environment away from its natural host.

The models show that there would be little impact on UK toads if the fungus was only able to live outside its host for seven weeks.

But, if it was able to survive in water for a year, the impact would be considerable, with severe declines in the numbers of toads, and in some cases extinction in 10 years within infected areas.

Previous research has demonstrated that the fungus is able to live for at least seven weeks outside its natural host.

But the rapid declines in amphibian numbers in areas such as Australia and South America suggest that it may linger for much longer than has so far been seen in the laboratory.

Dr Matthew Fisher told the BBC: "Under the worst case scenario, you could lose the common toad in the UK. That's highly unlikely but it has to be taken into consideration."

Exotic pets

The research, published in the Proceedings of the Royal Society B, adds weight to calls to test all amphibians for the disease before they are brought into Britain.

The wildlife charity Froglife said it was important to make people aware of the danger to native amphibians.

"It is thought that it could have been brought to the UK by exotic pet species, such as the African clawed toad, that have escaped or been deliberately released," said a spokesperson.

"It is vital strict controls on the health of imported animals are in place to help limit the spread of this devastating disease."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/sci/tech/7115557.stm

Published: 2007/11/28 00:21:31 GMT

Politics 'stifling $100 laptop'

By Jonathan Fildes
Science and technology reporter, BBC News

The government of Nigeria is still assessing the scheme

A lack of "big thinking" by politicians has stifled a scheme to distribute laptops to children in the developing world, a spokesman has said.

Walter Bender of One Laptop per Child (OLPC) said politicians were unwilling to commit because "change equals risk".

But, he said, there needed to be a "dramatic change" because education in many countries was "failing" children.

In an interview with the BBC, Nigeria's education minister questioned the need for laptops in poorly equipped schools.

Dr Igwe Aja-Nwachuku said: "What is the sense of introducing One Laptop per Child when they don't have seats to sit down and learn; when they don't have uniforms to go to school in, where they don't have facilities?"

"We are more interested in laying a very solid foundation for quality education which will be efficient, effective, accessible and affordable."

The previous government of Nigeria had committed to buying one million laptops.

Dr Aja-Nwachuku said he was now assessing OLPC alongside other schemes from Microsoft and Intel.

"We are asking whether this is the most critical thing to drive education."

But speaking separately to BBC News, Professor Bender said: "We think that change has to be dramatic."

"You've got to be big, you've got to be bold. And what has happened is that there has been an effort to say 'don't take any risks - just do something small, something incremental'."

"It feels safe but by definition what you are ensuring is that nothing happens."

Winds of change

OLPC was started in 2002 by Nicholas Negroponte, a professor at the Massachusetts Institute of Technology.

It aims to put thousands of low-cost laptops, known as the XO, in the hands of children around the world.

The machines are planned to cost $100 and have been especially designed for use in remote and harsh environments where there is little access to electricity or the internet.

But getting the project off the ground has proved difficult.

Professor Negroponte has had high profile run-ins with major technology firms.

He told an audience at a Linux event: "if I am annoying Microsoft and Intel then I figure I am doing something right."

Microsoft head Bill Gates had questioned the XOs design, particularly the lack of hard drive and its "tiny screen".

But recently, the firm announced that it was working on a version of Windows XP that would run on the pared down machines.

The price will come down as the numbers go up. It will take time but it will happen
Walter Bender

"We are spending a non-trivial amount of money," Microsoft's Will Poole told Reuters.

Earlier this year, Professor Negroponte also accused Intel of selling its own cut-price laptop - the Classmate - below cost price to drive him out of markets. He said that Intel "should be ashamed of itself" and said its tactics had hurt his mission "enormously".

Within weeks it was announced that Intel had joined the board of OLPC amid speculation that the firm was unhappy about the XO using a processor from its main rival AMD.

'Small thinking'

Although these episodes now appear to be behind OLPC, Professor Bender said there was still an "aggressive" effort to undermine the charity.

"There is still a concerted misinformation campaign out there," he said.

Mr Bender said he would not speculate on who was behind the alleged campaign.

"Wherever it is coming from, it exists," he told BBC News.

But he said the main problem for OLPC was dealing with conservative politicians.

"Change equals risk especially for politicians. And we are certainly advocating change because the [education] system is failing these children," he said.

"It has not been that processor versus that processor or that operating system versus that operating system - it's been small thinking versus big thinking. That's really the issue," he said.

Sales target

Originally, the laptops were to be sold to governments in lots of one million for $100 apiece.

Over time, however, the project has dropped the minimum number of machines that can be ordered, leading some to speculate that governments were not buying into the scheme.

The project also recently launched an initiative to allow citizens of North America to buy two machines at a time; one for themselves and one for a child in a developing country.

But Mr Bender said the shift was because of a better understanding of how to distribute smaller numbers cheaply and effectively, rather than a lack of orders.

"Part of it was our understanding of how the supply chain was going to work and having enough flexibility in the supply chain to make it work with a small number," he said.

"The big numbers were really about how you get this thing started not how you make it work in the long term.

"That was always going to be about supporting any good idea that comes along. And we've been able to get it started without the big top down numbers so we are off and running."

Developing tool

Since the scheme was first announced in 2002 there have been reports of several countries signing up to it.

Both Nigeria and Libya were reported to have ordered more than one million laptops.

Other countries including Thailand and Pakistan had also placed orders, according to reports.

But recently, OLPC revealed it had just taken its first order for 100,000 of the machines, placed by the government of Uruguay.

"Uruguay is first then it will be Peru, Mexico, Ethiopia then we are going to be doing stuff in Haiti, Rwanda and Mongolia," said Mr Bender.

In addition, he said, OLPC had done a deal with Birmingham, Alabama, in the US, to provide the laptop for schools in the city.

"The numbers of countries where we have trials set up is also increasing," he said.

Tests were also going on in the Solomon Islands, Nepal and India, a country that had previously shunned the scheme.

The Indian Ministry of Education had previously dismissed the laptop as "pedagogically suspect", whilst the Education Secretary Sudeep Banerjee said the country needed "classrooms and teachers more urgently than fancy tools".

Tipping point

The first machines will cost almost double the $100 originally planned.

The high price has been blamed on the increasing cost of the raw materials for the components inside the XO. Each machine currently costs $188.

"The price will come down as the numbers go up. It will take time but it will happen," said Mr Bender.

The manufacturer of the laptop - Quanta - recently revealed it had started mass production of the machines, after a number of delays.

Previously, OLPC had said it needed three million orders to make production feasible.

Professor Negroponte said it was an important milestone that had been reached despite "all the naysayers".

"We're not turning back - we have passed the point of no return," said Mr Bender. "It is happening."

Were your children expecting one of these laptops? Are you a teacher at a school that has placed an order? Do you question the need for laptops in poorly equipped schools?

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7094695.stm

Published: 2007/11/27 08:41:15 GMT

Simple measures 'may thwart flu'
Simple physical measures, such as handwashing and wearing masks, could play a key role in blocking the spread of a flu pandemic, say researchers.

The UK government is doubling its stockpile of antiviral medicines in preparation for any future pandemic. But researchers believe simple, low- cost physical measures should be given higher priority.

The study, led by Australia's Bond University, features online in the British Medical Journal. Scientists believe a flu pandemic is inevitable at some point in the future. There are also concerns about the spread of potentially fatal respiratory diseases such as Sars.

There is mounting evidence to suggest the use of vaccines and antiviral drugs will be insufficient to interrupt the spread of flu. The latest research examined 51 studies on the effect of simple physical measures on preventing respiratory infections. Several of the studies focused specifically on the Sars outbreak in South-East Asia in 2003.

The researchers found handwashing and wearing masks, and gloves and gowns all had a positive effect - and were even more effective when combined. The researchers concluded that, in combination with measures such as isolation of infected patients, they could potentially provide an important defence against a pandemic.

More research needed

They argue that national governments should carry out more research into their use. Researcher Dr Tom Jefferson said: "Worried about the flu? Then we have some good news for you.

"Wash your hands, and if it is a really bad epidemic avoid contact with people and keep your distance. You may even consider wearing paper masks and disposable gloves. They work.

"Soap and water is cheap and if you come from a poor country it could save your life or your baby's life." Dr Martin Dawes, a family medicine expert at McGill University, Montreal, said there had been a lack of research into the best way to prevent spread of respiratory pandemics.

Although 336 trials on influenza have been registered on the World Health Organization international clinical trials registry, only three trials are about reducing transmission by keeping a physical distance from patients, or using barrier methods.

He said: "Because pandemic flu is such a potentially catastrophic event, governments worldwide should have commissioned such a review many years ago and not have left it to the academic community to take the lead."

Professor John Oxford, chair of the Hygiene Council and an expert in respiratory diseases based at Queen Mary College School of Medicine, agreed that barrier methods had a role to play.

However, he said the UK government was right to emphasise the primary importance of stockpiling antivirals and vaccines.

"Any suggestion that a bit of handwashing could replace the need for vaccines and antiviral drugs would be dangerous and foolhardy."

The Department of Health is launching a campaign to reduce the spread of colds, flu and other viruses.

The Catch It, Bin It, Kill It campaign emphasises the need to cover your nose and mouth with a tissue when you cough and sneeze, dispose of the tissue as soon as possible after use, and clean your hands at the first available opportunity.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7114517.stm

Published: 2007/11/28 00:09:11 GMT

Black pupils' attainment improves
The attainment of black children in England's schools has continued to improve, latest figures show.

A breakdown of this year's exam results shows a further narrowing of the gap, though black and mixed race children are still below white children.

At GCSE level, 49.1% of black Caribbean pupils obtained five good grades compared with 44.4% last year (up 4.7). The figure for white children was 59.5%. Including English and maths the gap widened to 13 percentage points. The gap under this tougher measure was 32.7% for black children against 45.7% for white children.

Differences

As in previous years, pupils from Indian and Chinese backgrounds performed well above national averages.

For example, just over 70% of Chinese youngsters obtained five good GCSEs including English and maths, compared with 45.4% of all pupils nationally.

And travellers of Irish or gypsy/Romany heritage did worst of all, though there were only about 500 of them covered by the statistics. Only 7% of gypsy children obtained five good GCSEs with English and maths. Girls outperformed boys across almost all the ethnic minorities, but with considerable variation between groups.

For instance 56.2% of black Caribbean girls obtained the equivalent of five good GCSEs, compared with 41.5% of boys. Schools Minister Lord Adonis said: "Over the last few years, our targeted programmes like Aiming High and London Challenge have helped pupils make significant progress.

"That is why we have rolled out both of these projects to ensure that no child is left behind and we give them the extra push they need."

Wealth gap

Lord Adonis said he was also pleased to see that the results of pupils eligible for free school meals were improving faster than the average.

"We want every child to benefit from improving standards, but we particularly want to close the gap for the most disadvantaged," he said.

There was nothing inevitable about black Caribbean pupils' achievement being worse than any other group of children
Steve Sinnott, NUT

But the Conservatives highlighted the way the gap between wealthy pupils and the rest rose as they progressed through school. Shadow Children's Secretary Michael Gove said: "These figures underline our concerns that education is not promoting social mobility.

"We should be closing the gap between the poorest and the rest in our schools, but it is widening, with those from the most disadvantaged backgrounds achieving less, and dropping out earlier."

Liberal Democrat spokesman David Laws said the figures showed the education system was "riddled with inequalities". "The Government must be disappointed with the failure to narrow the deprivation gap. [Schools Secretary] Ed Balls should now be urgently considering introducing a new funding system to target deprivation."

Steve Sinnott of the National Union of Teachers - which has produced its own report on helping black boys achieve - said the results showed that targeted additional support worked.

"There was nothing inevitable about black Caribbean pupils' achievement being worse than any other group of children," he said.

"But it is obvious that social class is the most powerful influence on pupil achievement.

"Gordon Brown must now set a date for achieving his target of raising state school spending to private school levels and within that make the top priority raising spending on youngsters from socially deprived backgrounds."

Primary school shifts

In the Key Stage 2 national curriculum tests at the end of primary school, 81% of all white children attained the expected level in English.

Among Chinese and Indian children it was 85% while among black Caribbean children it was 74%.

But these statistics for younger children also show demographic changes. Among the GCSE group - mostly aged 16 - there were 8,282 children from black Caribbean backgrounds and 11,240 from black African families.

At Key Stage 2 there were 8,328 black Caribbean 11-year-olds, suggesting a static population group.

But there were 14,319 black Africans - an increase of more than a quarter. There were also several thousand more Pakistani children in the younger cohort.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7114772.stm

Published: 2007/11/27 13:35:44 GMT

Controversial urbanists win top architecture award

By Blair Kamin

Tribune architecture critic

11:44 AM CST, November 27, 2007

Miami architects Andres Duany and Elizabeth Plater-Zyberk, the controversial husband and wife team who lead the traditional town planning movement called the New Urbanism, were named the winners Tuesday of next year's Richard H. Driehaus Prize, which goes annually to a tradition-minded designer and now comes with $200,000 in prize money. Duany and Plater-Zyberk are by far the best-known winners of the award, which was established in 2003 by Chicago investor Richard Driehaus as a kind of alternative to the better-known Pritzker Architecture Prize, which is endowed by the billionaire Pritzker family of Chicago and typically goes to a leading modernist. They are also the first team to win it while Plater-Zyberk is the first female winner.

The two have designed scores of towns, neighborhoods and regional plans, including Seaside, the Florida panhandle resort community that formed the backdrop for the movie "The Truman Show." In 2005, Duany led a weeklong state-sponsored brainstorming session, or "charrette," to redesign 11 cities and towns in Mississippi that had been devastated by Hurricane Katrina. "The Richard H. Driehaus Prize was created to celebrate classicism in the contemporary world. As champions of the New Urbanism movement, Andrés Duany and Elizabeth Plater-Zyberk have promoted the value system that defines classical architecture. Their body of work emphasizes community and context, which are the underpinnings of classical design," said Driehaus, founder and chairman of Driehaus Capital Managemen.

Duany and Plater-Zyberk will receive the award on March 29 in Chicago. Previously, the award was accompanied by a grant of $100,000, the same as the Pritzker Prize. But Driehaus recently doubled the amount, in part to attract attention to his prize. Duany and Plater-Zyberk should draw plenty of attention by themselves, however.

They are among the nation's leading critics of suburban sprawl, arguing that car-dominated settlement patterns have victimized everyone from commuters stuck in traffic jams to inner-city residents who lack access to jobs and services that have spread to the suburban fringe. Beginning with Seaside, which opened in the early 1980s, they have revived traditional town planning principles, bringing back street grids, front porches, town squares and other elements of pedestrian-friendly town planning that suburban planners had largely abandoned in favor of subdivisions and cul-de-sacs.

Some architects, critics and academics regard their efforts as nostalgic or arrogant, saying that sprawl is here to stay and that it offers middle-class people the mobility, privacy and choice once enjoyed solely by the rich. But Duany and Plater-Zyberk have persisted, and many communities have adopted their principles — or watered-down versions of them. In their book, "Suburban Nation," published in 2000, they write: "[We] believe more strongly than ever in the power of good design to overcome the ills created by bad design, or, more accurately, by design's conspicuous absence."

Previous winners of the Driehaus Prize include architect Allan Greenberg and urban planner Jaquelin Robertson. Duany and Plater-Zyberk were selected by a jury that included Driehaus and Paul Goldberger, the architecture critic of The New Yorker. The University of Notre Dame School of Architecture, a bastion of traditional design, administers the Driehaus Prize.

bkamin@tribune.com

http://www.chicagotribune.com/entertainment/arts/chi-1128driehausnov29,1,808634.story?track=rss&ctrack=1&cset=true

Home of the Future
Interactive Computing Experts Design New Devices For Everyday Uses

November 1, 2007 — Computer scientists have found new ways to use technology to make peopleýs lives easier. Setting up cameras in the kitchen to record each step made in cooking helps cooks pick up where they left off if distracted. An electronic picture can use symbols to convey a wealth of information ý the more stripes on the barber pole, the more traffic on the way home. A camera worn around a personýs neck can interpret gestures, transmit them to electronic devices, replacing remote controls.

What does your future look like? Here's a look at what some of the leading scientists are working on today to bring into your homes tomorrow.

On the outside a home might look like any other ... but inside, it's can be high-tech all the way! Sensors can show if someone is in your home and where they are at all times. You can check in from any computer -- anywhere.

"A system called the cook's collage uses these cameras and it takes pictures as you cook," Elizabeth Mynatt, interactive computing expert at Georgia Tech in Atlanta, told Ivanhoe.

The cook's collage records the images so if you get distracted by the kids when you're cooking, you can take a quick look and remember what you've already done.

And they say a painting says a thousand words -- well some paintings actually do. These painting are called Info Canvases.

"It helps people keep aware of the information that may not be crucial, but it's important in their lives," John Stasko, interactive computing expert at Georgia Tech in Atlanta, told Ivanhoe.

The electronic picture is hooked up to the computer, so at a quick glance, images in the picture reflect what's going on. The more red stripes on a barber poll, the worse the traffic on the way home. A sailboat represents the time of day. The sun on represents the weather right now, and on the other side of the picture is the forecast for tomorrow. The color of a towel changes when there's an email from a spouse.

"If your stocks are doing really well, maybe a bird will be flying high in the sky. When they're not doing so well [it's not]," Stasko said.

And forget your remote control! A new gesture watch has four sensors on it and can recognize hand gestures that can control the TV, lights, DVD, mp3 player -- just about anything.

And instead of an office, this may be all you'll need -- a wearable computer. Thad Starner wears his computer on a heads up display. Thad sees notes, past emails, and is able to email colleagues as he's talking to someone else.

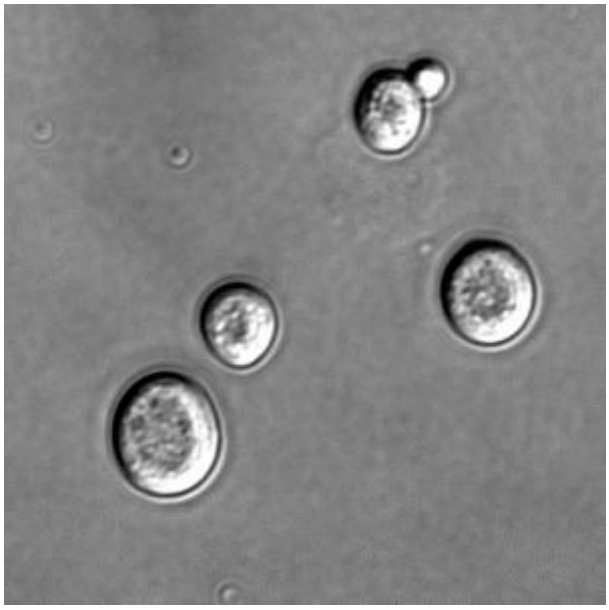
"Just like a normal computer display, but it puts the image right out here in front of me," Starner said.

It's hooked up to a battery pack and small computer -- and can run for days. Starner says the wearable computer doesn't hurt his eyes and that actually, his eyesight has gotten better since he's started using it. All of this technology is being tested right now, and could be ready for consumers in the next five years. Just a few new ideas that may change the way you live in the future.

The Human Factors and Ergonomics Society contributed to the information contained in the TV portion of this report.

http://www.sciencedaily.com/videos/2007/1101-home_of_the_future.htm

Scientists Map Nucleosomes In Yeast Genome



Microscopic view of Sacharomyces cerevisiae (yeast) cells. (Credit: Wikimedia Commons)

ScienceDaily (Nov. 28, 2007) — University of Toronto scientists have devised a tool to help understand and predict the state of a cell by successfully mapping all 70,000 nucleosomes in yeast. Nucleosomes wrap DNA before it is transformed into proteins and are critical indicators and regulators of a cell's state.

Led by Corey Nislow, a U of T Assistant Professor with the Banting and Best Department of Medical Research and Department of Molecular Genetics, the team created a complete, three-dimensional map of the yeast genome. This information was fed into a computer to build a software program that can predict where nucleosomes should be. The program worked remarkably well, and its accuracy will only improve with more data.

"When control is lost, cells make inappropriate proteins or divide inappropriately, which is what happens in diseases like cancer," says Nislow, whose team worked closely with U of T Professor Timothy Hughes on the project. "Knowing where nucleosomes are is the first step in identifying what is going on in a cell and what the cell plans to do next, so this initial research could have big implications down the road for early detection of certain diseases."

Scientists can tell by the presence of nucleosomes which genes are actively being converted into protein, and this information can function as an important first clue to disease detection.

The research appeared in the scientific journal Nature Genetics.

Adapted from materials provided by University of Toronto.

http://www.sciencedaily.com/releases/2007/11/071126110438.htm

Enzyme Mutation Disrupts Organ Growth

ScienceDaily (Nov. 28, 2007) — The cellular mechanism that turns DNA into all of the thousands of proteins that make up a human body is itself both intricate and interesting. A key player in the process--called transcription--is the enzyme RNA polymerase III. A new study reports that a mutation of this enzyme prevents cell division, but surprisingly, only affects the development of specific organs. It may also have a therapeutic application against cancer.

A team of researchers led by Dr. Michael Pack, at the University of Pennsylvania, investigated the mutation in RNA polymerase III of the zebrafish, an animal model system that is increasingly being used to study human development and disease. Seventeen different subunits combine to form the RNA polymerase III enzyme in organisms as diverse as yeast, zebrafish, and humans.

Transcription of tRNAs and other noncoding RNAs by RNA polymerase III is essential for cell proliferation, growth, and survival. With the aide of experiments in the fission yeast, S. pombe, the authors report how a small in-frame deletion in the second largest Pol III subunit, Polr3b, affects tissue progenitor cells in the developing zebrafish digestive system.

The mutation they studied, which is called slim jim (because mutant fish are comparatively thin due to developmental differences), affects only one of these subunits. This subtle change is enough to prevent cells from dividing, because with disrupted transcription machinery, a cell is unable to make enough protein to give rise to two daughter cells.

To further study how the slim jim mutation affected the 17 subunit RNA Polymerase III complex, Dr. Pack's laboratory collaborated with Dr. Richard Maraia. Dr. Maraia's laboratory, at the National Institutes of Health, engineered a similar mutation in the fission yeast Sacchromyces pombe. These experiments showed that the mutation's effect arises because the mutated subunit cannot interact properly with one of its neighbors in the yeast RNA Polymerase III complex.

Remarkably, Dr. Pack's lab showed that when high levels of this interacting subunit are experimentally induced in zebrafish, the slim jim defects were reversed. These experiments are interesting because they show how highly conserved the transcriptional mechanism and its regulation have been throughout animal evolution.

The slim jim mutation only has a strong effect in certain zebrafish tissues, such as the intestine, whereas other organs, including the heart, are relatively unaffected. Dr. Pack explained that this is likely to derive from the different developmental patterns of each organ. Tissues that require cell division to continue late into development or in the adult--and therefore have higher demands for protein production--are the most severely affected.

This provides hope that disrupting this gene in cancer patients may prove beneficial. Cancer is a disease caused by unstoppable cell division, and a therapy that decreases the efficiency of RNA Polymerase III would have a strong effect specifically on cancer growth, which has very high demands for protein production.

Journal citation: Yee NS,, Gong W, Huang Y, Lorent K, Dolan AC , et al. (2007) Mutation of RNA Pol III subunit rpc2/polr3b leads to deficiency of subunit Rpc11 and disrupts zebrafish digestive development. PLoS Biol 5(11): 12.doi:10.1371/journal.pbio.0050312

Adapted from materials provided by Public Library of Science.

http://www.scie

Nasa outlines manned Mars vision

By Paul Rincon
Science reporter, BBC News

Nasa has released details of its strategy for sending a human crew to Mars within the next few decades.

The US space agency envisages despatching a "minimal" crew on a 30-month round trip to the Red Planet in a 400,000kg (880,000lb) spacecraft.

Details of the concept were outlined at a meeting in Houston, Texas.

In January 2004, President George W Bush launched a programme for returning humans to the Moon by 2020 and - at an undetermined date - to Mars.

The "Mars ship" would be assembled in low-Earth orbit using three to four Ares V rockets - the new heavy-lift launch vehicle that Nasa has been developing.

Notionally despatched in February 2031, the mission's journey from Earth to Mars would take six to seven months in a spacecraft powered by an advanced cryogenic fuel propulsion system.

Estimates of the cost of mounting a manned Mars mission vary enormously, from $20bn to $450bn.

The details are subject to change, and may not represent the way Nasa eventually chooses to go to the Red Planet.

However, the document says this is the agency's current "best strategy" for landing humans on the Martian surface.

Grow your own

The cargo lander and surface habitat would be sent to Mars separately, launched before the crew in December 2028 and January 2029.

According to the Nasa presentation seen by BBC News, astronauts could grow their own fruit and vegetables on the way.

Once there, astronauts could spend up to 16 months on the Martian surface, and would use nuclear energy to power their habitat.

But the document points out that options for aborting the mission or furnishing the crew with new supplies would be extremely limited.

The difficulties of re-supply mean the astronauts would have to be remarkably self-sufficient.

They would need to be well-versed in the maintenance and repair of equipment and perhaps even able to manufacture new parts.

Recycled water

The spacecraft itself would be equipped with so-called "closed-loop" life support systems, in which air and water would be recycled.

Plants would be grown onboard to feed the crew and contribute to the "psychological health" of the astronauts.

But the report, authored by Nasa official Bret Drake, who sits on the agency's Robotic and Human Lunar Expeditions Strategic Roadmap Committee, says that many challenges remain for ensuring safe passage for the crew.

Nasa needs to come up with solutions for effectively protecting the astronauts from the high levels of cosmic radiation they will be exposed to in deep space and on the surface of Mars.

They will also need medical equipment for the diagnosis and treatment of illnesses or injuries.

Nasa proposes using the Moon as a testing ground for many of these new systems.

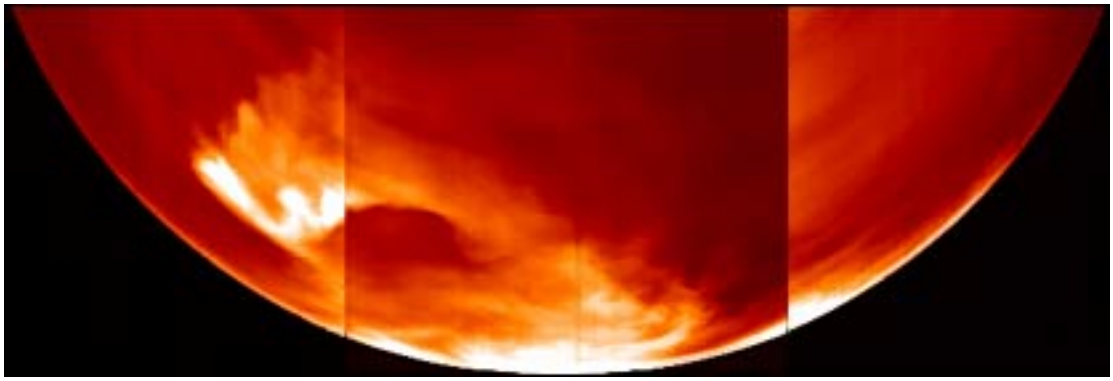
Details of the plan, which comes under Nasa's new Constellation programme, were presented at a meeting of Nasa's Lunar Exploration and Analysis Group.

Paul.Rincon-INTERNET@bbc.co.uk

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7116834.stm

Published: 2007/11/28 16:37:38 GMT

Venus offers Earth climate clues
Observations of the planet Venus might assist efforts to tackle the threat of climate change here on Earth.



Data from a European probe orbiting Venus paints a picture of a planet that may once have been like Earth, but later evolved in a very different way.

Venus has undergone runaway greenhouse warming, where trapped solar radiation has heated the surface to an average temperature of 467C (872F).

New results from the Venus Express mission appear in Nature journal.

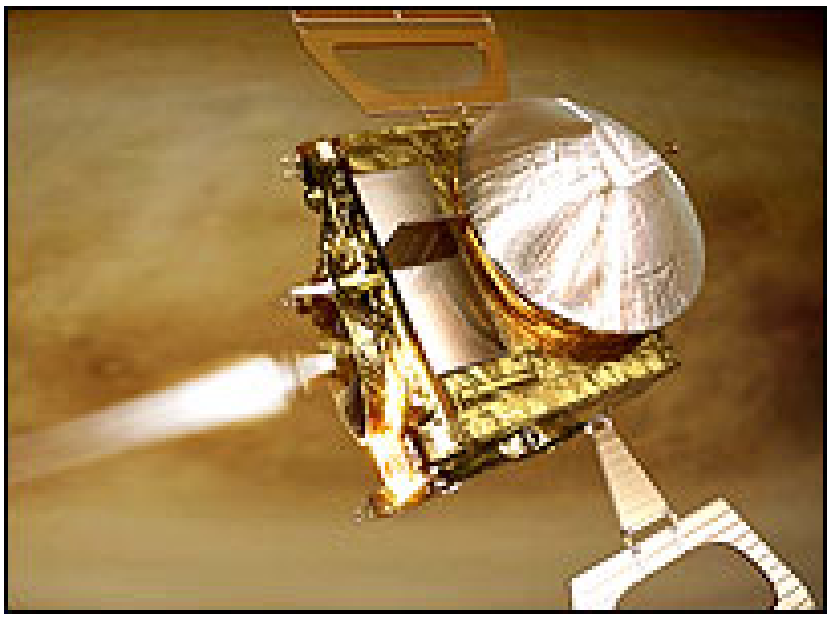
In size, mass and composition, Earth and Venus are remarkably similar. Venus is closer to the Sun, but this alone does not explain the differences with Earth.

Venus lacks the Earth's magnetic shield, which means that its atmosphere feels the full onslaught of the solar wind - a stream of charged particles from our star - and cosmic radiation, and has done so for billions of years.

Lost water

The absence of this shield means that hydrogen, helium and oxygen are blown away by the solar wind much faster than happens on Earth.

The scientists think that Venus may once have held copious amounts of water on its surface.



But the solar wind removed most of it during the first billion years or so after the formation of the Solar System.

Professor Fred Taylor, from the University of Oxford and a scientist on the mission, said: "It is now becoming clear why the climate on Venus is so different to Earth, when the planets themselves are otherwise quite similar.

"Our new data make it possible to construct a scenario in which Venus started out like the Earth - possibly including a habitable environment, billions of years ago - and then evolved to the state we see now."

Mitigating the threat

Ian Pearson, the UK minister for science and innovation, said: "Understanding the influencing factors of global warming on Venus could help us in mitigating the threat here on Earth."

British scientists and engineers are playing a leading role on the European Space Agency (Esa) mission.

Venus Express has also confirmed the presence of lightning on the planet. The idea of lightning on Venus was once considered controversial, but the magnetometer instrument on Venus Express has now put all doubts to one side.

Indeed, the data suggests that lightning is more common on Venus than it is on Earth.

Previous observations have revealed a vast rotating vortex of clouds with a "double-eye" feature at Venus' north pole. Researchers have now found evidence for similar features at the south pole, but these rotate slightly faster.

Researchers do not yet have any evidence for active volcanism on the Venusian surface, something that has been proposed in the past.

Venus Express was launched from the Baikonur Cosmodrome in Kazahstan in November 2005. It reached orbit around Venus in April 2006.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7117303.stm

Published: 2007/11/28 18:33:16 GMT

Europeans hang up on fixed lines
Almost a fifth of European households use a mobile as their only phone, reveals research.

Lithuania heads the nations who have turned against landlines with 48% of households replacing a fixed phone with a mobile. Finland was second with 47%.

The figures from Eurostat, the EC's in-house statistical office, show how mobile phones have become essential to everyday European life.

It reports there are now 95 mobile phones for every 100 Europeans.

While the average across 25 EU member nations is 18% the figures reveal a divide between old and new Europe in commitment to fixed phones.

Older members of the EU, such as the UK (13%) and Germany (11%), tended to have fewer mobile-only homes compared to newcomers such as the Czech Republic which has 42%.

A partial explanation for the difference could be that fixed line penetration in many newer, former communist, EU members was never as high as it was in nations such as France and the UK.

In many of the former eastern bloc countries a mobile could often be the first phone that someone owns.

However, the figures showed that fixed lines were not falling entirely out of favour. The number of lines per 100 people has grown from 43 in 1995 to 48 in 2005 - the last time period for which these figures are available.

The numbers of mobile subscriptions per 100 people also varied widely from the regional average of 95, said Eurostat.

Luxembourg racked up 158 mobile subscriptions per 100 people, closely followed by Lithuania (127) and Italy (122). Romania recorded the lowest number in this category with only 62 mobile subscriptions for every 100 people.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7116599.stm

Published: 2007/11/28 11:14:35 GMT

Call to redirect cancer drug cash

By Simon Cox
BBC Radio 4's The Investigation

The millions the NHS spends on breast cancer drug Herceptin could be used to treat thousands of people using other therapies, a top specialist has said.

Dr Peter Kirkbride, the chief spokesman on radiotherapy for the NHS, said the NHS spent £100m on the breast cancer drug Herceptin in 2006.

But he told Radio 4's The Investigation only about 500 patients had benefited - at a cost of about £200,000 each.

If that was spent on radiotherapy, it could have a dramatic impact, he said.

Cancer survival in the UK is still below the European average, despite recent improvements.

Herceptin was approved for use in women with early stage breast cancer in 2006 after a fast-track assessment by the National Institute for Health and Clinical Excellence.

But now some cancer doctors are concerned this focus on new cancer drugs may not be a good thing.

Dr Kirkbride said: "There is a lot of publicity about the role of chemotherapy but the consensus is of all cancers that are cured, half are cured by surgeries, 40% by radiotherapy and only 10% by drugs.

"If I was to spend £100m on radiotherapy, I could buy something like 90 machines, I could buy 30 simulators and I could probably benefit about 30,000 patients for the same amount of money."

Radiotherapy problems

Earlier this year, the National Radiotherapy Advisory Group published a report which called for a 91% increase in radiotherapy treatments in England in the next 10 years.

But the trade body for the manufacturers of radiotherapy machines has told the BBC that instead of seeing more business, it has all but dried up.

David Miles, the chairman of the radiotherapy specialist focus group of the Association of X-ray Equipment Manufacturers which formed to highlight the problem, says there has been a "collapse in critical investment".

He said: "We noticed after the government initiatives to improve the established stock of radiotherapy equipment, it actually ended in April last year. And the sales of machines then fell off drastically.

"One order has been placed in the last 20 months."

Because it takes around three years from when an order is first placed until it treats its first patient, the radiotherapy focus group at AXrEM says the NHS should have bought 20 replacements machines by now instead of just one.

'Not sexy enough'

Dr Kirkbride thinks part of the problem is raising the discipline's profile in the eyes of both the public and government.

He said: "We are not sexy enough. We don't have pharmaceutical companies backing us in the same way that some of the drugs companies support campaigns for the use of their drugs."

Professor Mike Richards, the National Cancer Director, said there should be room in the cancer budget for both.

He said: "There is no doubt that Herceptin is a good drug. There is no doubt that it has been looked at carefully by NICE and it has been deemed to be both effective and cost-effective.

"Radiotherapy is also effective and we need to make sure that it's not one or the other, but that we actually have a service that delivers both."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7115540.stm

Published: 2007/11/29 05:33:42 GMT

One in 10 suffers 'hospital harm'
Accidents, errors and mishaps in hospital affect as many as one in 10 in-patients, claim researchers.

The report in the journal Quality and Safety in Health Care said up to half of these were preventable.

Checks on 1,000 cases in just one hospital found examples of fatal surgical errors, infections and drug complications.

Researchers from the University of York experts say more should be spent on monitoring "adverse incidents".

PREVENTABLE HARM
Skin burned with diathermy tool during operation
Delay in cancer diagnosis
Bleeding from penis after catheter removed without deflating balloon
Spleen torn during operation - patient needed six litres of blood to survive
Patient addicted to painkillers after high dose continued after discharge

The government has encouraged trusts in recent years to spend more effort looking at complications and mistakes involving their patients.

Managers are supposed to report even "near misses" in which patients suffered no harm, so that lessons can be learned.

However, other studies have suggested that the reporting rate is poor. The University of York study focused on a single major acute hospital in England, and pored over the notes of 1,006 people admitted into it.

Possible under-estimate

While 87 people had definitely suffered at least one "adverse event", the researchers said it was likely that even more had suffered harm.

Alongside more than 40 infections, there were 27 complications during or following operations, 19 drug complications, and 12 cases of bedsores. Between 30% and 55% of these could have been prevented by clinical staff or managers.

Examples of preventable incidents included a mistake in an operation which led to the death of the patient, another which caused lifelong damage, and a case in which a patient became addicted to opioid drugs after being given a high dose during and after a hospital stay.

The rates we found do not show that the NHS is faring worse - this is an international issue, and other countries have similar or worse rates
Professor Trevor Sheldon
University of York

Professor Trevor Sheldon, who led the research, said that "finger-pointing" was not the answer - although the scale of the problem meant that more resources should be spent tackling it.

"The rates we found do not show that the NHS is faring worse - this is an international issue, and other countries have similar or worse rates.

"The question we have to ask is whether the NHS is currently doing enough to help people find the time to reflect on these cases and learn lessons from them.

"Our research does confirm though that hospitals are not completely safe places, and that people should try to steer clear of them unless absolutely necessary."

Many adverse events could be avoided if lessons were properly learned and fed back into practice
Department of Health

A spokesman for the Department of Health said that the creation of the National Patient Safety Agency (NPSA) in 2001 was designed specifically to improve the NHS response to adverse incidents.

"We have long recognised patient safety as a top priority, and it is important to remember that serious failures are uncommon in relation to the volume of care provided by the NHS.

"As the study suggests, many adverse events could be avoided if lessons were properly learned and fed back into practice."

A spokesman for the NPSA welcomed the study, and said it was working with the NHS to improve safety.

"Around 13 million people are admitted to acute hospitals each year in England and Wales. Most people are cared for safely, however regrettably sometimes things can and do go wrong."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7116711.stm

Published: 2007/11/29 02:05:04 GMT

England falls in reading league
The reading performance of children in England has fallen from third to 19th in the world in a major assessment.

The Progress in International Reading Literacy Study (Pirls), undertaken every five years, involved children aged about 10 in 40 countries.

Scotland also fell, from 14th to 26th. Russia, which matched it last time, was top of the overall achievement table.

Analysis of the England results said children were spending more time on computers and reading less for fun.

'READING LITERACY'
Defined as the ability to understand and use those written language forms required by society and/or valued by the individual

Pirls is designed to investigate children's "reading literacy" and associated factors after, in most countries, four years of formal schooling - five in some, including England and Scotland.

First run in 2001, it involves data from a sample of pupils, their parents and their teachers and head teachers.

In England, the Department for Children, Schools and Families commissioned a separate report on the findings, from the independent National Foundation for Educational Research (NFER).

READ THE ENGLAND REPORT

Most computers will open this document automatically, but you may need Adobe Reader

Education ministers have repeatedly held up England's high performance in 2001 as being a credit to the country's education system.

After seeing the 2006 results the Children, Schools and Families Secretary, Ed Balls, said parents must do more.

Key findings:

- Pupils in England achieved significantly above the international mean in Pirls 2006 but significantly lower than some major European countries, including Italy and Germany.
- The performance of the three highest attaining countries in 2001 - Sweden, the Netherlands and England - was significantly lower in 2006.
- The three highest achieving countries in 2006 were the Russian Federation, Hong Kong and Singapore.
- The score for England in 2006 was 539 and 527 for Scotland, against 565 for the Russian Federation, an average of 500, and 302 for South Africa, the lowest achieving country.
- In almost all countries, including England, girls achieved significantly higher mean scores than boys.
- As in 2001, there was a wide spread in the scores of the most able and the weakest readers in England.
- In England, the performance of girls has fallen slightly more than that of boys, and the performance of both is significantly lower than in 2001.
- The fall in England's performance in 2006 is evident across the ability range.
- Attitudes to reading in England are poor compared to those of children in many other countries, and have declined slightly since 2001.
- Children in England read for pleasure less frequently than their peers in many other countries.
- More reported having a computer at home (93% in 2006 / 85% in 2001); fewer had a desk or table to work at (75% / 89%), books of their own (92% / 96%) or a daily newspaper (66% / 78%).

The analysts at NFER said it appeared that lower achievement among the better readers had contributed most to England's overall fall, rather than the small increase in the proportion of weaker readers.

There had been significant increases in the proportion of English 10-year-olds with the "least positive" attitudes to reading and who said they very seldom read stories or novels outside school.

As parents we have to get the balance right and as a society we have to send the right messages about the value of reading to our children
Ed Balls
Children, Schools and Families Secretary

Mr Balls said it was the same story as that emerging from the government's consultation on its Children's Plan.

"Parents are worried about striking the right balance between play, reading, TV and computer games at home," he said.

"This study shows that our highest achieving children are reading less with children's busy days leaving less time for books at home.

"As parents we have to get the balance right and as a society we have to send the right messages about the value of reading to our children."

TVs and mobiles

The government had brought in phonics across the primary curriculum and introduced one-to-one tuition and small group schemes for those who needed extra help, Mr Balls said.

Today's 10-year-olds had more choice about how to spend their free time.

"Most of them have their own TVs and mobiles, and 37% of our 10-year-olds are playing computer games for three hours or more a day - more than in most countries in the study.

"That's why I'm calling today for everyone's help to get our children reading more and to kick-start a new national debate about the value of reading."

The general secretary of the NASUWT teachers¿ union, Chris Keates, agreed that reading standards were not the responsibility of schools alone.

"Parents need to recognise the importance of children reading regularly outside school and their responsibility to send them to school ready to learn."

Resources

Liberal Democrat schools spokesman David Laws said ministers should be ashamed.

"It suggests that all of its recent strategies to make children read more have been ineffective," he said.

Shadow children¿s secretary Michael Gove said: "It's time the government stopped blaming parents and accepted the case we've been making for a new focus on teaching reading using tried and tested methods, with a test after two years in primary school to ensure our children are being taught properly."

Scotland's Minister for Schools and Skills, Maureen Watt, said she was pleased its most able pupils ranked amongst the highest achievers in the international study.

"However, there is much to do to close the gap between the best and worst performers in Scotland which has remained persistently large," she said.

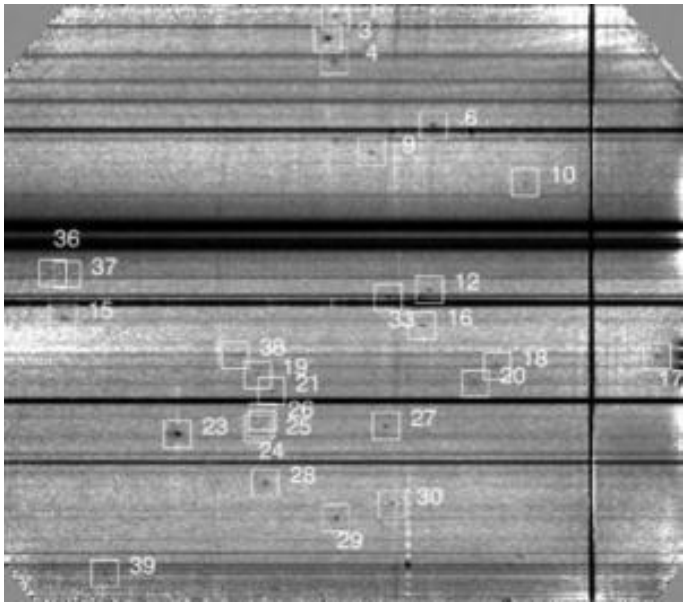
"The report also shows what this government already knows - that pupils in schools in areas of deprivation don't do as well. We are determined to improve the situation we have inherited."

PARTICIPATING COUNTRIES
(* also participated in 2001)
Austria
Belgium (Flemish)
Belgium (French)
Bulgaria*
Canada+
Chinese Taipei
Denmark
England*
France*
Georgia
Germany*
Hong Kong*
Hungary*
Iceland*
Indonesia
Iran*
Israel*

Italy*
Kuwait
Latvia*
Lithuania*
Luxembourg
Macedonia*
Moldova*
Morocco*
Netherlands*
New Zealand*
Norway*
Poland
Qatar
Romania*
Russian Federation*
Scotland*
Singapore*
Slovak Republic*
Slovenia*
South Africa
Spain
Sweden*
Trinidad and Tobago
United States*
+ In 2001 the provinces of Ontario and Quebec participated. These were joined in 2006 by Alberta, British Columbia and Nova Scotia. Their data have been placed separately in the report and did not contribute to the calculation of the international mean.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7117230.stm

Discovering Teenage Galaxies Billions Of Light Years Away



A 92-hour long spectrum Two-dimensional spectrum obtained in 92 hours of exposure time, showing the line emitter candidates. The quasar absorption lines are visible close to the centre of the image. (Credit: Image courtesy of ESO)

ScienceDaily (Nov. 28, 2007) — Staring for the equivalent of every night for two weeks at the same little patch of sky with ESO's Very Large Telescope, an international team of astronomers has found the extremely faint light from teenage galaxies billions of light years away. These galaxies, which the research team believes are the building blocks of normal galaxies like our Milky Way, had eluded detection for three decades, despite intensive searches.

The team, led by Martin Haehnelt of the University of Cambridge, UK, Michael Rauch and George Becker of the Observatories of the Carnegie Institution, USA, and Andy Bunker of the Anglo-Australian Observatory, reports their results in the 1 March 2008 issue of the Astrophysical Journal.

"The farther we look back into space the farther we see back in time," explained Rauch." We were actually trying to measure a faint signal from intergalactic gas caused by the cosmic ultraviolet background radiation. But as often happens in science, we got a surprise and found something we weren't looking for--dozens of faint, discrete objects emitting radiation from neutral hydrogen in the so-called Lyman alpha line, a fundamental signature of protogalaxies."

A popular theory of galaxy formation predicts that the gas accreted forming smaller protogalaxies, which then collided and merged to become the massive galaxies seen today. The new discovery lends strong support to this theory.

During the 1990s there was mounting evidence in favor of this hierarchical picture of galactic evolution, including measurements of distant quasars by Rauch and collaborators that showed how the properties of cosmic gas clouds--the reservoir of matter for galaxy formation--fit within that scheme.

"Most of those gas clouds are dark and visible only as foreground objects, which cast something of a shadow against a bright background quasar," Becker said. "Intriguingly, one class of these shadows--known as damped Lyman alpha systems--was suspected to arise when those small, protogalactic building blocks intersect the line-of-sight to the quasar. For many years, these shadows were our only hint that a population of numerous early galaxies existed."

"This is the first time that the sky has been searched to this depth and the unrivalled sensitivity of the picture taken with the VLT was key to succeeding," says Haehnelt.

"Previous attempts have usually been frustrated by the difficulty of detecting extremely faint objects: the amount of time required even with an 8-metre class telescope like the VLT considerably exceeds typical observing time awards. We have thus exploited the periods of less good weather with the FORS2 spectrograph at the VLT, taking advantage of the service observing mode," says Becker.

In service mode, ESO staff astronomers at Paranal are responsible for carrying out the actual observations, taking all the specific requirements into account.

"We were actually trying to measure a faint signal from intergalactic gas caused by the cosmic ultraviolet background radiation. But as often happens in science, we got a surprise and found something we weren't looking for--dozens of faint, discrete objects emitting radiation from neutral hydrogen in the so-called Lyman alpha line, a fundamental signature of protogalaxies," explains Rauch.

The same small patch of sky, centred on a quasar, was observed between 2004 and 2006 for an unprecedented 92 hours, the equivalent of about 12 complete nights, allowing the astronomers to obtain a spectrum of the Universe when it was only 2 billion years old.

The result of this search is the detection of 27 faint objects. The weak light signal that the team has detected from these distant objects implies low star formation rates and a small amount of chemical enrichment, suggesting that they are indeed at an early stage of formation.

"The properties of the emitters seem to provide an excellent match to those of 'Damped Lyman Alpha Systems', the main reservoir of neutral hydrogen in the far Universe," says Andy Bunker. "This suggests that the objects found are the long-sought counterparts of the DLAS in emission. The new observations confirm theoretical research proposing that galaxies like our own have formed by the amalgamation of small proto-galaxies early on in the history of the Universe," he adds.

"What makes our discovery particularly exciting is that it opens the route to find large numbers of building blocks of normal galaxies and that we will now be able to study in detail how galaxies like our Milky Way have come together, " says Martin Haehnelt.

The results are reported in a paper in press in the Astrophysical Journal ("A Population of Faint Extended Line Emitters and the Host Galaxies of Optically Thick QSO Absorption Systems", by M. Rauch et al.). The team is composed of Michael Rauch and George Becker (Observatories of the Carnegie Institution of Washington, Pasadena, USA), Martin Haehnelt (Institute of Astronomy, Cambridge, UK), Andrew Bunker (Anglo-Australian Observatory and School of Physics, Exeter, UK), Francine Marleau (Spitzer Science Center, Caltech, USA), James Graham (University of California, Berkeley, USA), Stefano Cristiani (Osservatorio Astronomico di Trieste, INAF, Italy), Matt J. Jarvis (University of Hertfordshire, UK), Cedric Lacey, Simon Morris, and Tom Theuns (Durham University, UK), Celine Peroux (Observatoire Astronomique de Marseille-Provence, France), and Huub Röttgering (Leiden Observatory, The Netherlands)

Adapted from materials provided by ESO.

http://www.sciencedaily.com/releases/2007/11/071127171056.htm

More Than One-quarter Of US Bird Species Imperiled, Report States

Whooping crane. (Credit: Ryan Hagerty, FWS)

ScienceDaily (Nov. 29, 2007) — One hundred seventy-eight species in the continental U.S. and 39 in Hawaii have the dubious distinction of landing on the newest and most scientifically sound list of America's most imperiled birds. WatchList 2007, a joint effort of Audubon and American Bird Conservancy, reflects a comprehensive analysis of population size and trends, distribution, and threats for 700 bird species in the U.S. It reveals those in greatest need of immediate conservation help simply to survive amid a convergence of environmental challenges, including habitat loss, invasive species and global warming.

"We call this a 'WatchList' but it is really a call to action, because the alternative is to watch these species slip ever closer to oblivion," said Audubon Bird Conservation Director and co-author of the new list, Greg Butcher. "Agreeing on which species are at the greatest risk is the first step in building the public policies, funding support, innovative conservation initiatives and public commitment needed to save them."

The new Audubon/American Bird Conservancy WatchList identifies 59 continental and 39 Hawaiian "red list" species of greatest concern, and 119 more in the "yellow" category of seriously declining or rare species. It is based on the latest available research and assessment from the bird conservation community along with data from the Christmas Bird Count and the annual Breeding Bird Survey. The data were analyzed and weighted according to methods developed through extensive peer review and revision, yielding an improved assessment of actual peril that can be used to determine bird conservation priorities and funding.

"Adoption of this list as the 'industry standard' will help to ensure that conservation resources are allocated to the most important conservation needs," said David Pashley, American Bird Conservancy's Director of Conservation Programs and co-author of the new list. "How quickly and effectively we act to protect and support the species on this list will determine their future; where we've taken aggressive action, we've seen improvement."

Despite ongoing challenges and their continued place on the list, the status of some WatchList species is improving, according to the new data, as broader awareness of their plight has spawned effective conservation action. Several species have benefited from federal protection under the Endangered Species Act (ESA) and now show stabilizing, or even increasing populations. Lacking an ESA designation or the political support needed to secure strong protective measures, others continue to decline.

"Habitat loss due to development, energy exploration and extraction, and the impact of global warming remain serious threats for the most imperiled species, along with others on both the red and yellow lists," said Pashley. "Concerted action will be needed to address these threats."

Listed species may seem unfamiliar to many Americans. Unlike those on Audubon's recent survey of Common Birds in Decline, the species on WatchList are often rare and limited in range. In combination with population declines and new threats, these factors make many of them acutely vulnerable to extinction.

Among the most imperiled species on the list that regularly breed in the continental U.S. are:

Gunnison Sage-Grouse (not on ESA list)

This species is restricted to Southwest Colorado and adjacent Utah. Drought, which is predicted to get worse with increased global warming, is among the factors that have reduced the Gunnison Sage-Grouse population to fewer than 5,000; habitat loss and fragmentation and excessive grazing are other threats. Protection and restoration of contiguous tracts of good habitat is critical.

Lesser Prairie-Chicken (not on ESA list)

Habitat loss and degradation have restricted this species to a number of isolated populations, many of which are on private lands in Kansas, Colorado, Oklahoma, New Mexico, and Texas. Small population size, changing habitat resulting from drought, and climate change threaten continued survival.

California Condor (protected by ESA)

Once reduced to nine individual wild birds, this raptor is slowly recovering, thanks to captive breeding and the release of individuals in California and Arizona. There are now 305 individuals, including 148 free-flying birds. Lead bullets are a critical threat to long-term survival, as fragments poison wild condors that eat the remains of hunters' kills. Audubon California and American Bird Conservancy have spearheaded recent passage of legislation eliminating lead bullets in the range of the condor in that state.

Whooping Crane (protected by ESA)

Unregulated shooting and loss of habitat reduced this species to fewer than 20 individuals around the turn of the 20th Century. Implementation of a recovery plan developed under the Endangered Species Act has resulted in more than a 1000% increase in population to over 200 individuals, and has spawned efforts to establish additional wild breeding populations.

Piping Plover (protected by ESA)

Protection of this shorebird's beachfront nesting grounds is helping to improve the outlook for this species. Human development along beaches, increased beach recreation, disturbance by pets, and increased predation require constant vigilance. Intensive conservation efforts supported by the Endangered Species Act have helped stabilize populations and allowed populations to increase in some regions of the Atlantic and Gulf coasts.

Black-capped Vireo (protected by ESA)

Suburban development, agricultural conversion, and fire suppression in Texas and Oklahoma have decreased available breeding habitat, reducing both the range and population size of this species. Increased predation near human development has further decreased populations, as has parasitism from Brown-headed Cowbirds, which lay their eggs in Black-capped Vireo nests, out-competing the vireo chicks. Innovative conservation efforts on public and private lands seem to be helping some populations recover.

Florida Scrub-Jay (protected by ESA)

Suburban-exurban sprawl and agricultural development have reduced habitat dramatically and isolated many populations. Maintaining natural wildfire regimes will be critical. Although ESA status has increased conservation efforts for this species, it has not been enough to stop loss of habitat.

Golden-cheeked Warbler (protected by ESA)

Breeding is restricted to the Edwards Plateau in Texas, where suburban sprawl and habitat destruction has greatly reduced population size. Winter habitat loss in southern Mexico and Central America may also be affecting populations. Innovative conservation strategies that protect and restore habitat in both the breeding and wintering grounds are underway and needed.

Kirtland's Warbler (protected by ESA)

Dependent on jack pine habitat in northern Michigan, this warbler species has increased more than 600% since the mid-1980s because of management plans implemented under the Endangered Species Act. Singing male counts in the spring have increased from 200 to almost 1,400 (and some singing males are now found in Wisconsin and Ontario). Wild land fire management, control of the parasitic Brown-headed Cowbird, and protection of wintering habitat in the Bahamas remain essential to long-term survival.

Ashy Storm-Petrel (not on ESA list)

Breeding populations are restricted to islands off the west coast of North America. Non-native nest predators and increased gull populations threaten breeding birds, and ocean pollution and overfishing threaten feeding birds.

Kittlitz's Murrelet (not on ESA list)

Breeding and feeding habitat seems to be linked to Alaska's tidewater glaciers, making this species very susceptible to climate change. Oil spills, coastal pollution, and increased disturbance also threaten this species.

Red-cockaded Woodpecker (protected by ESA)

Habitat loss from logging in the Southeast's long-leaf pine forests and suburban and agricultural development have isolated populations and greatly reduced overall population size. Protection strategies developed through the Endangered Species Act are helping populations in many places, but restoration of open long-leaf pine forest is desperately needed.

Spectacled Eider (protected by ESA)

Ingestion of lead shot is believed to be a major problem for this species, along with an increase in nest predation by foxes, mink, gulls, and jaegers in a warming Arctic. In addition, changing sea conditions

in winter are affecting the distribution of clams - a preferred winter food. Proposed oil development poses an additional and very significant threat.

Reddish Egret (not on ESA list)

This species forages along the Gulf Coast and is subject to human disturbance at beaches and at nesting sites. It is dependent on high quality coastal habitat for its food. Human coastal development and decreasing water quality are serious threats.

Black Rail (not on ESA list)

This species makes its home in shallow, grassy wetlands along the Atlantic Coast, San Francisco Bay, southern Great Plains and the Lower Colorado River, habitat that is vulnerable to human conversion to other uses, including agriculture or other development. A secretive bird, it needs further study to increase understanding of its natural history, ecological role and conservation needs.

Buff-breasted Sandpiper (not on ESA list)

Traveling each fall from Alaska to Argentina, this species is one of our champion long-distance migrants. Along the way, it faces a great variety of threats, from oil development on its Arctic breeding grounds to grassland conversion to soybean fields on its Argentinean wintering grounds. It needs protected grassy stopover sites all along its migration route.

Saltmarsh Sharp-tailed Sparrow (not on ESA list)

This tiny bird is restricted to a narrow band of saltmarsh along the Atlantic and Gulf Coasts. It is threatened on one side by human coastal developments and on the other by rising sea levels. With even one foot of sea-level rise from global warming, this species will need a lot of help to maintain sufficient habitat for its survival.

Tricolored Blackbird (not on ESA list)

A highly social species, this bird is found in freshwater wetlands in the Pacific states, mainly California. With loss of this habitat, this species increasingly relies on agricultural fields for nesting, leaving chicks vulnerable to the harvest of hay and other crops. Audubon California and other conservationists are working with farmers to maintain agricultural nesting habitat long enough each season to allow the blackbirds to successfully raise their young - potentially spelling the difference between survival and extinction for this highly specialized bird.

Yellow Rail (not on ESA list)

Rails are small, secretive birds that winter in wetlands along the Gulf and Atlantic Coasts. This species prefers to breed in wet grasslands across Canada and the northern tier of states from Minnesota to Maine. These grasslands are easily converted to other uses, so protection of high-quality habitat will be essential for this migratory bird's survival.

Xantus's Murrelet (not on ESA list)

This tiny seabird nests on islands off southern California. Conservationists are tackling the major threat on the nesting grounds - non-native predators like rats and mice. Global warming seems to wreak havoc with the water circulation and availability of food sources in the ocean, causing shortages for this and other coastal seabirds.

Conservation action is also needed beyond the mainland. Hawaii has the highest proportion of native species in peril, primarily because of the state's small land area and wide variety of introduced invasive

animal and plant species. In addition, the Hawaiian Islands are particularly vulnerable to global warming. Hawaiian species facing the greatest threats are highlighted in a special section of WatchList.

The combined WatchLists show that imperiled birds - whether on the U.S. mainland or in Hawaii - are vulnerable to many of the same environmental threats, including global warming, habitat loss, pollution, and non-native invasive species. Aggressive conservation action to address these challenges is essential to their survival. "Everyone, from conservation groups to policy-makers and birdwatchers, needs to take a hard look at these lists and use them to inform and hone our conservation approaches and funding priorities while there's still time," says Butcher. "It's astounding that several are so close to the edge but haven't even received Endangered Species Act protection-this list is a reminder that we need to act and act now."

"The WatchList sounds a real warning, but fortunately, when we put our minds and laws to it, as we did with the Bald Eagle, Whooping Crane and California Condor, we can make a difference," said Pashley.

Adapted from materials provided by National Audubon Society.

http://www.sciencedaily.com/releases/2007/11/071129083858.htm

Over 20 Million People Unnecessarily Exposed To Radiation From CT Scans Each Year, Study Suggests

Researchers at Columbia University Medical Center suggest in a new study that the potential carcinogenic effects from using CT scans may be underestimated or overlooked. (Credit: iStockphoto)

ScienceDaily (Nov. 29, 2007) — Computed Tomography (CT) scans are an increasingly used X-ray-based tool for providing a three-dimensional view of a particular organ or tissue. The value of CT scanning to diagnose injury, cancer and other health problems is undisputed. But are these scans being used too frequently, in some cases unnecessarily? What are the health consequences of having too many CT scans over the course of a person's life?

In a Nov. 29, 2007 article in The New England Journal of Medicine, David J. Brenner, Ph.D., and Eric J. Hall, Ph.D., from the Center for Radiological Research at Columbia University Medical Center, argue that the potential carcinogenic effects from using CT scans may be underestimated or overlooked. This is of particular concern, because perhaps one-third of all CT scans performed in the United States may not be medically necessary, the radiation researchers say.

It is estimated that more than 62 million CT scans per year are currently given in the United States, compared to three million 1980. Because CT scans result in a far larger radiation exposure compared with conventional plain-film X-ray, this has resulted in a marked increase in the average personal radiation exposure in the United States, which has about doubled since 1980, largely because of the increased CT usage.

It used to be widely believed that all radiological examinations were essentially harmless, because of the small amounts of radiation involved, but Drs. Brenner and Hall show that this is unlikely to be true for CT scans. In particular, Japanese atomic bomb survivors who were about two miles away from the explosions, actually received radiation doses quite similar to those from a CT scan.

Sixty years of study of these survivors have provided direct evidence that there will be an increased individual cancer risk, though small, for those who have this same dose of radiation from CT scans. Although the individual risk is small, the large number of CT scans currently being given may result in a future public health problem. In particular, Drs. Brenner and Hall suggest that, in a few decades, about 1½ to 2 percent of all cancers in the United States may be due to the radiation from CT scans being done now.

Defensive Medicine Leads to Overuse

Drs. Brenner and Hall suggest that the rapid increase in CT usage represents a potential public health problem in the United States that should be proactively addressed. This is particularly important for children, who are more sensitive than adults to radiation exposure. The issue arises, for example, when CT scans are requested in the context of so-called "defensive" medicine, or when scans are repeated as a patient passes through different parts of the medical system.

Compounding the issue, surveys suggest that the majority of radiologists and emergency-room physicians may not appreciate that CT scans are likely to increase the lifetime risk of cancer. Ultimately, the health care system, the doctor, and the patient (who can perhaps best track of the number of CT scans performed when dealing with multiple doctors) may have to share the burden of monitoring the appropriate dosage and number of scans.

Drs. Brenner and Hall suggest three strategies for proactively addressing the potential increased radiation risks associated with CT scans:

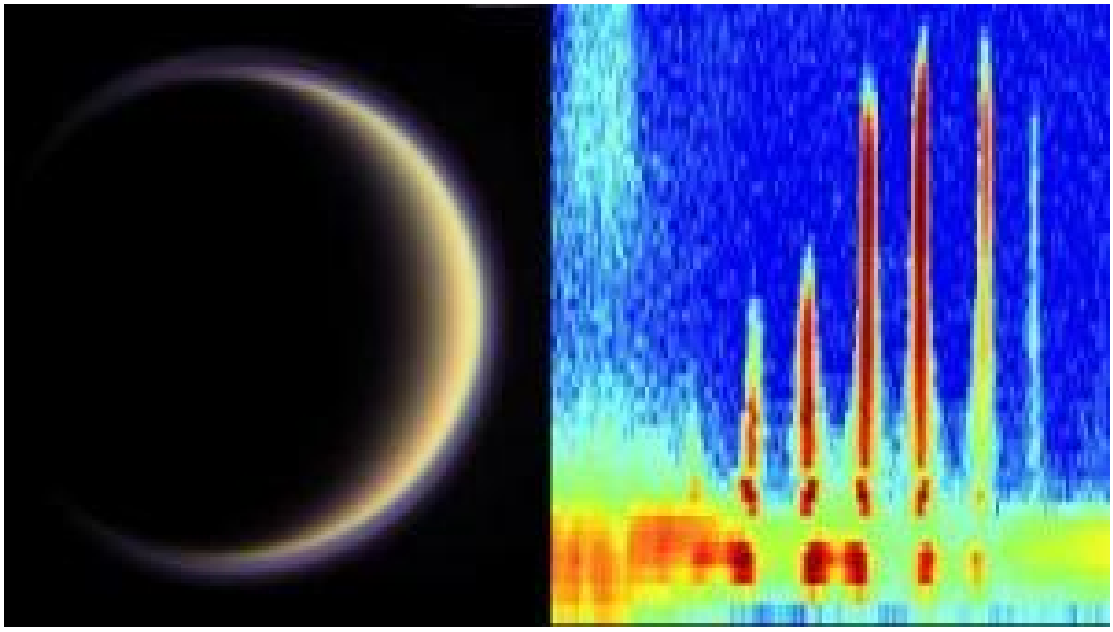
1. Reduce the CT-related radiation dose in individual patients.
2. Replace CT use, when appropriate, with other options that have no radiation risk, such as ultrasound or magnetic resonance imaging (MRI).
3. Decrease the total number of CT scans prescribed.

Drs. Brenner and Hall suggest in their paper's conclusion that these strategies could potentially keep 20 million adults and, crucially, more than one million children annually in the United States from being irradiated unnecessarily. They stress, however, that in the majority of individual cases, the benefits associated with a correct diagnosis through CT will far outweigh the individual risk.

Adapted from materials provided by Columbia University Medical Center.

http://www.sciencedaily.com/releases/2007/11/071128172402.htm

Organic 'Building Blocks' Of Life Discovered In Titan's Atmosphere



Saturn's moon Titan is the second largest in the solar system -- and the only one with a dense atmosphere. The atmosphere, nitrogen and methane, resembles that of the early Earth. NASA's Cassini spacecraft peered through the atmosphere, imaged the haze layers -- and ESA's Huygens probe landed on the surface. UCL-built equipment on the orbiter detects an unexpected component in Titan's high atmosphere -- extremely heavy hydrocarbon-based negative ions. Their mass is at least 10,000 times that of a hydrogen atom, detected at 953 km above the surface; about the distance from London to Milan. The image shows Titan's haze and the heavy ions. These are part of the haze in the atmosphere, and may fall towards Titan's surface as organic gunk. They are Carl Sagan's tholins; a brown residue appearing in the Miller-Urey experiment, where a spark excites a mixture of gases resembling that of Earth's early atmosphere. The right hand side of the image shows the negative ion signature at 4 different encounters, including T16 where we see the 10,000 amu ions. The vertical stripes show the ions seen as the instrument is scanned through Cassini's direction of travel and increasing numbers of ions are seen as they ram into our sensor. (Credit: Titan image courtesy NASA/JPL/Space Science Institute)

ScienceDaily (Nov. 29, 2007) — Scientists analysing data gathered by the Cassini spacecraft have confirmed the presence of heavy negative ions in the upper regions of Titan's atmosphere. These particles may act as organic building blocks for even more complicated molecules and their discovery was completely unexpected because of the chemical composition of the atmosphere (which lacks oxygen and mainly consists of nitrogen and methane). The observation has now been verified on 16 different encounters.

Professor Andrew Coates, researcher at UCL's Mullard Space Science Laboratory and lead author of a new paper*, says: "Cassini's electron spectrometer has enabled us to detect negative ions which have 10,000 times the mass of hydrogen. Additional rings of carbon can build up on these ions, forming molecules called polycyclic aromatic hydrocarbons, which may act as a basis for the earliest forms of life.

"Their existence poses questions about the processes involved in atmospheric chemistry and aerosol formation and we now think it most likely that these negative ions form in the upper atmosphere before moving closer to the surface, where they probably form the mist which shrouds the planet and which has hidden its secrets from us in the past. It was this mist which stopped the Voyager mission from examining Titan more closely in 1980 and was one of the reasons that Cassini was launched."

The new paper builds on work published in Science (May 11) where the team found smaller tholins, up to 8,000 times the mass of hydrogen, forming away from the surface of Titan.

Dr Hunter Waite of the South West Research Institute in Texas and author of the earlier study, said: "Tholins are very large, complex, organic molecules thought to include chemical precursors to life. Understanding how they form could provide valuable insight into the origin of life in the solar system."

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. NASA's Jet Propulsion Laboratory, a division of the California Institute of Technology, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington, D.C. The Cassini orbiter was designed, developed and assembled at JPL.

*These findings will be published in Geophysical Research Letters on November 28.

Adapted from materials provided by University College London.

http://www.sciencedaily.com/releases/2007/11/071128151808.htm

Dogs Can Classify Complex Photos In Categories Like Humans Do

Researchers have shown for the first time that dogs can classify complex color photographs and place them into categories in the same way that humans do. (Credit: iStockphoto/Rami Ben Ami)

ScienceDaily (Nov. 29, 2007) — Like us, our canine friends are able to form abstract concepts.Friederike Range and colleagues from the University of Vienna in Austria have shown for the first time that dogs can classify complex color photographs and place them into categories in the same way that humans do. And the dogs successfully demonstrate their learning through the use of computer automated touch-screens, eliminating potential human influence. In order to test whether dogs can visually categorize pictures, and transfer their knowledge to new situations, four dogs were shown landscape and dog photographs, and expected to make a selection on a computer touch-screen.

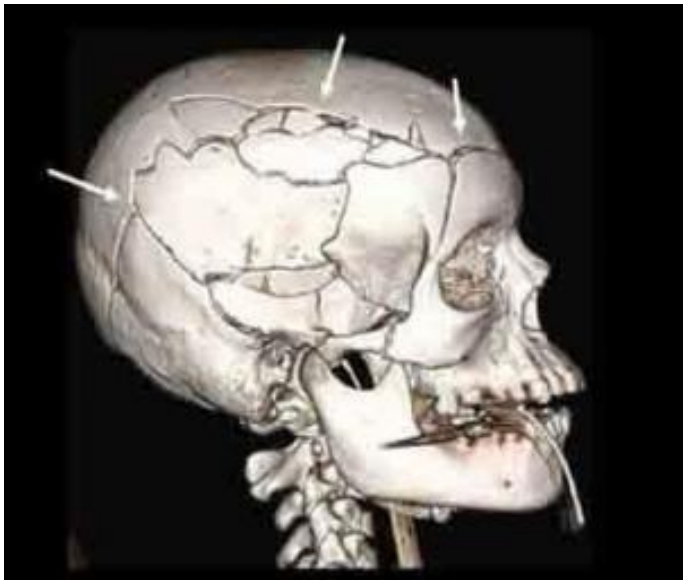
In the training phase, the dogs were shown both the landscape and dog photographs simultaneously and were rewarded with a food pellet if they selected the dog picture (positive stimulus). The dogs then took part in two tests.In the first test, the dogs were shown completely different dog and landscape pictures. They continued to reliably select the dog photographs, demonstrating that they could transfer their knowledge gained in the training phase to a new set of visual stimuli, even though they had never seen those particular pictures before. In the second test, the dogs were shown new dog pictures pasted onto the landscape pictures used in the training phase, facing them with contradictory information: on the one hand, a new positive stimulus as the pictures contained dogs even though they were new dogs; on the other hand, a familiar negative stimulus in the form of the landscape. When the dogs were faced with a choice between the new dog on the familiar landscape and a completely new landscape with no dog, they reliably selected the option with the dog. These results show that the dogs were able to form a concept i.e. 'dog', although the experiment cannot tell us whether they recognized the dog pictures as actual dogs. The authors also draw some conclusions on the strength of their methodology: "Using touch-screen computers with dogs opens up a whole world of possibilities on how to test the cognitive abilities of dogs by basically completely controlling any influence from the owner or experimenter." They add that the method can also be used to test a range of learning strategies and has the potential to allow researchers to compare the cognitive abilities of different species using a single method.

Journal reference: Range F et al (2007). Visual categorization of natural stimuli by domestic dogs (Canis familiaris). Animal Cognition (DOI 10.1007/s10071-007-0123-2).

Adapted from materials provided by Springer.

http://www.sciencedaily.com/releases/2007/11/071128105543.htm

Forensics Go High-tech With CT Autopsies



CT image shows multiple skull and facial bone fractures resulting from fatal blunt trauma to the head in a pedestrian struck by a car. Arrows point to some of the fractures. (Credit: Image courtesy of Radiological Society of North America)

ScienceDaily (Nov. 28, 2007) — Radiologists are investigating the use of computed tomography (CT) as a tool for civilian medical examiners' autopsies in the United States. According to findings presented November 27 at the annual meeting of the Radiological Society of North America, CT autopsy has the potential to replace conventional autopsy in determining the cause of certain accidental deaths.

"CT is a sensitive imaging tool for detecting injuries and cause of death in victims of blunt trauma," said Barry Daly, M.D., professor of radiology at the University of Maryland School of Medicine in Baltimore. "When there are major injuries, such as those resulting from a motor vehicle accident, CT may provide enough information to enable a conventional autopsy to be avoided altogether."

All states are required by law to perform an autopsy in cases of sudden and unexplained deaths. Of the 8,000 such deaths referred to the chief medical examiner of the state of Maryland last year, approximately one-half required full autopsy.

CT autopsy compares favorably to conventional autopsy in several ways. In cases of suspicious death, the noninvasive procedure does not damage or destroy key forensic evidence, as can happen during a conventional autopsy. In addition, CT can be used in situations where autopsy may be prohibited by religious or cultural beliefs. CT autopsy is considerably less expensive than conventional autopsy and can be performed in a fraction of the time. A forensic medical examiner requires several hours to conduct a full autopsy, while multi-detector CT scanning and interpretation can be completed in about 30 minutes.

In Dr. Daly's study, 20 autopsies were performed using whole-body multi-detector CT at the University of Maryland Medical Center.

Interpretations of the CT scans by two radiologists were compared with the results of a conventional autopsy performed on each body by state forensic medical examiners. Included were 14 victims of blunt trauma and six victims of a penetrating wound made either by a knife or ballistic weapon.

In all 14 blunt trauma cases and five of the six penetrating wounds, CT accurately identified the cause of death. The radiologists and forensic medical examiners evaluated the CT findings as comparable to conventional autopsy in 13 of the 14 blunt trauma cases and as a helpful adjunct in five of the six penetrating wound cases. In the study, CT was able to localize rapidly all 26 major ballistic fragments recovered from the victims during conventional autopsy.

"Autopsy is mandatory in deaths involving gunshot wounds, but CT can serve as a powerful adjunct to the conventional exam," Dr. Daly said. "Performing CT imaging first may speed up a conventional autopsy, especially when it comes to locating ballistic fragments, which are so important to criminal investigations."

In addition, CT was more sensitive than conventional autopsy in identifying air embolism, an often undetected important contributing factor in fatal trauma.

While CT has previously been used in autopsies of American soldiers and in a few countries outside the U.S., the technology is only now generating strong interest within the nation's forensic community.

"Although these preliminary results are promising, more research is needed to show that CT could be widely used within the U.S. medical examiners system," Dr. Daly said.

Co-authors are C.W. Sliker, M.D., D. Zulauf, R.N., J.L. Titus, M.D., P.A. Shah, M.D., M. Ripple, M.D., Z. Ali, M.D., and D. Fowler, M.D.

Adapted from materials provided by Radiological Society of North America.

http://www.sciencedaily.com/releases/2007/11/071127111143.htm

Cancer-resistant Mouse Developed By Adding Tumor-suppressor Gene

University of Kentucky researchers have found that mice born with the Par-4 gene do not develop tumors. (Credit: iStockphoto/Brandon Laufenberg)

ScienceDaily (Nov. 28, 2007) — A mouse resistant to cancer, even highly-aggressive types, has been created by researchers at the University of Kentucky. The breakthrough stems from a discovery by UK College of Medicine professor of radiation medicine Vivek Rangnekar and a team of researchers who found a tumor-suppressor gene called "Par-4" in the prostate.

The researchers discovered that the Par-4 gene kills cancer cells, but not normal cells. There are very few molecules that specifically fight against cancer cells, giving it a potentially therapeutic application.

Rangnekar's study is unique in that mice born with this gene are not developing tumors. The mice grow normally and have no defects. In fact, the mice possessing Par-4 actually live a few months longer than the control animals, indicating that they have no toxic side effects.

"We originally discovered Par-4 in the prostate, but it's not limited to the prostate. The gene is expressed in every cell type that we've looked at and it induces the death of a broad range of cancer cells, including of course, cancer cells in the prostate," said Rangnekar. "The interesting part of this study is that this killer gene is selective for killing cancer cells. It will not kill normal cells and there are very, very few selective molecules out there like this."

To further investigate the potential therapeutic benefits of this gene, Rangnekar's team introduced it into the egg of a mouse. That egg was then planted into a surrogate mother.

"The mouse itself does not express a large number of copies of this gene, but the pups do and then their pups start expressing the gene," Rangnekar said. "So, we've been able to transfer this activity to generations in the mouse."

The implications for humans could be that through bone marrow transplantation, the Par-4 molecule could potentially be used to fight cancer cells in patients without the toxic and damaging side effects of chemotherapy and radiation therapy.

"When a cancer patient goes to the clinic, they undergo chemotherapy or radiation and there are potential side effects associated with these treatments," Rangnekar said. "We got interested in looking for a molecule which will kill cancer cells and not kill normal cells, but also would not be toxic with regard to the production of side effects to the entire organism. We are thinking of this in a holistic

approach that not only would get rid of the tumor, but also not harm the organism as a whole. Before this animal study, we published a lot of work indicating that in cell culture, there's no killing of normal cells. This is the proof that it doesn't kill normal cells because the mouse is alive and healthy."

Rangnekar admits there is much more work to be done before this research can be applied to humans, but agrees that is the most logical next step.

"I look at this research from the standpoint of how it can be developed to the benefit of the cancer patient and that's really what keeps us focused all this time," said Rangnekar. "If you look at the pain that cancer patients go through, not just from the disease, but also from the treatment -- it's excruciating. If you have someone in your family, like I did, who has gone through that, you know you can see that pain. If you can not only treat the cancer, but also not harm the patient, that's a major breakthrough. That's happening with these animals and I think that's wonderful."

The research was published in the October edition of the journal Cancer Research. Dr. Rangnekar holds the Alfred Cohen, M.D., Endowed Chair in Oncology Research, and serves as the associate director (for translational research), at the Markey Cancer Center. It was funded by several grants from the National Institutes of Health.

Adapted from materials provided by University of Kentucky.

http://www.sciencedaily.com/releases/2007/11/071127080344.htm

Pedophilia May Be The Result Of Faulty Brain Wiring

ScienceDaily (Nov. 29, 2007) — Pedophilia might be the result of faulty connections in the brain, according to new research released by the Centre for Addiction and Mental Health (CAMH). The study used MRIs and a sophisticated computer analysis technique to compare a group of pedophiles with a group of non-sexual criminals. The pedophiles had significantly less of a substance called "white matter" which is responsible for wiring the different parts of the brain together.

The study, published in the Journal of Psychiatry Research, challenges the commonly held belief that pedophilia is brought on by childhood trauma or abuse. This finding is the strongest evidence yet that pedophilia is instead the result of a problem in brain development.

Previous research from this team has strongly hinted that the key to understanding pedophilia might be in how the brain develops. Pedophiles have lower IQs, are three times more likely to be left-handed, and even tend to be physically shorter than non-pedophiles.

"There is nothing in this research that says pedophiles shouldn't be held criminally responsible for their actions," said Dr. James Cantor, CAMH Psychologist and lead scientist of the study, "Not being able to choose your sexual interests doesn't mean you can't choose what you do."

This discovery suggests that much more research attention should be paid to how the brain governs sexual interests. Such information could potentially yield strategies for preventing the development of pedophilia.

A total of 127 men participated in the study; approximately equal numbers of pedophiles and non-sexual offenders.

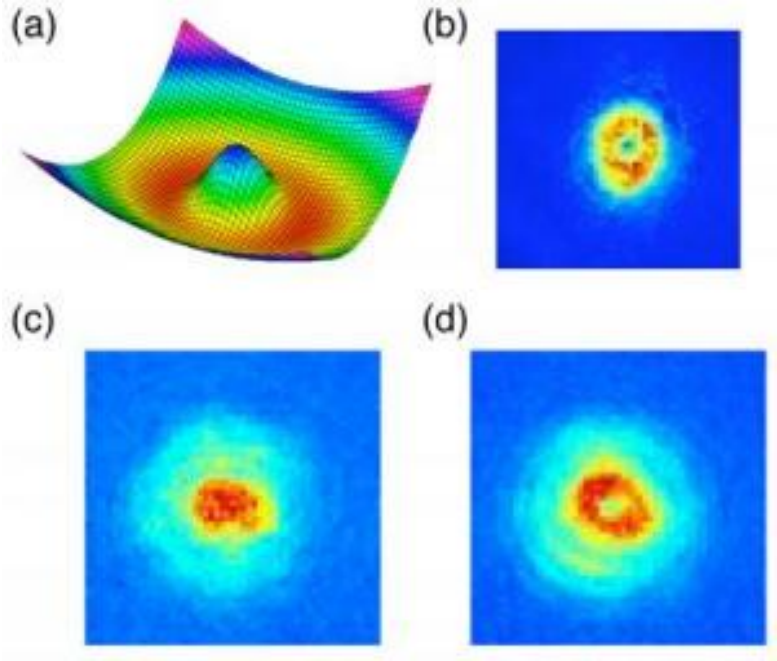
The Kurt Freund Laboratory at CAMH was established in 1968 and remains one of the world's foremost centres for the research and diagnosis of pedophilia and other sexual disorders.

CAMH is a Pan American Health Organization/World Health Organization Collaborating Centre, and is fully affiliated with the University of Toronto.

Adapted from materials provided by Centre for Addiction and Mental Health.

http://www.sciencedaily.com/releases/2007/11/071128092109.htm

First Observation Of 'Persistent Flow' In A Gas



(a) In a donut, shaped, or "toroidal" trap, atoms mostly exist in a red ring and do not reside in the center (blue region), which represents an energy hill they cannot climb. (b) Image of a Bose-Einstein condensate (BEC) in the donut trap. (c) When there is no fluid flow around the donut and the trap is turned off, atoms (red) rush to the center. (d) When fluid flows around the donut and the trap is turned off, the current around the donut persists and does not rush to fill the hole. (Credit: NIST)

ScienceDaily (Nov. 29, 2007) — Using laser light to stir an ultracold gas of atoms, researchers at the National Institute of Standards and Technology (NIST) and the Joint Quantum Institute (NIST/University of Maryland) have demonstrated the first "persistent" current in an ultracold atomic gas --a frictionless flow of particles. This relatively long-lived flow, a hallmark of a special property known as "superfluidity," might help bring to the surface some deep physics insights, and enable super-sensitive rotation sensors that could someday make navigation more precise.

To carry out the demonstration, the researchers first created a Bose-Einstein condensate (BEC), a gas of atoms cooled to such low temperatures that it transforms into matter with unusual properties. One of these properties is superfluidity, the fluid version of superconductivity (whereby electrical currents can flow essentially forever in a loop of wire). Although BECs in principle could support everlasting flows of gas, traditional setups for creating and observing BECs have not provided the most stable environments for the generally unstable superfluid flows, which have tended to break up after short periods of time.

To address this issue, the NIST researchers use laser light and magnetic fields on a gas of sodium atoms to create a donut-shaped BEC--one with a hole in the center--as opposed to the usual ball- or cigar-shaped BEC. This configuration ends up stabilizing circular superfluid flows because it would take too much energy for the hole--containing no atoms--to disturb matters by moving into the donut--which contains lots of atoms.

To stir the superfluid, the researchers zap the gas with laser light that has a property known as orbital angular momentum. Acting like a boat paddle sweeping water in a circle, the orbital angular momentum creates a fluid flow around the donut. After the stirring, the researchers have observed the

gas flowing around the donut for up to 10 seconds. Even more striking, this persistent flow exists even when only 20 percent of the gas atoms were in the special BEC state.

This experiment may provide ways to study the fundamental connection between BECs and superfluids. More practically, the technique may lead to ultraprecise navigation gyroscopes. A BEC superfluid is very sensitive to rotation; its flow would change in fixed steps in response to small changes in rotation. Sound too impractical for airplane navigation" Research groups around the world already have taken the first step by demonstrating BECs on a chip.

Journal reference: C. Ryu, M. F. Andersen, P. Cladé, V. Natarajan, K. Helmerson and W.D. Phillips, Observation of persistent flow of a Bose-Einstein condensate in a toroidal trap. Physical Review Letters. (forthcoming)

Adapted from materials provided by National Institute of Standards and Technology.

http://www.sciencedaily.com/releases/2007/11/071127153345.htm

Radiation Exposure Of Pregnant Women More Than Doubles In Ten Years

ScienceDaily (Nov. 29, 2007) — The past decade has seen an unprecedented increase in the use of radiologic exams on pregnant women, according to a study presented November 27 at the annual meeting of the Radiological Society of North America.

"Through medical imaging examinations, we are exposing pregnant women to twice the amount of radiation as we did 10 years ago," said Elizabeth Lazarus, M.D., assistant professor of diagnostic imaging at the Warren Alpert School of Medicine at Brown University in Providence, R.I. "Overall, the levels of radiation to which we are exposing pregnant women are low, but they do carry a slight risk of harm to the developing fetus." The researchers conducted a retrospective review of selected imaging examinations -- nuclear medicine, computed tomography (CT) and plain-film x-rays -- performed at Brown to determine how often these imaging exams were utilized in pregnant women and the estimated resulting radiation dose to the fetus. Data were compiled for the years 1997 through 2006 and compared to the number of infant deliveries per year.

The investigators found that from 1997 to 2006, the number of imaging studies performed on pregnant women increased by 121 percent. The greatest increases were in the number of CT exams, which deliver more radiation than many other radiologic procedures. An abdominal CT exposes the patient to a radiation amount more than twice that of an x-ray of the lower gastrointestinal tract. An abdominal ultrasound exposes the patient to no ionizing radiation. CT is not routinely used in pregnancy, but pregnant women may undergo CT to detect suspected life-threatening conditions such as bleeding in the brain, blood clots in the lungs or appendicitis. Since CT exposes the developing fetus to radiation, concerns are often raised regarding overuse. The majority of CT examinations (approximately 75 percent) analyzed in the study were performed in areas of the mother's body separate from the uterus, so the fetus was not exposed to any direct radiation. Even low levels of radiation have been shown to carry a small risk of harm to a developing fetus.

"While performing CT exams during pregnancy is still uncommon, we found that pregnant women are being recommended for CT more often over the last 10 years," Dr. Lazarus said. The researchers evaluated 5,235 examinations on 3,249 patients. During the 10 years of the study, the number of patients imaged per year increased from 231 to 447, and the number of exams per year increased from 325 to 730. This represented an 89 percent increase in patients and a 121 percent increase in examinations over the course of the study. During the same 10 years, the number of deliveries only increased from 8,661 to 9,261, a rise of only 7 percent or less than 1 percent annually.

Use of plain-film x-rays increased an average of 7 percent per year, and the number of nuclear medicine examinations rose by approximately 12 percent annually. CT examinations increased by approximately 25 percent per year. The average estimated fetal radiation exposure for CT was 0.69 rads, compared to 0.04 rads for nuclear medicine and 0.0015 rads for plain-film x-rays. Other studies have shown that use of high-tech modalities, such as CT and magnetic resonance imaging (MRI), has increased in all patient populations throughout the United States. According to Dr. Lazarus, some of this increase is due to the development of new imaging techniques to better diagnose abnormalities, and some is due to motivation by hospitals and insurers to make fast diagnoses to shorten hospital stays and improve patient care. Dr. Lazarus cautions healthcare consumers to be aware of this trend. "I want to assure patients that CT can be a safe, effective test for pregnant patients," she said. "However, there are alternatives that should at least be explored. Pregnant patients should ask their doctors about other imaging or diagnostic tests that may not expose the fetus to radiation."

Co-authors are C. Debenedectis, M.D., W. Mayo-Smith, M.D., and Patricia Spencer, M.D.

Adapted from materials provided by Radiological Society of North America.

http://www.sciencedaily.com/releases/2007/11/071127120503.htm

Climate Change And Life In The Southern Ocean

Germen Research vessel Polarstern in Atka Bay, Antarctica. (Credit: Jonas Ziegler, Alfred Wegener Institute)

ScienceDaily (Nov. 29, 2007) — A ten-week expedition to the Lazarev Sea and the eastern part of the Weddell Sea opens this year's Antarctic research season of the German research vessel Polarstern. On the evening of November 28, just some two hours after an official ceremony at the Berlin Museum of Natural History honouring Polarstern's 25th anniversary of service, the research vessel will begin its 24th scientific voyage to the Southern Ocean from Cape Town.

The 53 scientists from eight nations aboard Polarstern will focus much of their work on climate-related research as part of the International Polar Year. In addition, Polarstern will also supply the German Neumayer Station during the first leg of the trip, and accompany the freighter 'Naja Arctica' which will deliver construction materials for the new research station Neumayer III to the Antarctic. On February 4, 2008, Polarstern is expected to return to Cape Town.

"Our research projects will improve the understanding of physical and biological processes associated with the Antarctic Circumpolar Current and the Weddell Gyre, both of which play a key role for the earth's climate", explains chief scientist Prof Dr Ulrich Bathmann of the Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association, referring to the central goal of the expedition.

Plankton algae from these two marine currents south of the Atlantic Ocean are absorbing significant amounts of the climate gas carbon dioxide through their growth during the summer. By sinking to the Antarctic deep sea, these algae are subsequently transferring the carbon dioxide to the seafloor, where, in some cases below 4000 meter water depth, they provide food for bottom dwelling organisms. "The efficiency of this biological pump is controlled, for example, by nutrients, by physical dynamics in the ocean surface layer, and by the species of algae involved", says Bathmann. "We have to investigate these complex interactions further, in order to optimise scientific climate predictions."

The region covered by Polarstern during this mission extends from 40 to 70 degrees southern latitude, i.e. from the so-called subtropical convergence, a hydrological boundary separating the Antarctic from the Atlantic Ocean, and the Antarctic continent. The scientific studies aboard Polarstern, aside from being highly relevant for climate research, are part of three large international programmes within the International Polar Year framework.

The research programme SCACE (Synoptic Circum-Antarctic Climate and Ecosystem Study) explores physical and biological interrelations in the Antarctic Circumpolar Current, comparing recently recorded parameters with historical data. "The Antarctic Circumpolar Current measures several hundred kilometres across, surrounding the Antarctic continent and connecting all large oceans", explains Ulrich Bathmann. "This large ocean current transports both heat energy and fresh water, plays a central role in the ocean-wide cycles of dissolved material, and contains a series of distinct ecosystems that may displace each other with changing climate regimes. Plankton algae involved have a high potential for absorbing atmospheric carbon dioxide", the marine biologist adds about the significance of the Antarctic Circumpolar Current for the functioning of the system Earth.

At the same time, Southern Ocean natural systems themselves are extremely sensitive to global changes. Hence, one of the central tasks of the SCACE programme will consist in collecting a unique data set that can serve as a benchmark for comparison with existing data to identify and quantify polar changes.

A special role for food webs in the Southern Ocean is played by krill. This group of crustaceans, which may also become interesting for economic purposes, has been relatively well studied in some few regions of the Antarctic, for instance surrounding the Antarctic Peninsula. However, as some of the results revealed, the krill's seasonal survival mechanisms show large regional variation, so extrapolations from local studies to a wider area are hardly possible. For this reason, the research project LAKRIS (Lazarev Sea Krill Study) will be a detailed investigation into the life cycle, distribution and physiology of krill populations in the Lazarev Sea.

According to existing information, krill is very abundant in this area. "In this case also, our primary question of interest is the krill's ability to adapt to potential environmental changes", explains Ulrich Bathmann the connection to climate research. The LAKRIS study will complement similar large-scale investigations in other regions of the Antarctic.

While the continental shelf regions surrounding Antarctica are relatively well known, the Antarctic deep sea remains practically unexplored. Large areas of the seafloor around Antarctica, however, are deep-sea environments. Led by Prof Dr Angelika Brandt of the Zoological Institute of the University of Hamburg the third expedition project, ANDEEP-SYSTCO, tries to shed light on this unknown world. The acronym envelops an Antarctic deep-sea research programme, exploring various regions of the Southern Ocean at several thousand meters of depth with the primary goal of analysing interactions among atmosphere, water column and seafloor.

"Since deep sea research continues to take us to unknown worlds, we are expecting some new and fascinating insights regarding biological diversity in the ocean, perhaps even the discovery of previously unknown species", explains Bathmann. The Polarstern expedition thus is part of two major global research initiatives studying marine biodiversity: the 'Census of Antarctic Marine Life' (CAML), and the 'Census of the Diversity of Abyssal Marine Life' (CeDAMar), both of which are sub-programmes of the so-called 'Census of Marine Life'.

Adapted from materials provided by Alfred Wegener Institute for Polar and Marine Research.

http://www.sciencedaily.com/releases/2007/11/071127121334.htm

Live Kidney Donors Report High Satisfaction Rates And Minimal Health Problems

ScienceDaily (Nov. 29, 2007) — Live kidney donors suffer minimal health problems and 90 per cent would strongly encourage other people to a become a donor if a partner or family member needed a transplant, according to a study of more than 300 people published in the December issue of the UK-based urology journal BJU International.

Researchers from Egypt, where live donations are currently the only legal option, carried out detailed evaluations of 339 patients who attended follow-up clinics between January 2002 and January 2007.

Based at a centre which performs about 100 live donor transplants a year, they included patients who had donated kidneys between 1976 and the end of 2001 in their research.

"Living donors remain the main option in developing countries where donations from dead donors have yet to establish roots, because of the lack of infrastructure or the implementation of legal criteria for brain death" explains lead author Dr Amgad E El-Agroudy from the Urology and Nephrology Center at Mansoura University.

"Even in developing countries, the increasing demand for kidneys has resulted in a rapid increase in the number of living donors being used. This had led to concerns about the risk involved in the procedure and its long-term consequences."

All of the people who took part in the study underwent an extensive physical and psychosocial assessment, which included a full range of laboratory tests and detailed medical history. Any medical problems were then compared with health tables for the general population.

The researchers found that the live donors studied had good kidney function and tended to suffer a lower incidence of high blood pressure, diabetes and heart-related deaths than the general Egyptian population.

However, the authors point out that donors have to have good general health, at the time of the transplant, including normal blood pressure, to even be considered for the procedure and this could account for some of the results.

90 per cent of the donors who took part in the study said that they would make the same decision again if a family member or partner needed a kidney and would strongly encourage others to become donors.

47 donors went on to have 65 babies between them, including 25 who had their first baby after surgery

1,200 kidney transplants using live donors are carried out in Egypt every year, where the incidence of end-stage kidney disease is 200 people in every million.

In the current study, almost two-third of the donors (62 per cent) were women and the sample included people who had donated five to thirty years ago, with an average gap of 11 years between surgery and follow-up.

37 per cent had donated a kidney to their child, 47 per cent to a brother or sister and 16 per cent to a spouse or partner.

60 per cent were working at the time of the donation and 67 per cent had a moderate financial income. No-one reported losing their job as the result of the surgery and only one person said it has put them at a financial disadvantage.

"Our conclusion is that living kidney donation is a safe procedure with minimal long-term complications" says Dr El-Agroudy. "Overall kidney function is well maintained after one kidney has been removed and donor satisfaction is consistent.

"It is important to point out that the donors were all partners, spouses or relatives of the patients they donated their kidney to and that they all underwent comprehensive medical screening before they were accepted onto our transplant programme.

"We believe that making sure that living kidney donors receive long-term follow-ups is very important and we would urge all transplant centres to establish programmes like ours to monitor their ongoing progress."

"The authors have quite rightly identified a significant increase in live kidney donations in countries that also accept organ donations from deceased donors" says BJU International's Editor, Professor John Fitzpatrick from University College Dublin, Ireland.

"In the UK for example, NHS figures state that live kidney donations now account for one in four kidney transplants in the UK and 690 were carried out in 2006-7, a 50 per cent increase on 2003-4.

"The Journal was keen to publish this study from a country that relies exclusively on living kidney donors as the authors had the opportunity to follow up a large number of transplants carried out between five and 30 years ago."

Journal referenced: Long-term follow-up of living kidney donors: a longitudinal study. El-Agroudy et al. BJU International.100, p1351-1355. (December 2007).

Adapted from materials provided by Blackwell Publishing Ltd..

http://www.sciencedaily.com/releases/2007/11/071128113033.htm

Pill Boosts Platelets In Hepatitis C Patients

ScienceDaily (Nov. 29, 2007) — It's not a cure, but this may be some of the best news patients infected with the hepatitis C virus (HCV) have heard in a long time: A new drug, eltrombopag, appears to be effective in boosting low platelet counts, one of the major reasons why patients can't endure antiviral treatments.

Other drugs that can restore normal platelet functions are infusions or injections; eltrombopag is a pill taken just once a day.

Researchers at Duke University Medical Center and other centers world-wide studied eltrombopag (marketed as Promacta in the U.S. and Revolade in Europe by GlaxoSmithKline) in 74 patients with low platelet counts and cirrhosis of the liver due to HCV infection. They found that it boosted platelet counts in a majority of patients at each of three dosage levels, enabling most of them to continue or start conventional antiviral treatment.

"We feel this is an important development for many people infected with the hepatitis C virus world-wide," says Dr. John McHutchison, professor of medicine and associate director of the Duke Clinical Research Institute. "A significant number of patients with HCV infection will at some point develop platelet problems that will compromise their getting the best treatments we have. Anything we can do to prevent that from happening would improve their care."

It's estimated that 4 million people in the U.S. and 170 million world-wide carry the hepatitis C virus. The virus causes inflammation and scarring in the liver, and while it is curable in about half of those who have it, it can lead to significant liver damage, liver cancer and death in others. HCV infection is a common cause of cirrhosis and the most common reason for a liver transplant.

Platelets are cells made in the bone marrow that are important in clot formation, and serious bleeding can occur if platelet levels fall too low. Some diseases, like HCV infection, can cripple the body's ability to manufacture platelets, but so can some medical treatments. Cancer patients, for example, can experience plummeting platelet levels when undergoing chemotherapy.

In the phase II, multi-center trial, participants were randomized to a control group or to receive 30, 50, or 75 milligrams of eltrombopag daily. The patients had platelet levels ranging from 20,000 to 70,000 (145,000 to 450,000 is normal).

A phase II trial is designed to test the safety and efficacy of a drug at different doses, and the Duke study found that eltrombopag worked in a dose-dependent manner, meaning that patients got a better response with increasing amounts of the drug. Seventy-four percent of those in the trial who took the lowest dose saw their platelet counts go up significantly, while 79 percent and 95 percent of the participants saw increases with the higher doses.

Eltrombopag does cause side effects. Some of the patients complained of headaches, dry mouth, abdominal pain and nausea.

"We are encouraged by these results and are already working on another multi-center, international, phase III trial where we hope these results will be confirmed," says McHutchison.

The findings appear in the New England Journal of Medicine.

The study was sponsored by GlaxoSmithKline, which manufactures eltrombopag. McHutchison and many of the coauthors also report having received grants, consulting, advisory or speaking fees from the company.

Colleagues who contributed to the study include Geoffrey Dusheiko, M.D., Royal Free Hospital, London; Mitchell Schiffman, M.D., Virginia Commonwealth University Medical Center; Maribel Rodriguez-Torres, M.D., Fundacion de Investigacion de Diego, San Juan; Samuel Sigal, M.D., Weill Medical College; Marc Bourliere, M.D., Hopital St. Joseph, Marseille; Thomas Berg, M.D., Charite, Berlin; Stuart Gordon, M.D., Henry Ford Hospital and Health System, Detroit; Fiona M. Campbell, B.Sc., GlaxoSmithKline, Greenford, UK; Dickens Theodore, M.D., M.P.H., GlaxoSmithKline, Research Triangle Park; Nicole Blackman, Ph.D. and Julian Jenkins, M.Sc.,GlaxoSmithKline, Philadelphia; and Nezam Afdhal, M.D., Beth Israel Deaconess Medical Center, Boston.

Adapted from materials provided by Duke University Medical Center.

http://www.sciencedaily.com/releases/2007/11/071128172408.htm

Stem-cell Therapies For Brain More Complicated Than Thought

ScienceDaily (Nov. 29, 2007) — An MIT research team's latest finding suggests that stem cell therapies for the brain could be much more complicated than previously thought.

MIT scientists report that adult stem cells produced in the brain are pre-programmed to make only certain kinds of connections- - making it impossible for a neural stem cell originating in the brain to be transplanted to the spinal cord, for instance, to take over functions for damaged cells.

Some researchers hope to use adult stem cells produced in the brain to replace neurons lost to damage and diseases such as Alzheimer's. The new study calls this into question.

"It is wishful thinking to hope that adult stem cells will be able to modify themselves so that they can become other types of neurons lost to injury or disease," said Carlos E. Lois, assistant professor of neuroscience in MIT's Picower Institute for Leaning and Memory.

In developing embryos, stem cells give rise to all the different types of cells that make up the body--skin, muscle, nerve, brain, blood and more. Some of these stem cells persist in adults and give rise to new skin cells, stomach lining cells, etc. The idea behind stem-cell therapy is to use these cells to repair tissue or organs ravaged by disease.

To realize this potential, the stem cells have to be "instructed" to become liver cells, heart cells or neurons. The MIT study, which looked only at adult neural stem cells, suggests it will be necessary to learn how to program any kind of stem cell--embryonic, adult or those derived through other means--to produce specific types of functioning neurons. Without this special set of instructions, a young neuron will only connect with the partners for which it was pre-programmed.

The adult brain harbors its own population of stem cells that spawn new neurons for life. The MIT study shows that a neural stem cell is irreversibly committed to produce only one type of neuron with a pre-set pattern of connections. This means that a given neuronal stem cell can have only limited use in replacement therapy.

"A stem cell that produces neurons that could be useful to replace neurons in the cerebral cortex (the type of neurons lost in Alzheimer's disease) will be most likely useless to replace neurons lost in the spinal cord," said Lois, who also holds an appointment in MIT's Department of Brain and Cognitive Sciences. "Moreover, because there are many different types of neurons in the cerebral cortex, it is likely that we will have to figure out how to program stem cells to become many different types of neurons, each of them with a different set of pre-specified connections."

"In the stem cell field, it is generally thought that the main limitation to achieve brain repair is simply for the new neurons to reach a given brain region and to ensure their survival. Once there, it has been assumed that stem cells will 'know what to do' and will become the type of neuron that is missing. It seems that is not the case at all. Our experiments indicate that things are much more complicated," Lois said.

Lois and colleagues from MIT's departments of Brain and Cognitive Sciences and Biology found that the stem cells give rise to neurons that become a very specific neuronal type that is already pre-specified to make a very defined set of connections and not others.

Even if the stem cells are transplanted to other parts of the brain, they do not change the type of connections they are programmed to make.

"This suggests that we will have to know much more about the different types of neuronal stem cells, and to identify the characteristic features of their progeny," Lois said. "We may need to have access to many different types of 'tailored' stem cells that give rise to many different types of neurons with

specific connections. In addition, we may need a combination of several of these tailored stem cells to eventually be able to replace the different types of neurons lost in a given brain region.

The full study was published in the Public Library of Science (PloS) Biology on Nov. 13.

Lois' colleagues are Picower Institute postdoctoral fellow Wolfgang Kelsch, lead author of the work; biology undergraduate Colleen P. Mosely, and Brain and Cognitive Sciences graduate student Chia-Wei Lin.

This work is supported by the National Institutes of Health.

Adapted from materials provided by Massachusetts Institute of Technology.

http://www.sciencedaily.com/releases/2007/11/071127123927.htm

Effects Of Progesterone On Alzheimer's Disease

ScienceDaily (Nov. 28, 2007) — The first study on progesterone and Alzheimer's disease has found no clear preventive benefit for the widely prescribed hormone in an animal model.

Progesterone is given with estrogen in hormone replacement therapy. Previous studies have suggested that estrogen offers women some protection against Alzheimer's disease.

The study's authors, led by gerontologist Christian Pike of the University of Southern California, asked if the same could be true of progesterone.

In a study highlighted in this week's issue of the Journal of Neuroscience, Pike's group reports that progesterone has only limited benefit for mice with Alzheimer's symptoms when taken alone.

When taken with estrogen, progesterone actually inhibits some of the other hormone's beneficial effects, the study found.

The problem is not necessarily progesterone itself, Pike said. It could be the constant daily dosage, which fails to replicate the pre-menopausal body's natural cycles of hormone production.

"This is probably not the best way to be delivering progesterone," Pike said. "Giving a constant dose of progesterone appears to antagonize a lot of the beneficial effects of estrogen."

Pike's group tested progesterone on female mice whose hormone production had been blocked to simulate menopause. The mice, which were genetically predisposed to develop an Alzheimer's-like disease, showed symptoms within months.

Treatment with estrogen reversed the symptoms, Pike's group reported. Treatment with progesterone did not.

When the two hormones were given together, progesterone appeared to hinder estrogen's main beneficial function: preventing the buildup of beta amyloid protein, the key risk factor in Alzheimer's.

"Estrogen no longer decreases the amount of beta amyloid" when progesterone is present, Pike said.

Progesterone's effects were not all bad, Pike added. The hormone appeared to inhibit tau hyperphosphorylation, another chemical process implicated in Alzheimer's.

Progesterone also is known to counteract the increased risk of endometrial cancer from estrogen therapy, which is one reason most women receive both hormones.

Pike said his group's study should provide guidance for the design of human trials studying hormone therapy and Alzheimer's. He added that future studies might need to focus both on the dosage and the formulation of progestins -- the synthetic versions of progesterone given to humans -- as well on the starting age for hormone therapy.

Prior to the study, "we really had no idea what the progestins were doing," Pike said.

The study was funded by the National Institute on Aging under a large grant to USC's Roberta Brinton, (Progesterone in Brain Aging and Alzheimer's Disease), who is leading a university-wide effort to study the effects of hormone therapy on women's health.

Doctors prescribe hormone therapy to counter some of the harmful consequences of menopause, such as losses in bone density. But other large studies have shown that hormone therapy also increases the risk of breast cancer.

"Our study mirrors to some extent recent clinical observations in women that hormone therapy appears to have both beneficial and deleterious effects," Pike said.

The other authors of the study were USC graduate students Jenna Carroll and Emily Rosario along with Lilly Chang, research lab specialist in obstetrics and gynecology at USC, Frank Stanczyk, professor of research in obstetrics and gynecology at USC and neurobiologists Salvatore Oddo and Frank LaFerla at the University of California, Irvine.

Adapted from materials provided by University of Southern California.

http://www.sciencedaily.com/releases/2007/11/071127173334.htm

Nuclear Energy Research Moves Toward Greater Reliance On Computer Simulation

ScienceDaily (Nov. 28, 2007) — The U.S. Department of Energy's Argonne National Laboratory is taking its nuclear energy research into new territory -- virtual territory that is.

With the recent arrival of the new IBM Blue Gene/P and the lab's development of advanced computer models, Argonne has a critical role in making it possible to burn repeatedly nuclear fuel that now sits as waste, thus closing the nuclear fuel cycle and reducing the risk of nuclear proliferation.

The move toward greater reliance on computer simulation and modeling to conduct nuclear energy research is a progressive trend seen in other areas of scientific research supported by DOE.

"High-speed supercomputers are increasingly tackling difficult problems that could once be addressed only in a laboratory setting," Argonne Director Robert Rosner said.

"The traditional approach to developing nuclear energy technologies is to do a bunch of experiments to demonstrate a process or reaction," said Mark Peters, deputy to the assistant laboratory director of applied science and technology and Argonne's program manager for the Global Nuclear Energy Partnership. "What Argonne is doing is creating a set of integrated models that demonstrate and validate new technologies, using a smaller number of experiments."

Moreover, "advanced simulation can greatly reduce facilities' costs by allowing us to better identify and target the physical experiments which underlie their design," said Andrew Siegel, a computational scientist at Argonne and the lab's nuclear simulation project leader.

Siegel and a team of Argonne computational scientists are in the throes of refining computer codes that will eventually be used to conduct the underlying scientific research that will support the development of next generation nuclear systems such as advanced fast reactors, Siegel said. "We will use advanced simulation to improve and optimize the design and safety of advanced fast reactors," he said.

The Sodium Fast Reactor (SFR) design, which was born at Argonne, is a key part of President Bush's Global Nuclear Energy Partnership, a strategy that will significantly reduce the radioactivity and volume of waste requiring disposal and reduce the risk of nuclear proliferation. SFR designs are safe, capable of reducing the volume and toxicity of nuclear waste, and economically competitive with other electricity sources.

Using internal lab funding initially and GNEP funding more recently, Argonne computational scientists are designing a modern suite of tools called SHARP -- Simulation-based High-efficiency Reactor Prototyping, Siegel said. The SHARP toolkit is a collection of individual software components that digitally mimic the physical processes that occur in a nuclear reactor core, including neutron transport, thermal hydraulics and fuel and structure behavior, Siegel explained.

SHARP has been developed to fully leverage Argonne's new Advanced Leadership Computing Facility, which is made up of the Blue Gene/P, an IBM computer that is designed to operate at a sustained rate of 1-petaflop per second and capable of reaching speeds of 3 petaflops.

SHARP will build upon and may eventually replace existing computer codes that are used to conduct safety evaluations of today's portfolio of aging nuclear power reactors. Furthermore, those older codes, while adequate for evaluating the scoping designs of next generation reactors, are not as well-equipped to validate the performance of new reactor concepts now under design, Siegel said. A simulation tool like SHARP, which is being written specifically to test SFR design concepts, have the potential to shave off millions of dollars in reactor design development and construction, he said.

The kind of modeling and simulation work taking place at Argonne in support of the development of advanced nuclear energy systems is not by accident. "We see Argonne as the one place that can pull

off the creation of advanced simulation tools that will be able to successfully replace some types of experiments," Siegel said.

The reason: Argonne has the biggest concentration of scientists involved in fast reactor design and fuel reprocessing technologies -- expertise that is essential to refining SFR design concepts. "This is the center of brain power for nuclear energy research," Siegel said. Moreover, Argonne's nuclear engineers and chemical engineers have already been collaborating with the lab's computer scientists to develop precise computer simulations of the process of physical changes that would occur in an SFR, as well as other important aspects of the nuclear fuel cycle (e.g., separations and processing technologies).

Adapted from materials provided by DOE/Argonne National Laboratory.

http://www.sciencedaily.com/releases/2007/11/071126121729.htm

More than just a pop sensation

Rex Butler | *November 30, 2007*

SOME time after the death of pop artist Andy Warhol, undoubtedly the most important and influential artist of his generation, a fact emerged with the force of revelation: throughout his life he had been religious. Warhol not only had a family background steeped in a particular Slovakian Catholic worship of icons but he had regularly attended church throughout his adult life.

Section of Andy Warhol Self Portrait No. 9 1986

Only his closest friends knew of this side to Warhol, and he was surely aware that it did not sit well with the public image of him as the cynical parodist of consumerism, the ringmaster of the kinky goings-on at his Factory, the speed-fuelled hipster in leather jacket, dark glasses and white wig.

In a way, knowing this about Warhol changes everything. His images of iconic figures such as Marilyn Monroe and Elvis Presley seem no longer to point to the emptiness of fame but instead aspire to something of their original presence. His obsession with celebrity suggests that movie stars and rock singers are our contemporary saints and gossip magazines their holy relics. We can see Warhol as an artist not of the disenchantment of the image, the inheritor of Charles Baudelaire's dire prediction of the "decrepitude of art", but of its re-enchantment, the attempt to restore something of its original magical power.

It is not surprising that at the time of his death in 1987 he had been working for about two years on a large series devoted to Leonardo da Vinci's The Last Supper, which depicts that moment in the biblical narrative when Christ reveals that one of the disciples gathered there will betray him, and gesturing towards the wine and bread laid out on the table prefigures the Eucharist, in which the faithful incorporate the holy spirit by symbolically consuming his flesh and blood.

It is something like this miracle of incarnation that occurs every time we take an image as real, when we see it not as the representation of something that is absent but as the presentation of an object that is now before us.

Throughout his career, Warhol explored three registers of the image that still have this phantasmic power over us and, sacrilegiously perhaps, sought to link their commonality. They are religious images, pornographic images and advertising images. In each, the image attempts to make us believe, to see or desire something that is not there, and ultimately to make us act in some way.

Looking at Warhol's oeuvre, it is remarkable how often the power of the image to produce the effect of reality, or the possibility of the image to be real, is played on. Throughout all of his silkscreens, photographs, films and even the paintings he made by urinating on sensitised canvas, he aimed at an image that miraculously brought itself about without human, or at least artistic, intervention. Theologians call this special type of image acheiropoietos - literally, not made by hand - and the great example of it was the religious relic Veronica's veil, on which the image of Christ's face was miraculously imprinted after it was used to wipe away his sweat while he was carrying the cross towards Calvary.

In his films, too, Warhol sought to capture actions that could not be faked, that actually took place: eating, crying, sleeping, shooting up drugs, all the way to the notorious film Blow Job, in which we stare up-close at the face of a man while he is being fellated, and whose tics and grimaces are meant to be as authentic as the orgasm that pornography shows as proof of its reality.

For a long time Warhol was seen as the ultimate postmodern artist, systematically undermining the conditions for art: talent, inspiration, taste, originality, the artist's signature, the difference between artistic and other kinds of objects.

In fact, we can see him leading us not towards the end of art but back towards its beginning: that moment when art was not yet aestheticised, historicised, put into a museum. It was when art as we know it did not yet exist and the artist was pledged to religious rather than aesthetic values.

The huge retrospective of Warhol's work due to open at the new Gallery of Modern Art in Brisbane next week takes place in the middle of this dramatic re-evaluation of Warhol's work.

The exhibition, typical of the gigantism of contemporary blockbusters, will include about 300 of Warhol's works, sourced from across the country and from the Andy Warhol Museum in Pittsburgh. It will include his well-known Campbell's Soup cans, his Marilyns, his film and rock stars, his electric chairs and car crashes, his cow wallpaper, his Chairman Maos, his Silver Clouds, one of his Last Suppers and an almost complete selection of his films.

The new GoMA, with its populism, its kids' activities and its wide open views on to the outside world, is the ideal place to undertake this rethinking of Warhol and the consequences of his work for 21st-century art.

Warhol's work has nothing to do with our usual understanding of art, and GoMA is so far the only gallery in Australia to grapple with the problem of what to do when the most interesting objects it shows are no longer art and no longer belong to a history of art.

Two great artists of the 21st century have understood very well this strange retrospective revolution Warhol brings about for art: American pop artist Jeff Koons and Britain's Damien Hirst. In Koons's Made in Heaven series, which features hard-core tableaus in which the artist and his wife have sex, we have gestures towards the pornographic as one of the few realms where the image still retains its credibility, and an association, in the same way as Warhol, of pornography with art's original religious vocation.

In Hirst's famous shark in a vitrine or his more recent diamond-encrusted skull, For the Love of God, we have again the attempt to produce objects that are there before us. They seek, either through their physical presence or economic worth, to do away with any effort to intellectualise them or allow us any distance from them.

In all of this, Warhol can be seen as the forerunner not of postmodernism but of the present moment in art that has come after postmodernism, the contemporary. It is a moment when theorising fades away before the sheer visual power of the work being made, when art no longer comes out of other art but is itself a thing in the world.

The paradox is that although the best art today is becoming more populist and aligned to the forms of mass culture - Koons and Hirst again, or the Japanese super-flat artist Takashi Murakami - the questions it

poses are becoming more complicated and more connected to long-running themes of Western civilisation.

We can only hope that the Gallery of Modern Art in this show manages to balance the two priorities: this is the true task confronting museums today. It must realise that the art it exhibits is increasingly doing away with the need for museums, while making the case that museums are the best place for this to be thought through.

Viewers going to the GoMA to see the Warhol retrospective should realise that they constitute a kind of test case for the continued viability of art.

The strange thing is that people will flock to see originals of works they have seen a thousand times before and that in most cases were copies of images taken from elsewhere.

But this familiarity doesn't stop worshippers gazing every Sunday at the icons of Christ in their church: the images have a magical ability to make them feel that they are looking at something that was actually there in their space.

Warhol is perhaps best known for his quip that in the future everybody will be famous for 15 minutes. The brilliant irony is that it's precisely by facing the obsolescence of art and fame, brought about by their constructions as products, that he achieved for himself a kind of immortality.

And he did so in the only form it has been possible: as an image.

Warhol and his Superstars is at the Gallery of Modern Art, Brisbane, December 8 to March 30.

http://www.theaustralian.news.com.au/story/0,,22844081-16947,00.html

The rebirth of painter David Park

By Alex Beam, Globe Columnist | November 28, 2007

The problem with posthumous success is - well, it's pretty obvious what the problem is. But the works of Boston-born artist David Park, who died at 49 in 1960, are finally enjoying some worldly renown.

The son of a Unitarian minister, Park grew up on Marlborough Street but never really cottoned to the cold roast New England lifestyle. "He simply ignored what disinterested him, which included school, church, and athletics, focusing his attention on drawing, painting, making puppet shows and playing the piano," according to the website "Notable American Unitarians." (!) At 17, Park lit out for California, quickly married and had two children.

In a last-ditch attempt to make peace with the Athens of America, Park taught painting for five years at the Winsor School for girls in the Fenway. Then he moved his family back to Berkeley and joined the Abstract Expressionist art movement. In 1949, he took all his paintings to the city dump (!!) and "introduced the style that would later be known as Bay Area Figurative Painting," a school that "became a distinctive West Coast style of expression," according to San Francisco's Hackett-Freedman Gallery, which has championed his work.

Twice this year, a David Park canvas has sold for more than $1 million, both records. First, at Sotheby's in May, and just this month, "Canoe" was sold to an unidentified California buyer for $1.8 million by Doyle New York. "It was interesting to see that large an increase within the year for David Park," said Harold Porcher, director of modern art at Doyle. "I was thinking it might fetch in the high $900,000s to $1.2 million. But there aren't a lot of these paintings out there."

"Of course I am as prejudiced as I can be," his daughter Natalie Schutz told me. "When I was growing up my father's work sold for $200 or $300, enough to pay the dentist bill and buy new shoes. If David Park, a man of great good humor, were alive today, he'd be rejoicing royally."

After he was diagnosed with terminal cancer, Park painted more than 100 gouaches in the last few months of his life. But his wonderfully colored canvases remain rare. My friends over at the Museum

of Fine Arts have a beautiful one, "Rowboat," but it's hanging in deputy director John Stanley's office. Free David Park!

Redefining Christmas

Meet richer-than-Croesus hedge fund manager Ray Dalio, from Greenwich, Conn. Dalio shares my sentiments about the sickening commercialization of Christmas, but he is in a position to do something about it.

For the second year running, Dalio is financing a national ad campaign that dares to say: "No sooner does Thanksgiving end, than the loathsome shopping season begins - a monthlong compulsion to buy something, anything, for anyone." In lieu of mobbing the malls, Dalio's ads urge you to "give people donations to their favorite charity. And request that they give donations to your favorite charities. A lot more money would go to people who need it."

Right on! Don't send me a fruitcake; give the money to People for the Ethical Treatment of Animals instead. (Use the website justgive.org.) Not only are charitable donations tax-deductible, but they make their way into the economy as goods and services that people need, not in the form of sweaters and never-to-be-read books. Last year, Dalio spent a million dollars in major newspaper ads; this year he will spend $2 million, and advertise each week in December, right up until you-know-when.

Dalio has a lot of money, and he gives a lot away. According to the IRS, his Dalio Family Foundation doled out almost $5 million in 2006 to about 300 different charities. The gifts range from $500 to Connecticut Public Broadcasting to $1 million "to support the good works of David Lynch and the Maharishi University." That must tick off the development wallahs at Harvard, where Dalio attended business school.

A spokesman said Dalio's family "had very little money, and they are very fortunate. They would like to remold the way Xmas works." Me, too.

Alex Beam is a Globe columnist. His e-dress is beam@globe.com ■

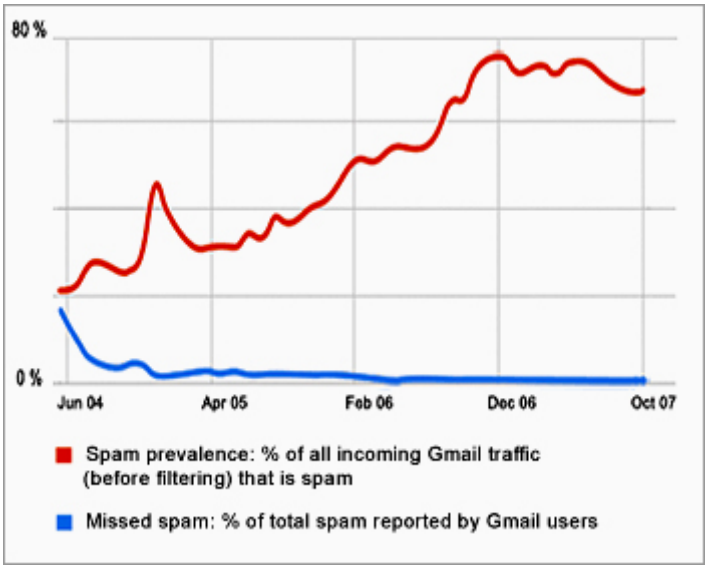
http://www.boston.com/ae/theater_arts/articles/2007/11/28/the_rebirth_of_painter_david_park/

Spammers Giving Up? Google Thinks So

By Betsy Schiffman 11.28.07 | 7:00 PM

Bill Gates was wildly optimistic when he said in 2004 that the problem of spam would be "solved" by 2006. The volume of junk e-mail transmitted worldwide is still enormous. But a remarkable trend is underfoot, according to Brad Taylor, a staff software engineer at Google: The number of spam attempts -- that is, the number of junk messages sent out by spammers -- is flat, and may even be declining for the first time in years.

Google won't disclose numbers, but the company says that spam attempts, as a percentage of e-mail that's transmitted through its Gmail system, have waned over the last year. That could indicate that some spammers have gotten discouraged and have stopped trying to get through Google's spam filters.



Google data suggests that incoming spam (the red line) has flattened or declined for the first time in years. (The blue line represents the percent of spam that is missed by Gmail filters and reported by users as arriving in their inboxes.)

Image: Google

Other experts disagree with Google, pointing out that overall spam attempts continue to rise. By most estimates, tens of billions of spam messages are sent daily. Yet for most users, the amount of spam arriving in their inboxes has remained relatively flat, thanks to improved filtering.

Brad Taylor is on the front lines of the war on spam. He has served as the chief watchdog of Google's spam filter since 2004, when Gmail first launched. His history with spam goes back much further, though: He's been fascinated with it since 1994, when he received his first spam e-mail at a work account. Before he joined Google, he worked at an anti-spam startup.

Taylor denies he's obsessed with junk mail, but his actions speak otherwise: For his own amusement, he Googles the gobbledygook at the bottom of spam messages to see where the text comes from. (Some are from Harry Potter books, he says. He also found one that was an English translation of a Russian science-fiction novel).

"It's fun," he says of catching spammers. "Sometimes I think, 'Oh, wow, that guy's really clever.'"

The chase may be exciting, but Taylor's real dream is to return e-mail to the "pristine experience it used to be."

Chenxi Wang, an analyst at Forrester Research, scoffs at the idea that spam attempts could be on the decline.

"I'm seeing that the overall trend is up," Wang says. "We're not seeing a drastic increase, though. And we're also seeing an increase of targeted spam instead of blanket spam that hits everybody in a large population. Today, for instance, you see spam messages on saving (on) prescription drugs targeted to seniors."

For its part, Yahoo, too, says the overall amount of spam transmitted is on the rise, but the percentage of spam that reaches its users' inboxes is down. (Yahoo would not disclose specific numbers.)

Regardless of the overall spam attempts, David Daniels, vice president of Jupiter Research, predicts the number of spam messages that actually reach a typical inbox will remain roughly flat over the next three years. And for most people, that's what really matters.

"We're forecasting that the number of spam messages that annually reach the average inbox will hit 4,351 in 2007. For 2010, we think that number will essentially be flat at 4,403. The growth will be very, very small," Daniels says.

There are a couple of reasons for the lack of growth in spam deliveries. For one, e-mail providers like Google, Yahoo, AOL and Microsoft's Hotmail use sophisticated filtering algorithms that are constantly updated based on spam reports from individual users. Google says it can delete all instances of a single spam message across the Gmail network in seconds.

New anti-spam technologies are also always under development, and there are already countless anti-spam services and technologies available to consumers, including disposable e-mail addresses.

It's by no means a perfect system, though. And spammers are, if nothing else, persistent.

In a bizarre twist, Daniels thinks that instead of receiving spam offers from penny-stock pushers, mailboxes will increasingly be filled with marketing messages that we *choose* to receive, such as promotional e-mails from a favorite clothing store or a bank. He thinks the average number of messages from marketers that individuals receive annually will grow from 2,715 in 2007 to 3,335 in 2010.

"We expect people to spend as much time on e-mail as they have, but we think people will receive more e-mail from legitimate marketers. So there will be more competition to get consumers' attention in the inbox, but it will be more like competition between The Gap and J.C. Penney as opposed to The Gap and a Viagra salesman."

Compiler: Too Much Spam? Turn it Into Poetry and Hang it on Your Wall

http://www.wired.com/print/techbiz/it/news/2007/11/google_spam

Hackers hijack web search results

By Mark Ward
Technology correspondent, BBC News website

A huge campaign to poison web searches and trick people into visiting malicious websites has been thwarted.

The booby-trapped websites came up in search results for search terms such as "Christmas gifts" and "hospice".

Windows users falling for the trick risked having their machine hijacked and personal information plundered.

The criminals poisoned search results using thousands of domains set up to convince search index software they were serious sources of information.

Innocent victim

While computer security researchers have seen small-scale attempts to subvert search results before now, the sheer scale of this attack dwarfed all others.

"This was fairly epic," said Alex Eckelberry, head of Sunbelt Software - one of the firms that uncovered the attack.

Mr Eckelberry said tens of thousands of domains were used in the vanguard of the attack. Most domains were Chinese registered, hosted in the US and were only a couple of days old.

Websites loaded on these domains were booby-trapped with malicious software that looked for vulnerabilities in copies of Microsoft's Internet Explorer used to browse them.

This is not going to go away
Alex Eckelberry

"If your machine was not fully patched you were going to get hosed," said Mr Eckelberry.

The criminals who bought the domains convinced the indexing software used by Google, MSN and Yahoo they were good and popular sources of information, said Mr Eckelberry.

Although the results were indexed by Yahoo and MSN the webpages were coded to only show up if someone used Google.

They accomplished this using comment spam on blogs to push the pages up the search index rankings.

Sunbelt had discovered malicious sites connected with search terms such as "hospice", "cotton gin and its effect on slavery", "infinity" and many more.

"You could be searching for really innocuous things and get nailed," said Mr Eckelberry. "There was really nasty stuff in there."

"If there's any message from this I can scream from the rooftops its make sure you patch your machine," he said.

Security firm Trend Micro also discovered a series of booby-trapped sites aimed at Christmas gift shoppers and those looking for information about many other innocent subjects.

"Some of the top rated hits are leading to the malicious sites," said Raimund Genes, chief technology officer at Trend Micro.

Mr Genes said the booby-trapped websites discovered by Trend Micro tried to exploit several different vulnerabilities in Microsoft's web browser. The sites also attempted to stop the malicious software being spotted by intermittently scrambling the package before it downloads.

He speculated that the campaign was being waged by the Russian Business Network - a hi-tech criminal gang known to favour web-based attacks.

The booby-trapped websites were thought to be in operation for about 24 hours before Google began stripping them out of its search index. Some of the trapped websites are believed to be still turning up in searches carried out on Yahoo and MSN Live.

But, said Mr Eckelberry, this attack was likely to be a harbinger of many more.

"This is not going to go away," he said.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/technology/7118452.stm

Published: 2007/11/29 11:31:27 GMT

Rapid chlamydia check developed
UK researchers have developed a new "while you wait" test for the sexually transmitted infection chlamydia, which can provide a result within 30 minutes.

A study of 1,300 women in three clinics found the test, which uses a vaginal swab, to be cheap and effective, the British Medical Journal reported.

Currently, tests have to be sent to a laboratory, leading to delays in diagnosis and treatment.

Currently one in 10 young people in the UK tests positive for the infection.

But on-the-spot diagnosis might improve the national chlamydia screening programme, experts said.

Opportunistic screening for men and women under 25 is currently being rolled out across England.

> **The hands on time is less than a minute and then you have to wait for it to develop**
> Dr Helen Lee

But some of those tested do not come back to get the results or may unwittingly infect others before they are diagnosed.

Chlamydia often produces no symptoms but if left untreated can result in complications such as pelvic inflammatory disease, ectopic pregnancy, and infertility.

Quick result

The new test can show a positive result in as little as 10 minutes, said researchers at the University of Cambridge.

It means women can receive the result while still at the clinic and receive treatment and start to contact sexual partners straight away.

The kit looks a bit like a pregnancy test and shows two blue lines for a positive result, one for a negative result and no line if the test has not worked.

Study leader Dr Helen Lee said: "The hands-on time is less than a minute and then you have to wait for it to develop.

"Women can do the swab themselves and they are happy with that."

She added: "In chlamydia control, the key is to screen a wider group of people and if people do not come to be tested you can take the test to them."

A US study found around 3% of women developed pelvic inflammatory disease when waiting 14 days for a test result.

Dr Lee said the test would not necessarily replace the current laboratory method but could be useful in some settings where there is poor uptake.

Penny Barber, chief executive of Brook in Birmingham, said: "What it means is someone gets their result through right away so they don't have the anxiety of waiting and if they are positive we can talk to them about telling their partner.

"From the clinic's point of view, the logistics of keeping track of a sample, sending them off to the lab, calling clients back in is all removed.

"There's a really good business case for clinics to use this - I'm hoping it will be available soon."

She added she couldn't see any reason why women could not use the tests at home.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7119102.stm

Published: 2007/11/30 01:21:55 GMT

Boozy patients drink NHS hand rub
Hospitals may need to keep their hand rub under lock and key to stop patients drinking it for its alcoholic content, say doctors.

Poison experts at London's Guy's and St Thomas' hospital received 19 reports of intentional ingestion over 16 months.

Accidental ingestion by children, and elderly and confused patients, was also a problem, they told the British Medical Journal.

Hand rubs are placed near bedsides to tackle hospital-acquired infections.

Health hazard

The toxicologists compared the number of inquiries to their poisons centre in London from other health professionals during 16-month periods before and after the widespread introduction of alcohol hand rubs in 2005.

This comparison revealed an increase in the total number (23 versus 50) of enquiries to the unit.

There was also a marked increase (7 versus 29) in adult ingestion numbers, 19 of which were thought to be due to intentional ingestion.

All cases of ingestion occurred within hospitals or care homes.

One of the reports related to a female patient with a known history of alcohol dependency who was found collapsed with an empty 500ml bottle of alcohol hand rub, lying next to another bottle.

The more serious effects are seen in those who ingest more than 500ml of hand rub
The study authors

Tests showed she was nine times over the legal UK driving limit for alcohol and the concentration in her blood was potentially fatal.

The researchers said: "In our experience, the more serious effects are seen in those who ingest more than 500ml of hand rub, and this is most likely to occur in confused patients (such as, they may mistake it for water) and those with alcohol dependency seeking the desired effect."

While poisoning from hand rubs remains relatively uncommon, it is on the rise, they said, and suggested larger hand rub dispensers (500ml or more) could be placed within locked secured holders preventing unintentional or intentional ingestion.

A spokesman from Alcohol Concern said: "Alcohol dependency is an addiction and, like any other addiction, can manifest itself in sometimes extreme and desperate measures on the part of the patient.

"In addition to managing risk in the short term, it's equally vital that hospitals have in place clear referral systems so that hospitalised patients can begin to address the root causes of this type of behaviour."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/health/7119247.stm

Published: 2007/11/30 00:53:15 GMT

UK schools slip down in science
The UK is above average in a major international league table on school science - but it has slipped compared to its previous top-four ranking.

Finland, Hong Kong and Canada were the top-rated countries for science.

The study of science ability among 15-year-olds in 57 countries ranked the UK between 12th and 18th place.

In 2000, the UK was in fourth place, but the organisers warn that comparing results in this three-yearly assessment is not "strictly valid".

When compared only with other members of the OECD in the Programme for International Student Assessment (Pisa) study, the UK came between 8th and 12th place - using a system which places countries within a range of rankings.

Top group

This places the UK's teenagers in a top group defined as "statistically significantly above the OECD average".

TOP SCIENCE RANKINGS
Finland
Hong Kong (China)
Canada
Estonia
Japan
New Zealand
Australia
Liechtenstein

The UK as a whole was not included in the last Pisa study, based on tests taken in 2003.

The preliminary findings of the Pisa study on science have been released early because of a leak to newspapers in Germany and Spain, but the full results and those for maths and reading skills will be published on Tuesday.

The initial results of the tests put Finland at the top for science, followed by Hong Kong (China), Canada, Chinese Taipei, Estonia and Japan.

Daily life

The Pisa survey is based on tests carried out in 2006 in 57 countries which together account for 90% of the world's economy.

It tested students on how much they knew about science and their ability to use scientific knowledge to address questions in daily life.

Although the organisers say comparisons between results from these tests and those of previous years are "not strictly valid", they say some countries moved "sharply upward".

These include Canada, Germany, Austria and Denmark.

The organisers give a country's position as being ranked between certain positions because it says with a sample of students it is not always possible to state a comparative ranking with 100% accuracy.

Instead, OECD calculates, with 95% confidence, a range of ranks that the country falls within.

Publication of the study comes just a day after England dropped from third place to 19th in the world in an assessment of reading.

The government says that the Pisa findings show that England is one of the countries with the largest numbers of high-achieving students.

But they also say the study shows a "wide range of achievement, with a large difference between the scores of the highest and lowest achievers".

Boys in England out-performed girls in the way they applied their science knowledge, officials say.

Four out of five students in England said science helped them to understand things around them, but only 38% said they liked reading about science - well below the OECD average.

And only 55% said they generally had fun when learning science - again below the OECD average.

But English students showed a confidence in their science abilities - with 72% saying they could give good answers to science test questions and 64% saying they could easily understand new ideas in science - above the OECD average.

Schools Minister Jim Knight said: "This study shows that we have performed well compared to other countries - and the best English teenagers are amongst the brightest in the world. We're well above average, but we know we need to do more to be truly world class.

SCIENCE LESSONS
79% say science helps them understand things
61% agree there will be many opportunities for them to use science when they are adults
34% said they would like to work in science

38% like reading about science
55% have fun learning science

"It's interesting that while most teenagers think science is useful and relevant to their future lives, not many of them say that science is fun or that they would choose it as a career.

"Next year, we will launch a new communications campaign and programme of science careers guidance to capture young people's imagination by showing them the futures available to those who study subjects like science and technology."

Shadow Schools Secretary Michael Gove, said: "Yesterday we slid down the international reading league table; today we plummeted down the international science league table. External audits are confirming what we have warned about.

"The government has failed to equip our children properly for the future by using tried and tested teaching methods. It has failed to keep us internationally competitive by making sure our exams are properly rigorous.

"We've had GCSE science questions in which students are asked if they should use a microscope to look at the moon, for example."

General Secretary of the National Union of Teachers, Steve Sinnott said: "While the results in Pisa 2006 are not comparable with previous Pisa studies there are some mixed messages from these initial findings.

"The ranking represents good news for schools. Nevertheless it has to be asked whether the over prescribed national curriculum in science has led to youngsters saying that they find science less fun than their peers in other countries."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/education/7119511.stm

Published: 2007/11/29 17:32:56 GMT

Bird flu cause probe inconclusive
The preliminary report into the latest outbreak of bird flu in Suffolk concludes that wild birds "may have been" the main source of infection.

But no evidence has yet been found to support this theory.

The report also found that poor biosecurity was practised by some of the staff on the farm where the outbreak occurred on 11 November.

This is thought to be the probable reason for the disease spreading to another farm.

The virulent H5N1 strain of the virus, a variant capable of being transmitted to humans, was first discovered at Redgrave Park Farm near Diss, where all 6,500 birds were slaughtered.

The disease was later also confirmed to have reached the nearby Hill Meadow Farm at Knettishall - 9,000 turkeys were culled there.

Two theories

The report concludes that the disease has a very close genetic match with an outbreak of H5N1 in the Czech Republic in the summer.

It says that there are two main theories about how the disease was introduced to the UK - either via contamination from people from a country with an undisclosed infection in their domestic flocks, or infected wild birds.

There is currently no evidence to support either theory.

"As there are no epidemiological links with domestic poultry in central Europe, the molecular genetic results suggest that wild birds may have introduced the virus into Suffolk from Europe," the report said.

The Department for Environment, Food and Rural Affairs (Defra) says the disease was discovered in an area where wild birds were relatively common and was notably near to an ornamental lake which supports some 1,000 waterfowl.

The affected poultry were free-range - meaning they had access to the outdoors and may have been at greater risk of catching the disease.

H5N1 infection has not been detected in wild birds nor have any incidents of high mortality been observed in the area, according to the report.

But it added that wild birds, most likely migratory species from central Europe, cannot be ruled out as the source of infection.

Poor biosecurity

The report also said poor biosecurity was employed by stockmen who worked at Redgrave Park Farm and on other farms in the area.

> **A migrating bird could have carried the disease here without showing symptoms but imported poultry could have done exactly the same**
> Dr Mark Avery

Simple measures to prevent the transmission of infection between premises were not followed, it said.

Such measures include changing clothing between premises, disinfection of Wellington boots, the disinfection between premises of buckets for the distribution of feed, and the carriage and handling of dead birds. Gressingham Foods' subsidiary Redgrave Poultry, which runs both Redgrave Park Farm and Hill Meadow said it had identified several changes that were needed when it purchased the farms at the start of the year.

It said: "Due to our commitments to our customers and the lack of available organic land, it was simply not practical to make all of the planned changes for this season.

"We believe in the highest standards of organic and free range farming for these production systems, so we have looked for lessons from the recent outbreak and have identified a number of improvements that we are implementing." Dr Mark Avery, conservation director for the RSPB, said imported poultry could have been the cause of the Suffolk outbreak.

"A migrating bird could have carried the disease here without showing symptoms but imported poultry could have done exactly the same.

"Defra and the poultry industry should be doing more to protect wild birds from coming into contact with infected farmed birds." Suffolk previously had an H5N1 outbreak at a turkey farm in February, but the report found there was no connection that incident.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/1/hi/uk/7118876.stm

Published: 2007/11/29 16:07:27 GMT

Ocean Fertilization 'Fix' For Global Warming Discredited By New Research

Ocean fertilization, the process of adding iron or other nutrients to the ocean to cause large algal blooms, has been proposed as a possible solution to global warming because the growing algae absorb carbon dioxide as they grow. (Credit: iStockphoto/Brett Hillyard)

ScienceDaily (Nov. 30, 2007) — Scientists have revealed an important discovery that raises doubts concerning the viability of plans to fertilize the ocean to solve global warming, a projected $100 billion venture.

Research performed at Stanford and Oregon State Universities suggests that ocean fertilization may not be an effective method of reducing carbon dioxide in the atmosphere, a major contributor to global warming. Ocean fertilization, the process of adding iron or other nutrients to the ocean to cause large algal blooms, has been proposed as a possible solution to global warming because the growing algae absorb carbon dioxide as they grow.

However, this process, which is analogous to adding fertilizer to a lawn to help the grass grow, only reduces carbon dioxide in the atmosphere if the carbon incorporated into the algae sinks to deeper waters. This process, which scientists call the "Biological Pump", has been thought to be dependent on the abundance of algae in the top layers of the ocean. The more algae in a bloom, the more carbon is transported, or "pumped", from the atmosphere to the deep ocean.

To test this theory, researchers compared the abundance of algae in the surface waters of the world's oceans with the amount of carbon actually sinking to deep water. They found clear seasonal patterns in both algal abundance and carbon sinking rates. However, the relationship between the two was surprising: less carbon was transported to deep water during a summertime bloom than during the rest of the year. This analysis has never been done before and required designing specialized mathematical algorithms.

"By jumping a mathematical hurdle we found a new globally synchronous signal," said Dr. Lutz.

"This discovery is very surprising", said lead author Dr. Michael Lutz, now at the University of Miami's Rosenstiel School of Marine and Atmospheric Science. "If, during natural plankton blooms, less carbon actually sinks to deep water than during the rest of the year, then it suggests that the Biological Pump leaks.

More material is recycled in shallow water and less sinks to depth, which makes sense if you consider how this ecosystem has evolved in a way to minimize loss", said Lutz. "Ocean fertilization schemes, which resemble an artificial summer, may not remove as much carbon dioxide from the atmosphere as has been suggested because they ignore the natural processes revealed by this research."

This study closely follows a September Ocean Iron Fertilization symposium at the Woods Hole Oceanographic Institution (WHOI) attended by leading scientists, international lawyers, policy makers, and concerned representatives from government, business, academia and environmental organizations.

Topics discussed included potential environmental dangers, economic implications, and the uncertain effectiveness of ocean fertilization. To date none of the major ocean fertilization experiments have verified that a significant amount of deep ocean carbon sequestration occurs. Some scientists have suggested that verification may require more massive and more permanent experiments. Together with commercial operators they plan to go ahead with large-scale and more permanent ocean fertilization experiments and note that potential negative environmental consequences must be balanced against the harm expected due to ignoring climate change.

During the Ocean Iron Fertilization meeting Dr. Hauke Kite-Powell, of the Marine Policy Center at WHOI, estimated the possible future value of ocean fertilization at $100 billion of the emerging international carbon trading market, which has the goal of mitigating global warming. However, according to Professor Rosemary Rayfuse, an expert in International Law and the Law of the Sea at the University of New South Wales, Australia, who also attended the Woods Hole meeting, ocean fertilization projects are not currently approved under any carbon credit regulatory scheme and the sale of offsets or credits from ocean fertilization on the unregulated voluntary markets is basically nothing short of fraudulent.

'There are too many scientific uncertainties relating both to the efficacy of ocean fertilization and its possible environmental side effects that need to be resolved before even larger experiments should be considered, let alone the process commercialized,' Rayfuse says. 'All States have an obligation to protect and preserve the marine environment and to ensure that all activities carried out under their jurisdiction and control, including marine scientific research and commercial ocean fertilization activities do not cause pollution.

Ocean fertilization is 'dumping' which is essentially prohibited under the law of the sea. There is no point trying to ameliorate the effects of climate change by destroying the oceans -- the very cradle of life on earth. Simply doing more and bigger of that which has already been demonstrated to be ineffective and potentially more harmful than good is counter-intuitive at best.'

Indeed, the global study of Dr. Lutz and colleagues suggests that greatly enhanced carbon sequestration should not be expected no matter the location or duration of proposed large-scale ocean fertilization experiments.

According to Dr Lutz "The limited duration of previous ocean fertilization experiments may not be why carbon sequestration wasn't found during those artificial blooms. This apparent puzzle could actually reflect how marine ecosystems naturally handle blooms and agrees with our findings. A bloom is like ringing the marine ecosystem dinner bell. The microbial and food web dinner guests appear and consume most of the fresh algal food."

"Our study highlights the need to understand natural ecosystem processes, especially in a world where change is occurring so rapidly," concluded Dr. Lutz.

The findings of Dr. Lutz and colleagues coincide with and affirm this month's decision of the London Convention (the International Maritime Organization body that oversees the dumping of wastes and other matter at sea) to regulate controversial commercial ocean fertilization schemes. This gathering of international maritime parties advised that such schemes are currently not scientifically justified.

Strategies to sequester atmospheric carbon dioxide, including the enhancement of biological sinks through processes such as ocean fertilization, will be considered by international governmental representatives during the thirteenth United Nations Framework Convention on Climate Change conference in Bali next month.

This research was recently published in the Journal of Geophysical Research.

Adapted from materials provided by University of Miami Rosenstiel School of Marine & Atmospheric Science.

http://www.sciencedaily.com/releases/2007/11/071129132753.htm

How Our Ancestors Were Like Gorillas

A young adult male of Paranthropus robustus. (Credit: Photo by Charles Lockwood)

ScienceDaily (Nov. 30, 2007) — New research shows that some of our closest extinct relatives had more in common with gorillas than previously thought. Dr Charles Lockwood, UCL Department of Anthropology and lead author of the study, said: "When we examined fossils from 1.5 to 2 million years ago we found that in one of our close relatives the males continued to grow well into adulthood, just as they do in gorillas. This resulted in a much bigger size difference between males and females than we see today.

"It's common knowledge that boys mature later than girls, but in humans the difference is actually much less marked than in some other primates. Male gorillas continue to grow long after their wisdom teeth have come through, and they don't reach what is referred to as dominant "silverback" status until many years after the females have already started to have offspring. Our research makes us think that, in this fossil species, one older male was probably dominant in a troop of females. This situation was risky for the males and they suffered high rates of predation as a result of both their social structure and pattern of growth."

The research used 35 fossilised specimens of Paranthropus robustus, an extinct relative of Homo sapiens which existed almost two million years ago. The fossils came from the palaeontological sites of Swartkrans, Drimolen and Kromdraii, all of which are in South Africa's Cradle of Humankind World Heritage Site near Johannesburg.

The research was inspired by earlier discoveries at Drimolen by Dr Andre Keyser, one of the co-authors of the study. Dr Colin Menter, from the University of Johannesburg and co-director of current fieldwork at Drimolen, explains: "Discoveries at this site showed us that sex differences in Paranthropus robustus were greater than we had previously thought. While there are some specimens from Drimolen that are just as large and robust as those from other sites like Swartkrans, there is a complete female skull that is distinctly smaller than the other, well-preserved specimens of the species."

Jacopo Moggi-Cecchi, based at the University of Florence and an expert on fossil teeth, participated in the study and says: "It takes large samples of fossils to ask questions about variation and growth, and

it's really a tribute to fieldworkers such as Robert Broom and Bob Brain [who worked at Swartkrans] that this research could even take place. It's also an example of why we need to continue to look for fossils after we think we know what a species is -- more specimens allow us to answer more interesting questions. Even isolated teeth can give us new insights into what variation means."

Dr Lockwood adds: "The pattern of growth also gives a better understanding of who is male and who is female in this sample of skulls and it turns out that there are far more males in the fossil sample. Because fossils from the most prolific site, Swartkrans, are thought to have been deposited by predators such as leopards and hyenas, it appears that males were getting killed more often than females.

"Basically, males had a high-risk, high-return lifestyle in this species. They most likely left their birth groups at about the time they reached maturity, and it was a long time before they were mature enough to attract females and establish a new group. Some of them were killed by predators before they got the chance."

A final point made by the researchers is that not all fossil hominin samples show the same patterns, and it is quite possible that further work will reveal clear diversity in social structure between human ancestors, in the same way that one sees differences among apes such as chimpanzees, bonobos, gorillas, and orangutans. This research will help us to understand how human social structure evolved.

This research was published in the journal Science on November 30, 2007.

Research at Drimolen has been funded by the Leakey Foundation, the Department of Science and Technology in South Africa, the Italian Ministry of Foreign Affairs, and the Italian Cultural Institute in Pretoria. The Royal Society supported Charles Lockwood's work in South Africa.

Fossils are housed at the University of the Witwatersrand in Johannesburg and the Transvaal Museum (Northern Flagship Institution), Pretoria.

Adapted from materials provided by University College London.

http://www.sciencedaily.com/releases/2007/11/071129143817.htm

Autistic Children May Have Abnormal Functioning Of Mirror Neuron System

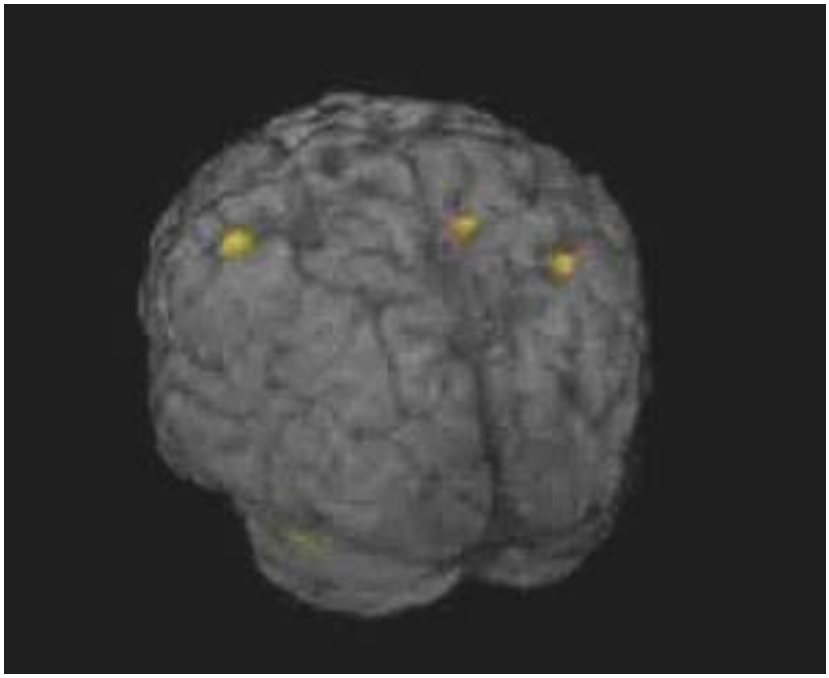


Image of the brain acquired using diffusion tensor imaging (DTI). Clusters of increased gray matter in the right and left parietal cortex are highlighted. (Credit: Image courtesy of Radiological Society of North America)

ScienceDaily (Nov. 29, 2007) — Using a novel imaging technique to study autistic children, researchers have found increased gray matter in the brain areas that govern social processing and learning by observation.

"Our findings suggest that the inability of autistic children to relate to people and life situations in an ordinary way may be the result of an abnormally functioning mirror neuron system," said lead author Manzar Ashtari, Ph.D., from the Children's Hospital of Philadelphia in Pennsylvania.

Mirror neurons are brain cells that are active both when an individual is performing an action and experiencing an emotion or sensation, and when that individual witnesses the same actions, emotions and sensations in others. First observed in the macaque monkey, researchers have found evidence of a similar system in humans that facilitates such functions as learning by seeing as well as doing, along with empathizing and understanding the intentions of others. Dr. Ashtari's study found the autistic children had increased gray matter in brain regions of the parietal lobes implicated in the mirror neuron system.

The study included 13 male patients diagnosed with high-functioning autism or Asperger syndrome and an IQ greater than 70 and 12 healthy control adolescents. Average age of the participants was about 11 years. Each of the patients underwent diffusion tensor imaging (DTI), a technique that tracks the movement of water molecules in the brain.

DTI is traditionally used to study the brain's white matter, as well as the brain fibers. However, Dr. Ashtari's team applied it to the assessment of gray matter by employing apparent diffusion coefficient based morphometry (ABM), a new method that highlights brain regions with potential gray matter volume changes. By adding ABM to DTI, the researchers can detect subtle regional or localized changes in the gray matter.

In addition to the gray matter abnormalities linked to the mirror neuron system, the results of this study revealed that the amount of gray matter in the left parietal area correlated with higher IQs in the control group, but not in the autistic children.

"In the normal brain, larger amounts of gray matter are associated with higher IQs," Dr. Ashtari said. "But in the autistic brain, increased gray matter does not correspond to IQ, because this gray matter is not functioning properly."

The autistic children also evidenced a significant decrease of gray matter in the right amygdala region that correlated with severity of social impairment. Children with lower gray matter volumes in this area of the brain had lower scores on reciprocity and social interaction measures.

"Impairments in these areas are the hallmark of autism spectrum disorders, and this finding may lead to greater understanding of the neurobiological underpinnings of the core features of autism," said study co-author Joel Bregman, M.D., medical director of the Fay J. Lindner Center for Autism.

Autism is the fastest growing developmental disability in the United States and typically appears during the first three years of life. Children with autism are hindered in the areas of social interaction and communication skills. According to the Centers for Disease Control and Prevention, as many as 1.5 million Americans have autism.

Results of the study conducted at the Fay J. Lindner Center for Autism, North Shore-Long Island Jewish Health System in Bethpage, N.Y., were presented November 28 at the annual meeting of the Radiological Society of North America.

Co-authors are S. Nichols, Ph.D., C. McIlree, M.S., L. Spritzer, B.S., A. Adesman, M.D., and B. Ardekani, Ph.D.

This study was supported by The Feinstein Institute for Medical Research, North Shore-Long Island Jewish Health System and the National Center for Research Resources/National Institutes of Health.

Adapted from materials provided by Radiological Society of North America.

http://www.sciencedaily.com/releases/2007/11/071128101315.htm

Massive Canadian Oilfield Could Be Exploited Using New System

Oilsands mining equipment and conveyor. (Credit: iStockphoto/Jason Verschoor)

ScienceDaily (Nov. 29, 2007) — A new method developed in Britain over the past 17 years for extracting oil is now at the forefront of plans to exploit a massive heavy oilfield in Canada.

Duvernay Petroleum is to use the revolutionary Toe-to-Heel Air Injection (THAI™) system developed at the University of Bath at its site at Peace River in Alberta, Canada.

Unlike conventional light oil, heavy oil is very viscous, like syrup, or even solid in its natural state underground, making it very difficult to extract. But heavy oil reserves that could keep the planet's oil-dependent economy going for a hundred years lie beneath the surface in many countries, especially in Canada.

Although heavy oil extraction has steadily increased over the last ten years, the processes used are very energy intensive, especially of natural gas and water. But the THAI™ system is more efficient, and this, and the increasing cost of conventional light oil, could lead to the widespread exploitation of heavy oil.

"The world needs to switch to cleaner ways of using energy such as fuel cells," said Professor Malcolm Greaves, who developed the THAI™ process.

"But we are decades away from creating a full-blown hydrogen economy, and until then we need oil and gas to run our economies.

"Conventional light oil such as that in the North Sea or Saudi Arabia is running out and getting more expensive to extract.

"That's why the pressure is on to find an efficient way of extracting heavy oil."

THAI™ uses a system where air is injected into the oil deposit down a vertical well and is ignited. The heat generated in the reservoir reduces the viscosity of the heavy oil, allowing it to drain into a second, horizontal well from where it rises to the surface.

THAI™ is very efficient, recovering about 70 to 80 per cent of the oil, compared to only 10 to 40 per cent using other technologies.

Duvernay Petroleum's heavy oil field in Peace River contains 100 million barrels and this will be a first test of THAI™ on heavy oil, for which THAI™ was originally developed. Duvernay Petroleum has signed a contract with the Canadian firm Petrobank, which owns THAI™, to use the process.

The THAI™ process was first used by Petrobank at its Christina Lake site in the Athabasca Oil Sands, Canada, in June 2006 in a pilot operation which is currently producing 3,000 barrels of oil a day. This was on deposits of bitumen - similar to the surface coating of roads - rather than heavy oil.

Petrobank is applying for permission to expand this to 10,000 barrels a day though there is a potential for this to rise to 100,000.

The 50,000 acre site owned by Petrobank contains an estimated 2.6 billion barrels of bitumen. The Athabasca Oil Sands region is the single largest petroleum deposit on earth, bigger than that of Saudi Arabia.

Professor Greaves, of the University's Department of Chemical Engineering, said: "When the Canadian engineers at the Christina Lake site turned on the new system, in three separate sections, it worked amazingly well and oil is being produced at twice the amount that they thought could be extracted.

"It's been quite a struggle to get the invention from an idea to a prototype and into use, over the last 17 years. For most of the time people weren't very interested because heavy oil was so much more difficult and expensive to produce than conventional light oil.

"But with light oil now hitting around 100 dollars a barrel, it's economic to think of using heavy oil, especially since THAI™ can produce oil for less than 10 dollars a barrel.

"We've seen this project go from something that many people said would not work into something we can have confidence in, all in the space of the last 18 months."

Professor Greaves, who was previously Assistant Professor at the University of Saskatchewan in Canada, and who also worked with Shell and ICI in the UK, is looking at making THAI™ even more efficient using a catalyst add-on process called CAPRI™.

This process was also developed by Professor Greaves' team at Bath and is intended to turn heavy oil into light while still in the reservoir underground. The CAPRI™ research has recently been awarded funding of £800,000 from Engineering and Physical Sciences Research Council, including £60,000 from Petrobank. The project collaborators are Dr Sean Rigby, from the Department of Chemical Engineering at Bath, and Dr Joe Wood of the University of Birmingham.

Adapted from materials provided by University of Bath.

http://www.sciencedaily.com/releases/2007/11/071128113030.htm

Biodiesel Could Reduce Greenhouse Gas Emissions

Biodiesel has the potential to reduce greenhouse gas emissions from the transport sector. (Credit: CSIRO)

ScienceDaily (Nov. 30, 2007) — A CSIRO report released November 27 confirms that using pure biodiesel or blending biodiesel with standard fuel could reduce greenhouse gas emissions from the transport sector.

Biodiesel can be manufactured from any product containing fatty acids, such as vegetable oil or animal fats.

The report, "The greenhouse and air quality emissions of biodiesel blends in Australia" assesses the emission levels and environmental impacts of biodiesel produced from sources including used cooking oil, tallow (rendered animal fat), imported palm oil and canola.

CSIRO Energy Transformed National Research Flagship researcher and report author Dr Tom Beer believes the wider introduction of biodiesel in Australia could help address the high greenhouse gas intensity of our nation's transport sector.

"The results of this study show biodiesel has the potential to reduce emissions from the transport industry, which is the third largest producer of greenhouse gases in Australia, behind stationary energy generation and agriculture," Dr Beer said.

"The greenhouse gas savings do however depend on the feedstock used to produce the biodiesel. The highest savings are obtained by replacing base diesel with biodiesel from used cooking oil, resulting in an 87 per cent emission reduction."

"The results of this study show biodiesel has the potential to reduce emissions from the transport industry, which is the third largest producer of greenhouse gases in Australia, behind stationary energy generation and agriculture," Dr Beer said.

"Palm oil can produce up to an 80 per cent saving in emissions provided it is sourced from pre-1990 plantations. The palm oil source is critical as product from plantations established on recently dried peat swamps or cleared tropical forest will in fact have higher greenhouse gas emissions than regular diesel due to factors such as land clearing."

The use of biodiesel also reduces the particulate matter released into the atmosphere as a result of burning fuels, providing potential benefits to human health.

While the results are encouraging, further research is required to establish the viability of the biofuels industry in Australia and address some of the associated issues such as sustainability, technological improvements and economic feasibility.

CSIRO, as part of the Energy Transformed National Research Flagship, is undertaking an extensive research program into alternative fuels such as biodiesel to assess possible biophysical, social and economic impacts of their production and adoption.

National Research Flagships

CSIRO initiated the National Research Flagships to provide science-based solutions in response to Australia's major research challenges and opportunities. The nine Flagships form multidisciplinary teams with industry and the research community to deliver impact and benefits for Australia.

The greenhouse and air quality emissions of biodiesel blends in Australia report can be downloaded at http://www.csiro.au/resources/pf13o.html.

Adapted from materials provided by CSIRO Australia.

http://www.sciencedaily.com/releases/2007/11/071127101930.htm

Separating The Therapeutic Benefits Of Cannabis From Its Mood-altering Side-effects

Cannabis contains a chemical called THC, which binds to, and activates, proteins in the brain known as 'CB1 cannabinoid receptors'. Activating these receptors can relieve pain and prevent epileptic seizures; but it also causes the mood-altering effect experienced by people who use cannabis as a recreational drug. (Credit: iStockphoto/Dmitriy Norov)

ScienceDaily (Nov. 30, 2007) — Scientists from Queen Mary, University of London, have discovered a new way to separate the therapeutic benefits of cannabis from its mood-altering side-effects.Cannabis contains a chemical called THC, which binds to, and activates, proteins in the brain known as 'CB1 cannabinoid receptors'. Activating these receptors can relieve pain and prevent epileptic seizures; but it also causes the mood-altering effect experienced by people who use cannabis as a recreational drug.

Now, Professor Maurice Elphick and Dr Michaela Egertová from Queen Mary's School of Biological and Chemical Sciences may have found a way of separating out the effects of cannabis – a discovery which could lead to the development of new medicines to treat conditions such as epilepsy, obesity and chronic pain. The research is described in the December issue of the journal Molecular Pharmacology. Working in collaboration with scientists based in the USA*, they have identified a protein that binds to the CB1 receptors in the brain. But unlike THC, this 'Cannabinoid Receptor Interacting Protein' or CRIP1a, suppresses the activity of CB1 receptors.Professor Elphick explains: "Because CRIP1a inhibits the activity of the brain's cannabinoid receptors, it may be possible to develop drugs that block this interaction, and in turn enhance CB1 activity. This may give patients the pain relief associated with CB1 activity, without the 'high' that cannabis users experience."

Leslie Iversen FRS, Professor of Pharmacology at the University of Oxford and author of The Science of Marijuana, commented on the new findings: "This interesting discovery provides a completely new insight into the regulation of the cannabinoid system in the brain - and could offer a new approach to the discovery of cannabis-based medicines in the future.""CB1 Cannabinoid Receptor Activity Is Modulated by the Cannabinoid Receptor Interacting Protein CRIP1a" is published online in the December issue of Molecular Pharmacology.The Elphick laboratory in the School of Biological & Chemical Sciences at Queen Mary is supported by grants from UK research councils (BBSRC, MRC) and the Wellcome Trust.

Adapted from materials provided by Queen Mary, University of London.

http://www.sciencedaily.com/releases/2007/11/071129151109.htm

Evidence Of Mature Heart Cell Potential Found In Embryonic Stem Cells

ScienceDaily (Nov. 30, 2007) — In a new study, UC Davis researchers report the first functional evidence that heart cells derived from human embryonic stem cells exhibit one of the most critical properties of mature adult heart cells, an important biological process called excitation-contraction coupling.

The finding gives scientists hope that these cells can one day be coaxed into becoming functionally viable cells safe for transplantation into the damaged hearts of patients with end-stage disease, potentially avoiding the necessity of a heart transplant. Currently, there are nearly 3,000 people on heart transplant lists around the nation, including more than 300 in California.

UC Davis research scientist Ronald Li and his colleagues write in their study, "Functional Sarcoplasmic Reticulum for Calcium-Handling of Human Embryonic Stem Cell-Derived Cardiomyocytes: Insights for Driven Maturation," that they observed cells that had begun the maturation process toward becoming heart cells.

"Previous experiments were able to derive heart cells from human embryonic stem cells," said Li, who is an associate professor of cell biology and human anatomy at UC Davis School of Medicine and senior author of the study, "but those cells always remained too immature to be of any therapeutic use and actually could cause lethal arrhythmias in animal models. Now, what we've been able to do is push the therapeutic potential of human embryonic stem cells further so that eventually they might be used safely, and with enhanced efficacy, in transplantation cases."

The main function of the heart is to mechanically pump blood in a highly coordinated fashion throughout the body. To do this, heart cells must receive electrical signals and contract in response to those signals. This link, called the excitation-contraction coupling, is dependent on the cells' ability to move calcium ions across an internal organelle known as sarcoplasmic reticulum, or the so-called "calcium store." The ability to handle calcium is disrupted in the cells of patients who experience heart failure. For future stem-cell based therapies to work, scientists will need to have heart cells that exhibit mature excitation-contraction coupling.

Until now, researchers studying heart cells (also called cardiomyocytes) derived from human embryonic stem cells have been unable to find evidence of functional calcium stores. Li found protein functions that are involved in the early stages of this coupling process. He and his colleagues now plan to move on and engineer the calcium-handling properties in order to enhance contractile properties in cardiomyocytes for both improved safety and functional efficacy.

In the current study, Li and his colleagues took human embryonic stem cells and grew them in cultures, allowing them to differentiate, or develop, into heart cells. Once they had these tiny, pulsing masses, the investigators energized the cells with small amounts of electrical current and chemicals, including caffeine. They then measured how the amount of intracellular calcium changed and looked for the presence of proteins and cellular structures known to be involved in excitation-contraction coupling.

Li and his colleagues are the first to find evidence of the functional calcium stores for excitation-contraction coupling, They also found four of the seven key proteins that play key roles in handling calcium in the cell, as well as functional sarcoplasmic reticulum.

The UC Davis researchers used different cell lines than those utilized in previous studies, which they say may explain why they were able to achieve a breakthrough in their investigation where others had not.

The UC Davis group also looked at a smaller number of cells during various stages of development, enabling them to more accurately dissect the different population subsets. The authors said that

differences in cell culture and experimental conditions could also account for the results not seen in previous efforts.

According to Li, the fact that different cell lines exhibit different potentials for differentiation and maturation underscores the need to develop new and additional stem cell lines in order to advance critical research into potential therapies for patients.

"This is a good example of the type of exciting, bench-to-bedside research now under way at UC Davis and the potential it has for new treatments," said Jan Nolta, director of the UC Davis Stem Cell Program in Sacramento "As additional embryonic stem cell lines become available for research, we'll be able to more fully explore the possibilities inherent in this powerful field of bioscience."

Li's study is a first step toward deriving cardiomyocytes with fully functional contractile properties from human embryonic stem cells. With heart transplants being the current treatment of last resort due to severe shortages of donor organs and the complexity of transplantation, the long term goal of researchers like Li is to come up with alternatives that are both safe and effective.

"Our latest study gives us great hope of eventually achieving a breakthrough where stem cell therapy could be used in the types of cases that today require a heart transplant," concluded Li.

The article, available online in Stem Cell Express, will be published in the December issue of the journal Stem Cells.

Along with Li, co-authors of the paper are Jing Liu, Jidong Fu and David Siu all from UC Davis School of Medicine. The research was funded by the National Institutes of Health, California Institute of Regenerative Medicine, the Croucher Foundation and UC Davis School of Medicine.

Adapted from materials provided by University of California - Davis - Health System.

http://www.sciencedaily.com/releases/2007/11/071127123931.htm

Breeding Heat Tolerant Beans To Withstand Warmer World

Geneticist Tim Porch examines the effects of high-temperature stress on pod development in the common bean. (Credit: Photo by Peggy Greb)

ScienceDaily (Nov. 30, 2007) — Dry common beans—favorites like pinto, kidney, navy, red, black and snap—are grown mostly in the north-central and western regions of the United States. But thousands of miles away, Agricultural Research Service (ARS) geneticist Timothy Porch is working to make good beans even better. Porch conducts research at the Tropical Agriculture Research Station in Mayagüez, Puerto Rico. He is looking for ways to reduce heat stress in common beans (Phaseolus vulgaris) grown in the continental United States by breeding heat-tolerant varieties.

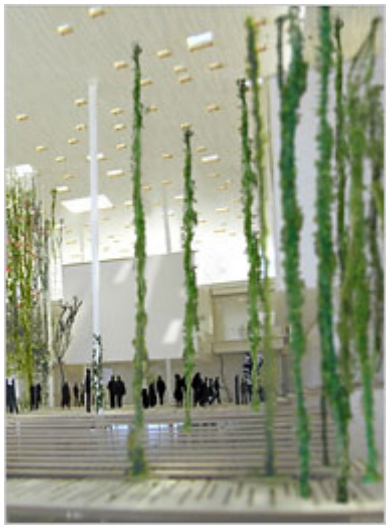
Most common beans are adapted to relatively cool climates. But in the United States, common beans are cultivated at average temperatures that can exceed 86 degrees Fahrenheit during the day. These hot summers can hinder the reproductive development of bean crops, which in turn results in smaller potential yields. However, tropical varieties of Phaseolus contain a much greater range of genetic diversity than the types commercially cultivated in the United States, and may carry traits that protect against heat stress. Porch is trying to bolster U.S. beans with high-temperature adaptations and other producer-friendly traits, such as drought tolerance and disease resistance.

In his search to find novel genetic traits, Porch has worked with two major germplasm centers: the International Center for Tropical Agriculture, in Cali, Colombia; and the ARS Western Regional Plant Introduction Station at Pullman, Wash. Porch's research will support plant breeders' efforts to develop new bean varieties to meet market demands, increase yields and lower consumer costs. Producers will also be better positioned to respond to possible challenges in the future from emerging diseases and climate change.

Adapted from materials provided by US Department of Agriculture.

http://www.sciencedaily.com/releases/2007/11/071126152058.htm

Miami Art Museum to Unveil Design for New Building
By ROBIN POGREBIN



Although revisions are usually inevitable, museums planning a new building typically present the design as a done deal, with every detail resolved and the architects ready to break ground.

But the Miami Art Museum decided to do it differently. In unveiling a design today by the Swiss architects Jacques Herzog and Pierre de Meuron, the museum plans to portray the concept as an interim stage in the development of its $220 million project overlooking Biscayne Bay.

That is not to say the museum is moving slowly; it is on track to start construction in December 2008 and to be finished by 2011.

The architects and Terence Riley, the museum's director, say they want to include the public in the project, which will almost quadruple the museum's size to 120,000 square feet. To underscore this point, the museum will put the design on view tomorrow at its current site nearby, in an exhibition titled "Work in Progress: Herzog & de Meuron's Miami Art Museum," which will also include about 20 models showing how the design has evolved.

The current design calls for a three-story building atop an elevated platform and below a canopy that extends well beyond the gallery walls, creating a shaded veranda and plazas. The canopy is anchored by columns and trees that bring in the tropical surroundings of Bicentennial Park (to be renamed Museum Park).

"Miami's a great place with a very unique climate, unique vegetation," Mr. Herzog said in a telephone interview. "We think architecture hasn't exploited that."

The project is a particularly public endeavor; the museum is working with the city and Miami-Dade County, raising $100 million of the financing through a 2004 bond issue. The museum must raise the remaining $120 million.

"The voters of Miami-Dade voted for this museum," Mr. Riley said. "They would like a museum; they would like to have more culture in their lives."

While the museum is formally soliciting public feedback, Mr. Riley said he nonetheless expected Miami residents to express their views through newspaper editorials, letters to the editor and the like. He said the

exhibition would illuminate the design process “from conception to schematic design, how Herzog and de Meuron got to where they are in terms of thinking through this whole project.”

“It’s less dramatic but more educational,” he added. “It also gives the community a chance to begin to form opinions and to express those opinions.” Mr. Riley said the approach was in keeping with the one he used at the Museum of Modern Art, where he was chief curator of architecture and design from 1992 until last year. There he helped oversee the Modern building’s expansion, designed by the Japanese architect Yoshio Taniguchi and completed in 2004. Instead of just announcing one design, the Museom of Modern Art made various versions public.

“A lot of museum directors are terrified about this,” Mr. Riley said of the open discussion. “Because they don’t understand the process, they try to keep everything secret.” Mr. Riley said he hoped the public would find it instructive to look back at models that he and the architects had considered a year ago.

“It makes you realize that nothing is a fait accompli,” Mr. Riley said. “Nothing arrives out of the head of the architect like Athena out of Zeus’ head. Architecture doesn’t just come out that way.”

Mr. Herzog said he welcomed that approach, particularly because the Miami Art Museum, founded in 1996 as a successor to that city’s Center for the Fine Arts, is still forming its collection and its identity.

“Not having a strong collection, it needs to have a different approach and make the public participate in what the MAM can be,” he said. “It can’t be a white cube in a defined form. It has to have the possibility to grow.” The architects therefore set out to design a flexible space that can adjust as the collection expands. Mr. Riley said he hoped to increase the collection’s size by 50 percent each year.

Herzog & de Meuron is also planning what it calls anchor galleries, rooms that hold one piece of art and are designed with that piece in mind, as focal points for repeat visits.

When the museum’s current building, the Miami-Dade Cultural Center, was built in 1984 on Flagler Street in downtown Miami with a design by Philip Johnson, part of its purpose was to rejuvenate the area. “It was very much informed by this need to make a difference downtown sociologically,” Mr. Riley said.

As a result, the building was built with the entrance on its second-story plaza level, with protection from the hurly-burly of the street in mind. The ground level is made of solid stone with no windows.

“It’s never been a great building,” Mr. Riley said. “It was Philip’s postmodern moment. It looks like a Spanish castle. It’s always been difficult to get the building to open up, to get people to find it, to make it welcoming.” He continued, “The big dream is to be everything this building isn’t: open, welcoming, transparent.”

Mr. Riley said the design team was working with horticulturalists to “bring the park into the building,” while taking into account possible damage or wear from hurricanes, saltwater and wind. The building will also have environmental qualities, like columns that pump groundwater into the canopy for cooling.

Rather than attempt to build a comprehensive art collection — with one of everything — the museum plans to focus on various artists, with in-depth exhibitions of their work. “We know our linear story is not as compelling as MoMA’s or the Tate’s,” Mr. Riley said.

Mr. Herzog said: “Miami is not really great as an institution, as a collection. It’s a very kind of young thing and can, with this building, redefine its whole existence.”

http://www.nytimes.com/2007/11/30/arts/design/30herz.html?_r=1&ref=arts&oref=slogin

The 10 Best Books of 2007

Fiction

MAN GONE DOWN
By Michael Thomas. Black Cat/Grove/Atlantic, paper, $14. This first novel explores the fragmented personal histories behind four desperate days in a black writer's life.

OUT STEALING HORSES
By Per Petterson. Translated by Anne Born. Graywolf Press, $22. In this short yet spacious Norwegian novel, an Oslo professional hopes to cure his loneliness with a plunge into solitude.

THE SAVAGE DETECTIVES
By Roberto Bolaño. Translated by Natasha Wimmer. Farrar, Straus & Giroux, $27. A craftily autobiographical novel about a band of literary guerrillas.

THEN WE CAME TO THE END
By Joshua Ferris. Little, Brown & Company, $23.99. Layoff notices fly in Ferris's acidly funny first novel, set in a white-collar office in the wake of the dot-com debacle.

TREE OF SMOKE
By Denis Johnson. Farrar, Straus & Giroux, $27. The author of "Jesus' Son" offers a soulful novel about the travails of a large cast of characters during the Vietnam War.

Nonfiction

IMPERIAL LIFE IN THE EMERALD CITY: Inside Iraq's Green Zone.
By Rajiv Chandrasekaran. Alfred A. Knopf, $25.95; Vintage, paper, $14.95. The author, a Washington Post journalist, catalogs the arrogance and ineptitude that marked America's governance of Iraq.

LITTLE HEATHENS: Hard Times and High Spirits on an Iowa Farm During the Great Depression.
By Mildred Armstrong Kalish. Bantam Books, $22. Kalish's soaring love for her childhood memories saturates this memoir, which coaxes the reader into joy, wonder and even envy.

THE NINE: Inside the Secret World of the Supreme Court.
By Jeffrey Toobin. Doubleday, $27.95. An erudite outsider's account of the cloistered court's inner workings.

THE ORDEAL OF ELIZABETH MARSH: A Woman in World History.
By Linda Colley. Pantheon Books, $27.50. Colley tracks the "compulsively itinerant" Marsh across the 18th century and several continents.

THE REST IS NOISE: Listening to the Twentieth Century.
By Alex Ross. Farrar, Straus & Giroux, $30. In his own feat of orchestration, The New Yorker's music critic presents a history of the last century as refracted through its classical music.

http://www.nytimes.com/2007/12/09/books/review/10-best-2007.html?em&ex=1196571600&en=7373361a9601493b&ei=5087%0A

Appetite for destruction

Robin Stummer

Published 29 November 2007

Moscow's extraordinary architectural heritage is being wiped out in the ruthless pursuit of a new Russia

Thud. Bannng. Cra-aack. Clang. Whoosh. Cra-aash. There is no escaping the noises of new Moscow. The 860-year-old mother city of Mother Russia is treating its old streets, alleys, boulevards and squares to a facelift. And as this is the espresso-fuelled heart of a confident nation awash with brash cash, where macho has supplanted Marx as the officially sanctioned creed, and where even the TV news is bookended by adverts for breast enlargement, that new face comes courtesy of the bulldozer, piledriver, wrecker's ball and rubble truck. Early 21st-century Mos cow is a city of brick dust and gold.

And it is not just the face of the city that is being overhauled so ruthlessly; the historic built environment, the bricks and mortar, the stuff and soul of the place, are being eradicated. Demolition, unrestricted development, deliberate neglect, pastiche "restoration", facsimiles, fires "accidental" or otherwise and brand-new car parks are finishing the work that Stalin left undone. Moscow isn't having a makeover; it is being murdered.

During the Cold War, the city pulled off a neat double trick of concealing its wealth of architectural gems, which span the period between the 16th and 20th centuries, not only from the west, but from Soviet planners, too. From the time of Stalin's grotesque final fling with urban megalomania in the late 1940s and early 1950s, when swaths of the old houses, churches, mansions and shops were cleared for vast highways and Gothic skyscrapers, until Boris Yeltsin came to power, much of Moscow was in stasis.

Thus, dozens of modernist offices, blocks of flats, workers' clubs, union buildings, garages, workshops and factories survived. Many of them were breathtaking, designed by avant-garde architects and artists in the heady, agitprop years of the early Soviet Union. Often utterly new in material and construction, these buildings - jutting, strutting and sweeping amid their staid, bourgeois neighbours - were studied by architects the world over.

In the 1920s, Moscow was a hotbed of new ideas. Bauhaus innovators came from Germany to learn; Le Corbusier designed for Moscow; the Italian futurists gawped to see their manic *manifesti* for a new world order brought to life in concrete, steel and iron, amazed that this had happened in "backward" Russia. Even burgeoning Chicago and New York began to seem outmoded.

Among these post-revolution buildings could be found fine survivals of earlier styles: Palladian, late Renaissance, imperial 19th-century, art nouveau. Even Stalin had a last laugh of sorts. He favoured vast, "patriotic" neoclassical designs over the internationalism of the modernists, so Moscow sprouted the grim, giant slabs of stone and marble that we associate with the Cold War. Yet the years of Stalin and Nikita Khrushchev also left some elegant, popular buildings. Wit and whimsy crept in. These, and their ugly counterparts, are now prized along with older work and included in inventories compiled by historians. But what use are lists without law, and what use law without enforcement?

As much as a third of Moscow's historic architecture has been destroyed in the past few years. Hundreds of buildings have been cleared, by hook or by crook, to make way for glitzy shopping arcades, luxury flats, car parks. More than 400 of the city's listed buildings have gone since 1989. What is left is fast decaying. This loss is on a par with the destruction of historic architecture during the whole of the Stalin era. Struggling to publicise and protect what survives of Moscow's built heritage is a loose alliance of academics, architects and the Moscow Architecture Preservation Society (Maps), a Russian organisation with an international membership.

"Moscow is run as a monopoly - as if it was a private company," says David Sarkisyan, director of the Shchusev State Museum of Architecture, who is one of the most prominent voices championing endangered buildings. "The Kremlin has lost its interest in architecture, but from the time of Vasili III in the early 16th century until Brezhnev, it had been a great focus for Russian rulers. Now, everything is decided by local mayors and officials . . . There is no equivalent of English Heritage or the National Trust in Russia."

Yuri Luzhkov, Moscow's mayor since 1992, has been likened by some to a blend of Bob Hoskins and James Cagney. He has thrived in the curious post-Soviet climate. A bizarre bronze statue of him by the city's quasi-official sculptor, Zurab Tsereteli, shows a determined Luzhkov, broom in hand, "sweeping the streets clean of the past" (no irony intended). This year the mayor baited Gay Pride marchers who had the nerve to gather near his office in May; and, it is said, he equally relished sending Britain's very own Lord Foster back to the drawing board to rethink plans for the redevelopment of a city-centre site. "But this is not Moscow, Norman!" he allegedly said of the esteemed peer's plans, no doubt with a sly grin and a pat on the back.

Leading the roll-call of fine Moscow buildings in deep trouble is the striking Narkomfin apartment block, behind the US embassy on Novinsky Boulevard. Built in 1928-30 for employees of the Soviet National Commissariat for Finances, it is a patchwork of rust and exposed brickwork. Amazingly, the structure, which influenced Le Corbusier, is still half occupied.

Then there is the glittering, mirrored fantasy of the huge Detsky Mir ("Children's World") department store, built in the mid-1950s on one corner of what was then called Dzerzhinsky Square, facing the feared former Lubyanka Prison ("Adults' World", goes one weary Muscovite joke) and the KGB headquarters. Detsky Mir is now targeted for substantial redevelopment and "remodelling", the latest in a long line of threats to its integrity dating back to the early 1990s. The Lubyanka, on the other hand, is now home to both the headquarters of the Russian border troops and a branch of the FSB state security service (whose own modern headquarters are just around the corner). Neither of these buildings is expected to burn down, at least in the Moscow manner, though the Lubyanka did catch fire in 1999. Faulty wiring was blamed for that blaze.

"We try not to fight the city government," says Sarkisyan. "We try to educate them. You see, not too many people in Moscow are campaigning against this destruction. Currently, we hate politics in Russia, so no one is going to take to the streets." He has, however, tried a little streetwise agitprop of his own with a public display of three large coffins. "In 2003, here in the centre of Moscow, we lost three major buildings," he explains. "The beautiful art nouveau Voentorg [military trading] department store was pulled down. Then the early 19th-century Manezh exhibition hall next to Red Square, an engineering miracle, caught fire. It was restored, but really incorrectly. Then the Moskva Hotel, the best in the country, was demolished." Condemned because of alleged structural faults, the world-famous Moskva, which dated from 1935 and is immortalised on the label of Stolichnaya vodka bottles,

is being rebuilt - in facsimile. "No civilised country would have done this. They recreate things and call it restoration," says Sarkisyan.

The plight of Russia's surviving old buildings is becoming a matter of international concern. "There has been a change in attitude to these buildings in the past year," says the British writer Clementine Cecil, co-founder of Maps. A resident of Moscow since the mid-1990s, she took on a cause that most thought hopeless. "We ran a conference, Heritage at Risk, last year. After that, heritage groups had a long meeting with Luzhkov. The very fact that he talked for a long time was of great significance."

True independence for the city's heritage department is the key to progress, says Cecil. But is the thaw happening too late, and what do ordinary Muscovites care about heritage architecture anyway? The answer lies a few Metro stops north of Red Square. The enormous VDNKh exhibition area was established in the late 1930s as a showground for industry, science and technology. Formerly the Park of National Economic Achievements but now known, more realistically, as the All-Russia Exhibition Centre, this is one of the last places in Moscow where the ghosts of the great Soviet experiment come to life.

It's a glorious place, half an hour to walk across, peppered with woods, lakes, flower beds and dozens of pavilions, some small, others palatial, built to show off the best of the Soviet Union. On a sunny weekend, the VDNKh is packed with picnicking families, rollerbladers and courting couples. Children play in the fountains. People love it, even now, and marvel at the architecture. Here you can still find the great gold-leaf-and-marble showcases, though they now house market stalls rather than locomotive engines and combine harvesters. There is even a Soviet space rocket, and a pair of 1960s Tupolev passenger jets. Huge murals portray the triumph of the Red Army. Archetypes of Soviet industrial man and woman gaze skywards, clutching spanners and breadbaskets. Russia's brave hunters even have their own pavilion.

Blink, and you're back in the heroic heyday of the Soviet Union, the one on the cover of old Intourist brochures, the one the People adored. But take a longer look and you'll start to notice that, as with much of Moscow's built past, many of the buildings and statues at the VDNKh are fast crumbling away. And don't bother to seek out the hunters' pavilion; like so many of the city's beautiful historic buildings, it has burned down. Nice spot for a gated luxury apartment complex or two, though.

Robin Stummer is editor of Cornerstone architecture magazine

http://www.newstatesman.com/200711290031

YouTube's challenge

By DAN BROWN, ONLINE EDITOR

With all the jibber-jabber you hear about YouTube these days, you might think the popular video-sharing site has changed the world.

Sure, it's a great way to waste a few minutes at work when you need a break from your boss.

But YouTube won't really change the world until it produces an icon.

Unless the site spawns a globally recognized character that endures for decades, it will forever remain a first cousin of America's Funniest Home Videos.

Granted, YouTube is great at borrowing characters created by others.

Look at Chad Vader. He's the star of a series of YouTube videos that re-imagines Darth Vader — the Lord of the Sith made famous in the Star Wars sixology — as the day-shift manager of a Wisconsin grocery store.

On its own, the first episode of the series has generated more than 5.6 million views since being posted on the site a year and a half ago.

You can't argue with those numbers. But the band of renegade filmmakers that makes the Chad Vader short films didn't conjure their main character out of thin air.

With the blessing of George Lucas (as odd as that sounds), they took an existing icon and put him in unlikely situations.

In fact, that's why Chad Vader is so funny — imagine a villainous Jedi ordering stock clerks to do his bidding or cleaning up the mess in the frozen-food aisle. The premise on its own is hilarious. It's one of them juxtapositions.

But will a character from YouTube achieve the iconic status of Darth Vader?

Vader first appeared in 1977. He is now known around the world as a synonymn for evil, as evidenced by the way critics of the Bush administration allude to U.S. Vice President Dick Cheney's Vader-like qualities.

There's no question the former Anakin Skywalker has earned a prominent place in the popular imagination.

The test of YouTube's cultural relevance and staying power will be if one of the many people who post videos to the website can do what Lucas has achieved with his evil cyborg.

YouTube has conferred temporary stardom on a handful of individuals, like Tay Zonday (the Chocolate Rain dude) and Britney Spears defender Chris Crocker. What needs to happen is for one such person to transcend YouTube, to become a property or brand in the same sense as Vader.

Will some corporation take a character from YouTube and make him or her the star of a movie or TV series or video game? Will that character be a household name 30 years from now?

This hasn't happened yet. It's not clear if it ever will happen. There was talk Crocker had been offered his own television show, but the rumours disappeared as soon as his tear-soaked 15 minutes of fame expired.

America's Funniest Home Videos, itself the descendant of Candid Camera, itself the descendant of Candid Mircophone, never did produce a character that became famous all over the world.

The AFV *brand* has endured, but none of the stars of its videos amounted to more than a momentary distraction.

Time will tell if YouTube can go one better.

http://lfpress.ca/newsstand/Today/Columnists/Brown_Dan/2007/11/29/4694943.html

Everybody needs writers

Without expert wordsmiths, our whole culture would be put in jeopardy

John Freeman

Nothing goes off without a good script ... Josh Brolinas in the Coen brothers' film version of No Country for Old Men

Cormac McCarthy's No Country for Old Men must have been a tricky tale to adapt for the screen: a man finds $2m in the desert and then hides like hell from men who really want it back. Archetypal western cinema - until you realise McCarthy's bounty-hunter sounds like a Beckett monologist and carries an air gun used to butcher cattle. There are also goons with Uzis, a few car chases and enough shoot-outs to keep the National Rifle Association happy for a decade.

It could have become kitsch, but the Coen brothers got it right in their recent adaptation, which will be coming to England in January: McCarthy's blood-splattered nihilism, the Biblical canter of his story-telling, even his characters' alligator-booted irony. See it and you may never go to Texas again. If you were ever going in the first place.

Quite a lot of this power has to do with the script that the Coen brothers boiled down from McCarthy's already lean prose. It tells the camera what to do, the characters what to say, and makes a ridiculous situation frighteningly believable, and tense. This ought to be on studio heads' minds as they go to the bargaining table for the fourth week of the Writers Guild of America's strike.

Sure, the old saw is writers don't have the power in Hollywood - and they don't - but where would the pictures be without them? Now we know. More than two dozen shows have had to stop production in the US, from 24 to The Office, since the strike began on November 5 over writers' demands for a higher proportion of DVD revenue, among other things. All of our night-time talk shows have ceased. If it continues into next month the strike is going to cost the Los Angeles economy $21m a day. That's a lot of lattes.

Some of this is down to contract dispute, and some has to do with new media, but a lot of it seems to be part of an increasing desire of our entertainment industry to deny its writerly roots. We listen to songs on the radio, but without songwriters they'd be pretty boring; we watch news on the television, but without writers it grinds to a standstill. No matter how many ways the world of the image tries to supersede the word, words and language continually reassert their primacy. One of the most obvious examples of this is in American print publications: as newspapers hollow out their coverage of just about everything, magazines like The New Yorker and The Nation have picked up more and more subscribers because they honour good writing.

There was a time when this was the case in publishing. In November 1934, after years of hacking away at the manuscript of Of Time and the River, the novel which would elevate Thomas Wolfe to the front rank of American writers, Maxwell Perkins wrote to Wolfe about a part of the book which still troubled him:

the dedication page. "Nothing would give me greater pleasure or greater pride as an editor," quotes A Scott Berg in his biography of Perkins, "than the book of the writer whom I have most greatly admired should be dedicated to me if it were sincerely done. But you cannot, and should not try to change your conviction that I have deformed your book, or at least prevented it from coming to perfection ... the plain truth is that working on your writing, however it has turned out, for good or bad, has been the greatest pleasure, for all its pain, and the most interesting episode of my editorial life. The way in which we are presenting this book must prove our (and my) belief in it. But what I have done has destroyed your belief in it and you must not act inconsistently with that fact."

Wolfe went ahead and dedicated the book to Perkins anyway, and the modest editor of Ernest Hemingway, F Scott Fitzgerald, and James Jones, among others, soon acquired a reputation of "making" writers. It took 10 years to go to his head. In the interim, he edited and guided a staggering list of books into print - from Hemingway's To Have and To Have Not to short stories by Fitzgerald - working himself into a nervous state trying to make their books better. "At lunch in morning meetings [Charles Scribner] could not keep his eyes off Perkins's trembling hands," Berg wrote. "He needs a rest badly, but refuses to take a vacation."

Now another New York editor of famous greats, Gordon Lish, is back in the news as Raymond Carver's widow, Tess Gallagher, has announced plans to publish the un-Lished version of Carver's early stories. I understand the instinct behind this move - especially if the stories of Carver's protestations are true. I also understand why Lish wants credit: from what I've seen of the stories, he did make some of them a lot better. But the truth is: we all know no matter whether it's been Lished or not, the genius in those stories (and their flaws) comes from Carver. Now, if the Coen brothers could just get their hands on some of his work, we'd be in business.

http://blogs.guardian.co.uk/books/2007/11/everybody_needs_writers.html

'Nature's banks' pays dividends
Marine reserves, co-managed by local communities, can help alleviate the impact of poverty, a study suggests.

Research into four successful schemes showed that getting villagers involved in protection projects reduced harmful overfishing and protected incomes.

Average incomes of people who had established no-fish zones were more than double those who did not have protected areas, the authors found.

The researchers produced the report for the Nature Conservancy, a US group.

They said the case studies provided a global blueprint for fishing villages.

Their report, Nature's Investment Bank, examined four marine protection areas in Fiji, Indonesia, Philippines and the Solomon Islands, to assess what constituted a successful scheme.

"The key finding is that local communities have to be involved in the management of the fisheries," said co-author Craig Leisher, a policy adviser for the Nature Conservancy.

> **There has to be a sense of crisis before people are willing to change the status quo dramatically**
> Craig Leisher, The Nature Conservancy

"It lowers the enforcement costs dramatically, and it ensures locals benefit financially."

Marine protection areas are designed to ensure fish stocks are maintained, while allowing locals to land catches. However, fishing is prohibited in certain key locations, such as spawning and nursery areas.

He said locals initially expressed concern about the idea of establishing so called "no-take zones".

"Local fishers were quite reluctant, and worried that they were going to lose some of their prime fishing grounds.

"But what we saw in at least two of these sites was that within just two or three years, there was a dramatic increase in the number of fish that were spilling over from the no-take zones.

"It did not take long for the local communities to see the benefits and say 'hey, this may work'."

Net benefits

As well as money from fishing, Mr Leisher added that a healthy aquatic ecosystem had other financial incentives.

"When we looked at the new jobs that were created and which had the biggest benefit to local communities, they were all in tourism.

"There is tremendous potential, certainly within South-East Asia and what we call the coral triangle," he told BBC News.

In some areas, the additional revenue helped fund improvements to villages' infrastructure, such as water tanks and public toilets.

Mr Leisher said that fish also played a vital role in locals' diets, especially children's.

"In all four areas, fish was their primary source of protein and it is part of their staple diet so it could not be more important," he observed.

Secrets of success

The report - co-funded by the Nature Conservancy, WWF Indonesia, the Australian government and Holland's Vrije University - was based on more than 1,100 interviews with locals and opinion formers.

Mr Leisher said the researchers had deliberately chosen areas where the introduction of conservation schemes had been successful.

"The objective was to learn from the sites that had been successful and to discern why they were successful, and look for the common factors," he explained.

"In all four cases, the local fisheries were in crisis before the establishment of the protected areas.

"The primary indicator was declining fish catch - what we called catch per unit of effort. People were having to go out for longer and fish in new places in order to catch the same amount of fish as a few years earlier.

"There has to be a sense of crisis before people are willing to change the status quo dramatically."

But he said the main factor underpinning the successful schemes was convincing people that marine protection areas were more than a paper exercise.

"The key to the whole endeavour is education and awareness; they had to understand that it was something that could benefit them and that it was not an imposition."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7119913.stm

Published: 2007/11/30 15:14:26 GMT

Skin ageing 'reversed' in mice
Scientists have reversed the effects of ageing on the skin of mice by blocking the action of a specific protein.

In two-year old mice, Californian researchers found that they could rejuvenate skin to look more youthful.

Further analysis published in the journal Genes and Development showed the skin had the same genetic profile as the skin of newborn mice.

The team said the research would most likely lead to treatments to improve healing in older human patients.

They stressed it was unlikely to be a potential "fountain of youth" but could help older people heal as quickly from injury as they did when they were younger.

The protein in question - NF-kappa-B - is thought to play a role in numerous aspects of ageing.

We found a pretty striking reversal to that of the young skin
Dr Howard Chang
Dr Chang interview

It acts as a regulator, causing a wide range of other genes to be more or less active.

Lead researcher, Dr Howard Chang, from the Stanford School of Medicine in California, said the findings supported the theory that ageing is the result of specific genetic changes rather than accumulated wear and tear.

And that it is possible to reverse those genetic changes later in life.

Regulation

Previous studies have identified several genes which play a part in the ageing process.

Dr Chang and colleagues spotted that the one thing the genes had in common was that they were regulated by NF-kappa-B, which can either make them more or less active.

By blocking the protein in older mice for two weeks, they found the skin was thicker and more cells appeared to be dividing, much like the skin of a younger mouse.

And the same genes were active as in the skin of newborn mice.

It is unclear whether the effects are long-lasting and the protein has also been implicated in cancer and regulation of the immune system.

"We found a pretty striking reversal to that of the young skin," Dr Chang said.

But he added any application in humans was likely to be on a short-term basis because of other effects of blocking the protein.

"You might get a longer lifespan but at the expense of something else," he said.

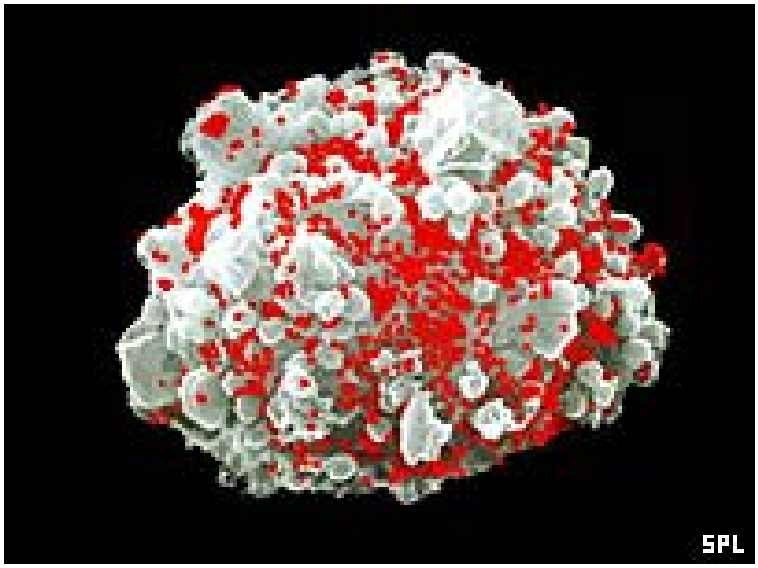
Nina Goad from the British Association of Dermatologists said: "Targeting of gene therapy to skin is still very difficult but this may provide some new avenues of research that will be of value to wound healing, following skin trauma or disfiguring skin cancer surgery.

"However, the researchers' caveats about the unforeseen consequences of manipulating genes that play a role in many cells are most important and add a strong element of caution."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7119552.stm

Published: 2007/11/30 00:18:02 GMT

Concern over HIV homeopathy role
Doctors and health charities have expressed concern about a conference which will examine the role of homeopathy in treating HIV.



The event includes discussion of what have been described as "healing remedies" for HIV and AIDS. One of the speakers believes that the treatment, involving flower essences, can be used to halt the AIDS epidemic.

But the event, which marks World AIDS Day, has been criticised by doctors who say the treatment is not effective. About 80 homeopaths and workers from HIV projects are gathering for the workshop in south London today.

'**Ineffective**'

It will include discussion about a remedy for HIV and AIDS which is said to have been used in Africa for five years. BBC health correspondent, Jane Dreaper explained: "The principle behind homeopathy is that an ailment can be cured by small quantities of substances that produce the same symptoms but some doctors say it's ineffective."

Medical charity, HealthWatch, has criticised the event.

Its chairman said the number of AIDS cases in Africa had been exacerbated by a refusal to accept scientific knowledge about the condition. The Terrence Higgins Trust, which campaigns on HIV issues, said homeopathic remedies alone could not reduce the activity of the virus, nor halt the onset of AIDS.

The Society of Homeopaths, which is organising the event, said it wanted to promote a constructive and open debate but it was not offering a cure.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/7122370.stm

Published: 2007/12/01 02:23:43 GMT

Fast-Acting Carbs May Hasten Vision Loss Over Time

A study this year confirms earlier findings linking high consumption of fast-acting carbs over time with age-related macular degeneration (AMD). Above, top: a simulation of AMD-related vision loss compared to (bottom) normal vision. (Credit: National Eye Institute, National Institutes of Health)

ScienceDaily (Dec. 1, 2007) — Consuming higher-than-average amounts of carbohydrates that cause blood sugar levels to spike and fall rapidly could be a risk factor for central vision loss with aging.

The study was led by Chung-Jung Chiu with Allen Taylor, both at the Jean Mayer USDA Human Nutrition Research Center on Aging (HNRCA) in Boston, Mass. Taylor is director of the Laboratory for Nutrition and Vision Research at the HNRCA.

The researchers analyzed dietary intake and other data from more than 4,000 men and women aged 55 to 80 participating in the Age-Related Eye Disease Study, or AREDS.

Diets high in carbohydrates that are quickly digested and absorbed, resulting in a rapid rise in blood sugar levels, are considered high-glycemic-index diets. Examples of such "fast carb" foods are white bread, rice, potatoes and pasta, and also sugars and corn syrups. Carbohydrates leading to a more gradual rise and fall in blood sugar levels comprise low-glycemic-index diets. Such "slow carb" foods include whole-grain versions of bread, rice and pasta.

Central vision loss is one of the first signs of age-related macular degeneration (AMD), a disease that is one of the leading causes of blindness among the elderly.

Consuming a diet high in fast carbs is also suspected of being involved in the vision loss that sometimes occurs in people with diabetes. The researchers theorize that the type of damage to eye tissue produced by fast carbs could be similar in both AMD and diabetic eye disease.

At this time, there is no effective cure for AMD, so finding modifiable risk factors is important. While it's too soon to recommend dietary slow carbs as a preventive strategy for AMD, replacing fast carbs with whole grains may soon prove to be an early dietary intervention to slow its progression.

Scientists supported by the Agricultural Research Service (ARS) and grants reported the findings this year in the American Journal of Clinical Nutrition.

Adapted from materials provided by US Department of Agriculture.

http://www.sciencedaily.com/releases/2007/11/071126153729.htm

Recipe For A Storm: Ingredients For More Powerful Atlantic Hurricanes

This satellite image composite shows Hurricane Floyd off the Atlantic coast in 1999. UW-Madison researchers Jim Kossin and Dan Vimont have established a connection between an atmospheric circulation pattern known as the Atlantic Meridional Mode and the strength of Atlantic hurricanes. (Credit: Cooperative Institute of Meteorological Satellite Studies)

ScienceDaily (Nov. 30, 2007) — As the world warms, the interaction between the Atlantic Ocean and atmosphere may be the recipe for stronger, more frequent hurricanes.

University of Wisconsin-Madison scientists have found that the Atlantic organizes the ingredients for a powerful hurricane season to create a situation where either everything is conducive to hurricane activity or nothing is-potentially making the Atlantic more vulnerable to climate change than the world's other hurricane hot spots.

After the 2004 and 2005 hurricane seasons, many worry what Atlantic hurricane seasons will look like in a warmer world. Evidence indicates that higher ocean temperatures add a lot of fuel to these devastating storms. In a paper published today in the "Bulletin of the American Meteorological Society," co-authors Jim Kossin and Dan Vimont caution against only looking at one piece of the puzzle. "Sea surface temperature is a bit overrated," says Kossin, an atmospheric scientist at UW-Madison's Cooperative Institute of Meteorological Satellite Studies. "It's part of a larger pattern."

Kossin and Vimont, a professor in the Department of Atmospheric and Oceanic Sciences, noticed that warmer water is just one part of a larger pattern indicating that the conditions are right for more frequent, stronger hurricanes in the Atlantic. The atmosphere reacts to ocean conditions and the ocean reacts to the atmospheric situation, creating a distinct circulation pattern known as the Atlantic Meridional Mode (AMM). The AMM unifies the connections among the factors that influence hurricanes such as ocean temperature, characteristics of the wind, and moisture in the atmosphere.

Finding that a basin-wide circulation pattern drives Atlantic hurricane activity helps explain evidence of significant differences in long-term hurricane trends among the world's basins. In a study published last February, Kossin and his co-authors created a more consistent record of hurricane data that accounted for the significant improvement in storm detection that followed the advent of weather satellites. An analysis of this recalibrated data showed that hurricanes have become stronger and more frequent in the Atlantic Ocean over the last two decades. The increasing trend, however, is harder to identify in the world's other oceans.

Kossin and Vimont wanted to determine why long-term trends in the Atlantic looked different from those in other basins, particularly in the Pacific, where the majority of the world's hurricane activity occurs. "The AMM helps us understand why hurricanes in the Atlantic react differently to climate changes than those in the Pacific," Vimont says. According to Vimont, the other oceanic basins have their own modes of variability.

Understanding how factors vary together provides a new framework from which to consider climate change and hurricanes. "Our study broadens the interpretation of the hurricane-climate relationship," Vimont says.

Looking at the larger set of varying conditions provides a more coherent understanding of how climate change affects hurricane activity. In the Atlantic, warmer water indicates that other conditions are also ideal for hurricane development. However, in the Pacific, a hurricane-friendly environment goes along with cooler ocean temperatures in the area where the storms spend their lives. The inconsistent relationship with sea surface temperature leads Vimont and Kossin to conclude that the connection between hurricane activity and climate variability hinges on more than just changes in ocean temperatures.

"You can never isolate one factor on this planet," Kossin says. "Everything is interrelated."

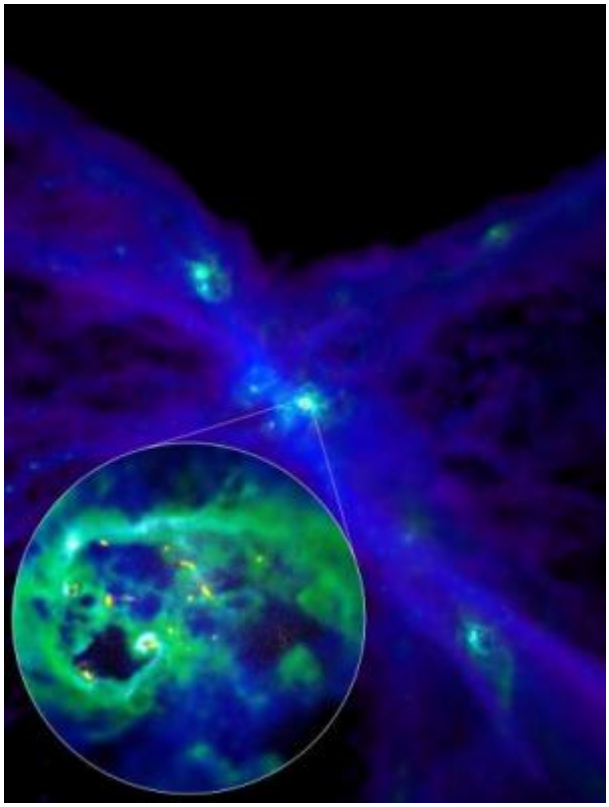
Depending on the other conditions hurricanes care about, warmer oceans can mean different outcomes. Concentrating on how the atmosphere and the ocean work together helps hurricane researchers see the bigger picture. Because higher sea surface temperatures in the Atlantic act in concert with the AMM, Vimont and Kossin suggest that Atlantic hurricanes will be more sensitive to climate changes than storms in other ocean basins.

In addition to helping researchers understand and predict the effects of climate change on hurricane activity, Vimont and Kossin can forecast the AMM up to a year in advance. If the AMM is positive, all the conditions are right for hurricane development. If it is negative, those living on the coasts can generally expect a quieter hurricane season. Vimont and Kossin plan to further develop their AMM forecasts for use during the hurricane season. The duo also hopes to continue to research the physical relationships that constitute the AMM as well as how future climate change will affect these modes of climate variability.

Adapted from materials provided by University of Wisconsin-Madison.

http://www.sciencedaily.com/releases/2007/11/071129183753.htm

Galaxies Are Born Of Violence Between Dark Matter and Interstellar Gas



Dwarf galaxy forming one billion years after the Big Bang. The background image shows the large-scale cosmic context (the panel is approximately 100,000 light years across); the inset shows the central 2,000 light years of the dwarf galaxy where powerful feedback from newly born star clusters drives bulk motions in the gas. Stars are shown in yellow; colours from violet to blue to green to white correspond to gas of increasing density. (Credit: S. Mashchenko, J. Wadsley, and H. M. P. Couchman)

ScienceDaily (Nov. 30, 2007) — Researchers using supercomputer simulations have exposed a very violent and critical relationship between interstellar gas and dark matter when galaxies are born -- one that has been largely ignored by the current model of how the universe evolved.

The findings, published in Science, solve a longstanding problem of the widely accepted model -- Cold Dark Matter cosmology -- which suggests there is much more dark matter in the central regions of galaxies than actual scientific observations suggest.

"This standard model has been hugely successful on the largest of scales--those above a few million light-years--but suffers from several persistent difficulties in predicting the internal properties of galaxies," says Sergey Mashchenko, research associate in the Department of Physics & Astronomy at McMaster University. "One of the most troublesome issues concerns the mysterious dark matter that dominates the mass of most galaxies."

Supercomputer cosmological simulations prove that indeed, this problem can be resolved. Researchers modeled the formation of a dwarf galaxy to illustrate the very violent processes galaxies suffer at their births, a process in which dense gas clouds in the galaxy form massive stars, which, at the ends of their lives, blow up as supernovae.

"These huge explosions push the interstellar gas clouds back and forth in the centre of the galaxy," says Mashchenko, the lead author of the study. "Our high-resolution model did extremely accurate simulations, showing that this 'sloshing' effect -- similar to water in a bathtub-- kicks most of the dark matter out of the centre of the galaxy."

Cosmologists have largely discounted the role interstellar gas has played in the formation of galaxies and this new research, says Mashchenko, will force scientists to think in new terms and could lead to a better understanding of dark matter.

The simulations reported in the research paper were carried out on the Shared Hierarchical Academic Research Computing Network (SHARCNET).

Adapted from materials provided by McMaster University.

http://www.sciencedaily.com/releases/2007/11/071129183827.htm

Human Genome Has Four Times More Imprinted Genes Than Previously Identified

In classic genetics, children inherit two copies of a gene, one from each parent, and both actively shape how the child develops. But in imprinting, one of those copies is turned off by molecular instructions coming from either the mother or the father. (Credit: Jane Ades, NHGRI)

ScienceDaily (Nov. 30, 2007) — Scientists at Duke University have created the first map of imprinted genes throughout the human genome, and they say a modern-day Rosetta stone -- a form of artificial intelligence called machine learning -- was the key to their success. The study revealed four times as many imprinted genes as had been previously identified.

In classic genetics, children inherit two copies of a gene, one from each parent, and both actively shape how the child develops. But in imprinting, one of those copies is turned off by molecular instructions coming from either the mother or the father. This process of "imprinting" information on a gene is believed to happen during the formation of an egg or sperm, and it means that a child will inherit only one working copy of that gene. That's why imprinted genes are so vulnerable to environmental pressures: If the only functioning copy is damaged or lost, there's no backup to jump in and help out.

Many of the newly-identified imprinted genes lie within genomic regions linked to the development of major diseases like cancer, diabetes, autism, and obesity. Researchers say that if some of these genes are later shown to be active in these disorders, they may offer clues to better disease prevention or management.

"Imprinted genes have always been something of a mystery, partly because they don't follow the conventional rules of inheritance," says Dr. Randy Jirtle, a genetics researcher in the departments of radiation oncology and pathology at Duke and a senior author of the study. "We're hoping this new roadmap will help us and others find more information about how these genes affect our health and well-being."

The technical wizardry needed to find the genes fell to Dr. Alexander Hartemink, the other senior author of the study and an assistant professor in Duke's department of computer science, and Philippe Luedi, the first author of the study. They fed sequence data from two types of genes -- ones known to be imprinted and ones believed not to be imprinted -- into a computer and asked it to discover the differences. This machine learning approach led to an algorithm, which was able -- like the original Rosetta stone -- to decode seemingly impenetrable data, in this case, specific DNA sequences that pointed to the presence of imprinted genes.

"We can't say for certain that we identified all of them, but we think we found a large number," says Hartemink.

Jirtle, who has studied imprinting for years, notes that imprinting is an epigenetic event, meaning it's something that can change a gene's function without altering the sequence of its DNA. "Imprinted genes are unusually vulnerable to pressures in our environment -- even what we eat, drink, and breathe. On top of that, epigenetic changes can be inherited. I don't think people realize that."

Several years ago, Jirtle showed that Agouti mice -- normally fat and yellow -- when fed certain dietary supplements, would produce brown, normal weight babies. The babies' Agouti genes, the ones responsible for color, were the same as the mother's, yet they looked different. "That's epigenetics in action," says Jirtle.

It's estimated that imprinted genes comprise about 1 percent of the human genome, and until now, only several dozen had been identified. Using their new "Rosetta stone", however, Jirtle and Hartemink found 156 new likely imprinted genes, and validated two particularly interesting ones on chromosome 8, where none had been found before. One of them, KCNK9, is mostly active in the brain, is known to cause cancer, and may also be linked to bipolar disorder and epilepsy. The second, DLGAP2, is a possible bladder cancer tumor suppressor gene.

Hartemink says experiments to confirm that all 156 new genes are truly imprinted -- and not just statistically likely candidates -- will be difficult, mostly because gene expression varies from tissue to tissue and most genes turn on and off over time. "We've certainly narrowed the field, but we have a whole lot of work ahead of us."

This research is published in the December 3 issue of Genome Research.

Grants from the National Institutes of Health, National Science Foundation, U.S. Department of Energy and the Alfred Sloan Foundation supported the research.

Duke colleagues who also contributed to the work include Fred Dietrich, from the department of molecular genetics and microbiology; Jennifer Weidman, from the department of radiation oncology and Jason Bosko, an undergraduate in the department of computer science.

Adapted from materials provided by Duke University Medical Center.

http://www.sciencedaily.com/releases/2007/11/071130075016.htm

Astronomers Find Stellar Cradle Where Planets Form

A rare, infrared view of the very young star L1157 with its flaring jets from NASA's Spitzer Space Telescope (right) shows us what our own solar system might have looked like billions of years ago. In visible light, this star and its surrounding regions appear black (left). The reddish haze all around the Spitzer image (right) is dust. The white dots are other stars, mostly in background. The Spitzer image has infrared light of 8 microns is colored red; 4.5-micron infrared light is green; and 3.6-micron infrared light is blue. The visible-light picture is from the Palomar Observatory-Space Telescope Science Institute Digitized Sky Survey. Blue visible-light is blue; red visible light is green, and near-infrared light is red. (Credit: NASA, JPL Cal Tech, L. Looney (University of Illinois))

ScienceDaily (Nov. 30, 2007) — Astronomers at the University of Illinois have found the first clear evidence for a cradle in space where planets and moons form. The cradle, revealed in photographs taken with NASA's Spitzer Space Telescope, consists of a flattened envelope of gas and dust surrounding a young protostar.

"We are seeing this object in the early stages of stellar birth," said U. of I. astronomy professor Leslie Looney, the lead author of a paper accepted for publication in Astrophysical Journal Letters. "Eventually, the protostar will form into a star much like our sun, and the disk will form into planets and moons."

Located about 800 light-years away in the constellation Cepheus, the object is obscured by dust and therefore invisible to the eye. However, the Spitzer Space Telescope's sensitive infrared camera can penetrate the dust, and reveal the structures within.

The brightest structure consists of an enormous, almost linear flow of shocked molecular hydrogen gas erupting from the protostar's two magnetic poles. These bipolar jets are so long, light would take about 1 1/2 years to travel from one end to the other.

In star-formation theory, a cloud of gas and dust collapses to form a star and its planets. As the cloud collapses, it begins to rotate faster and faster, like a pirouetting ice skater pulling in her arms. The force of the growing magnetic field ejects some of the gas and dust along the magnetic axis, forming the bipolar jets seen in the photograph.

"If material was not shed in this fashion, the protostar's spin would speed up so fast it would break apart," Looney said.

The planet-forming region is perpendicular to, and roughly centered on the polar jets. There, seen in silhouette against a bright background of galactic infrared emission, is the flattened disk of a circumstellar envelope.

Theorized, but never before seen, the flattened disk is an expected outcome for cloud-collapse theories that include magnetic fields or rotation.

"Some theories had predicted that envelopes flatten as they collapse onto their stars and surrounding planet-forming disks," Looney said, "but we hadn't seen any strong evidence of this until now."

With Looney, co-authors of the paper are former undergraduate student John Tobin (now at the University of Michigan) and graduate student Woojin Kwon.

The Spitzer Space Telescope is operated by the Jet Propulsion Laboratory at the California Institute of Technology. Funding was provided by NASA.

Adapted from materials provided by University of Illinois.

http://www.sciencedaily.com/releases/2007/11/071129141146.htm

Computer Scientists Create New Technology For Elderly Home Owners

November 1, 2007 — Computer scientists have designed technologies to help the elderly maintain their independence. One device uses optical sensors to oversee people as they pick up and use items. Another device uses radio frequency identification technology to track which medications have been taken and when. Additionally a variety of sensors at a house can send information on the weather, activity of a person, and other information over the internet to another house, where a picture frame displays the findings graphically.

The United States is in the middle of a longevity revolution. The average person is expected to live to be 77. Boomers will hit 65 in 2011. Homes are going high tech to help us as we grow older.

After 70 years of marriage Ross and Helen Tipton still make beautiful music together. They're just two of more than 60 million seniors in America facing new technology head on!

"We are very fortunate and lucky to have found each other," Helen told Ivanhoe. "He's learned computer at his age, well I think that's a miracle." His computer may come in handy. Computer scientists and human factors psychologists at Georgia Tech have developed the 'technology coach.' It takes complicated tasks such as checking your glucose level and breaks it down step-by-step on the computer.

"On the box it says it's as easy as 1-2-3 but when you fold out the list of instructions, it's actually 53 steps," Brian Jones, a computer researcher at Georgia Tech, told Ivanhoe.

The technology coach uses optical sensors on an overhead camera. It can tell if a person has picked up the wrong bottle, or if they are doing the steps out of order. The screen then reveals the problem and shows how to fix it. One day this technology may be used for more than just medicine. It could be applied to programming DVD players, TVs and answering machines.

Another problem for seniors is remembering and taking their medication. This 'memory mirror' may be the answer. "The memory mirror allows people to manage medication by showing them what they've done, what they need to do, but it does not force them to do it," Elizabeth Mynatt, human centered computing expert at Georgia Tech, told Ivanhoe.

It uses radio frequency barcodes to track what medication has been taken and when.

And new technology is not just keeping track of medication ... but it's also keeping track of people. "One of the things we talked to older adults about, would you be accepting of having people monitor your home and one common response is, 'well, if I know who is doing the monitoring.'" Wendy Rogers, PhD, professor of psychology at Georgia Tech, told Ivanhoe.

You can get something that looks like a portrait of Mom -- but it will actually say so much more. Butterflies around the portrait show how active she has been during the day. The bigger the butterfly, the more movement; the movement is picked up by sensors placed around the house. It can show up to 28 days of information; so family members can see patterns.

"You don't just want to know how your Mom is doing on a particular day, but you're concerned maybe there are a few days in a row where things seem pretty quiet, maybe your Mom is sick," Rogers explained. Just a few new ideas that will help seniors like Helen and Ross Tipton keep living and loving life. *The Human Factors and Ergonomics Society contributed to the information contained in the TV portion of this report.*

http://www.sciencedaily.com/videos/2007/1102-digital_grandparents.htm

Cellular Pathway Identified That Makes Prostate Cancer Fatal

ScienceDaily (Dec. 1, 2007) — Expanding evidence that tiny strands of RNA – called microRNAs – play big roles in the progress of some cancers, UC Davis researchers have identified one that helps jump start prostate cancer cell growth midway through the disease process, eventually causing it to become fatal. The discovery is an important link to finding new treatments targeting this cellular function and reducing cancer deaths among American men. "A number of cancer researchers are interested in microRNAs and how they are involved in diseases like leukemia," said Ralph deVere White, director of the UC Davis Cancer Center, professor of urology and senior author on the study. "But this is the first research to specifically look at the functional effects of microRNAs on the progression of prostate cancer."

Relatively new discoveries in genetic research, microRNAs are small, single strands of RNA that regulate gene expression processes between larger strands of RNA. Working with 19 samples from the cancer center's repository of prostate cancer cells, deVere White and his team used high-resolution analysis techniques to identify microRNAs that were differentially expressed. Of five that were distinct, one – miR-125b – caught their attention because of its presence at high levels in both androgen-dependent and androgen-independent prostate cancer cells.

Androgens, such as testosterone, are known to promote tumor growth. While androgen suppression treatments slow the progress of prostate cancer, they do not cure it. "One of the most confounding things about prostate cancer is that after a period of success with androgen suppression therapy, the cancer starts to thrive again," deVere White explained. "That's when the disease becomes fatal. This particular microRNA supports the ability of prostate cancer cells to exist and grow in its androgen-independent state. And we currently have no effective treatments for the androgen-independent state of the disease."

Now having identified a cellular link between the two phases of prostate cancer, deVere White and colleagues are hopeful that miR-125b screening will at some point become a standard diagnostic tool and that genetic and chemotherapy treatments can be developed that remove this essential survival mechanism for cancer cells. Before this can happen, the team needs to first find out if a microRNA "knockout" can be safely accomplished.

"We simply don't know yet all that microRNAs do for us," said deVere White. "We will use animal models to see if we can reduce or remove one of more of them without interfering with other essential molecular functions."

Another important next step is to identify the full range of microRNAs involved in prostate cancer.

"There are believed to be thousands of microRNAs, and we have only identified a handful that is important to prostate cancer," said Xu-Bao Shi, a project scientist with the UC Davis Department of Urology and lead author on the study. "We must next identify if others are involved along with their regulating patterns and mechanisms in order to gain a more comprehensive picture of how they contribute to the onset and progression of the disease. Our study definitely opens up a whole new avenue in prostate cancer research."

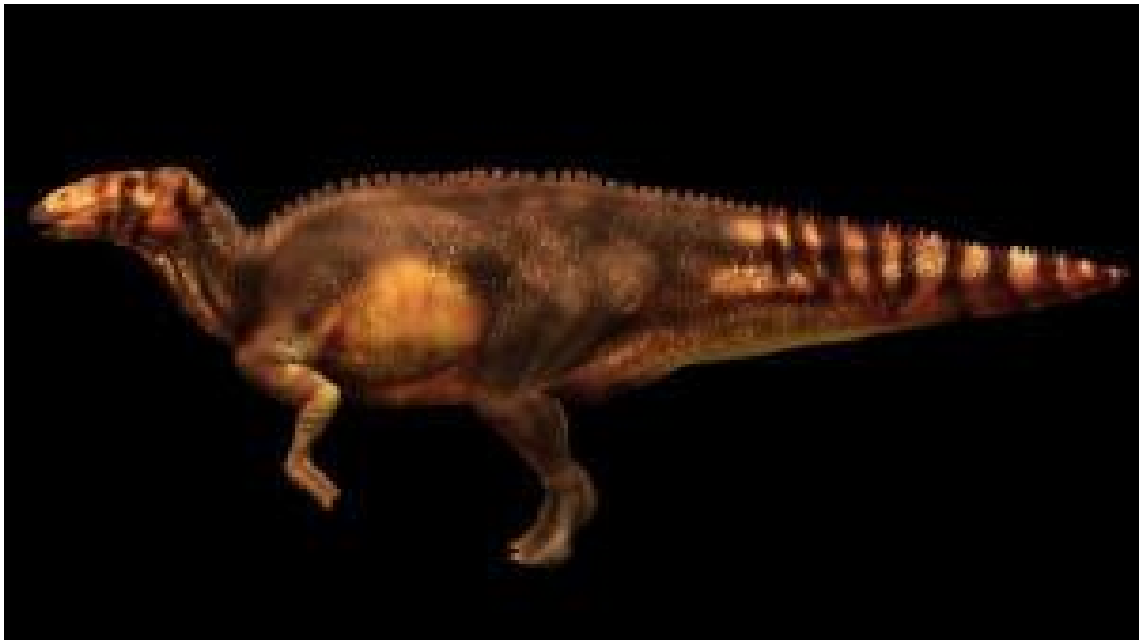
Besides skin cancer, prostate cancer is the most common malignancy in American men. It is estimated that 218,890 men in the United States will be diagnosed with and 27,000 men will die of prostate cancer in 2007.

The study will be published in the Proceedings of the National Academy of Sciences.

Adapted from materials provided by University of California, Davis.

http://www.sciencedaily.com/releases/2007/11/071127150428.htm

Dinosaur Mummy Found With Fossilized Skin And Soft Tissues



The hadrosaur, nicknamed Dakota, as scientists believe it would have looked, based on their analysis of the fossil evidence so far. (Credit: Copyright: Julius T. Csotonyi and 3D model by 422 South/National Geographic Television Art and Animation)

ScienceDaily (Dec. 3, 2007) — National Geographic has announced the amazing discovery of one of the finest and rarest dinosaur specimens ever unearthed -- a partially intact dino mummy found in the Hell Creek Formation Badlands of North Dakota by 16-year-old fossil hunter Tyler Lyson on his uncle's farm.

The story of the find, the excavation of the mummy and its painstaking analysis by a team of international scientists is told in a new book from National Geographic, Grave Secrets of Dinosaurs: Soft Tissues and Hard Science, by internationally renowned British paleontologist Phillip Manning. This gripping detective story examines a 65-million-year case so cold it's the hottest development in modern dinosaur hunting.

The fossilized remains, discovered in 1999, included not just bones, but fossilized soft tissues like skin, tendons and ligaments. Most importantly, it was the first-ever find of a dinosaur where the skin "envelope" had not collapsed onto the skeleton. This has allowed scientists to calculate muscle volume and mass for the first time. The fact that the skin is mostly intact allows for the exciting possibility that some of its original chemistry is still present.

In this fascinating book Manning tells how he and Lyson --- now a geology and geophysics graduate student at Yale University -- and a multidisciplinary team of scientists embarked on an extraordinary project to excavate, preserve and analyze the ancient, enormous creature they have dubbed Dakota, using hard-won experience and cutting-edge technology to peer millions of years into prehistory. The result is an accurate and revealing portrait of a single dinosaur and the Late Cretaceous world in which it lived.

"The fossilized bones of the hadrosaur that Tyler discovered would allow the resurrection of many grave secrets locked in stone for more than 65 million years. The presence of rare soft-tissue structures would ensure that this fossil would become a member of a prehistoric elite - dinosaur mummies... Such remarkable fossils enable immense advances in our understanding of long-vanished lives and forgotten worlds," writes Manning in his prologue.

The book is more than a vivid window into a far distant past. It's also an account of more than a century of paleontological pioneers and accomplishments and a portrait of the state of the art in modern paleontology. Manning takes readers on a chronological tour of the handful of dinosaur mummies that have teased the scientific community since 1908, when the first remarkably preserved example was discovered and excavated by the legendary Sternberg family.

Since then, similar discoveries from Italy to China and from North America to Patagonia have added to our knowledge and understanding of these remarkable fossils - but none so much as Dakota, whose secrets are being explored by Manning's international team of scientists who work with everything from tweezers, plaster and burlap to protein analysis, electron microscopes and the world's largest CT scanner -- originally built to examine NASA spacecraft -- as they excavate, record, analyze and interpret this incredible 8,000-pound find. The field research was partly funded by the National Geographic Society.

Among the exciting discoveries are a fleshy pad on Dakota's palm, hooves on its feet made of keratin, and well-preserved skin scales that vary in size and shape across the body, tail, arms and legs of the dinosaur.

The National Geographic Channel will air a documentary on this unprecedented find on Sunday, Dec. 9, at 9 p.m. ET/10 p.m. PT. "Dino Autopsy" offers never-before-seen details of what dinosaurs really looked like, as well as clues to how they moved and lived. Using the giant CT scanner provided by the Boeing company at a NASA facility, scientists will attempt to peer inside the preserved body and tail. Their findings may alter our perception of dinosaurs' body shape, skin texture and locomotion. Significant findings have already been made. The hadrosaur's backside is some 25 percent bigger than originally thought, enabling it to reach speeds of 28 mph - 10 mph faster than T. rex.

More details on the discovery of Dakota and dinosaurs in general can be found at http://www.nationalgeographic.com/dinosaurs. National Geographic Channel's interactive Web site on dinosaurs can be found at http://www.NGCDinos.com.

Phillip Manning is a paleontologist, fossil hunter and writer. He has taught vertebrate paleontology and evolution at the universities of Liverpool and Manchester and currently heads the vertebrate paleontology research group at the University of Manchester (U.K.). He has worked in museums on the Isle of Wight, Clitheroe, York and Manchester and has held several curatorial positions. His research is both broad and diverse, and he has published papers on dinosaur tracks, theropod biomechanics, arthropod paleobiology, vertebrate locomotion and the evolution of respiration and flight in birds.

Adapted from materials provided by National Geographic Society.

http://www.sciencedaily.com/releases/2007/12/071203103349.htm

Helium Isotopes Point To New Sources Of Geothermal Energy

Arizona State geochemist Matthijs van Soest samples surface water in the northern Basin and Range. The sample is collected without direct exposure to air and stored in the copper tube, foreground left, which will be sealed by crimping. (Credit: Image courtesy of DOE/Lawrence Berkeley National Laboratory)

ScienceDaily (Dec. 3, 2007) — With fossil fuel sources depleting and global warming on the rise, exploring alternative means of power for humans is a necessary reality. Now, looking to the sky, relying on the wind or harnessing water power are not the only remaining options. Deep within Earth is an untapped source of energy: geothermal energy.

It has been estimated that within the continental United States, there is a sizable resource of accessible geothermal energy -- about 3,000 times the current annual U.S. consumption.

Two important reasons this storehouse of energy has not been tapped is that locating the specific energy hot spots is difficult and expensive.

"Since many geothermal resources are hidden, that is, they do not show any clear indications of their presence at the surface, locating them by just using observations made at the surface is difficult," explains Matthijs van Soest, associate research professional at the Noble Gas Geochemistry and Geochronology Laboratory within the School of Earth and Space Exploration at Arizona State University.

"Often when people thought there might be a geothermal resource below the surface the only way to determine if their assumption was correct was drilling and drilling is extremely expensive," he says.

Now, research by van Soest and B. Mack Kennedy at Lawrence Berkeley National Laboratory reveals that geothermal exploration doesn't have to be high-priced.

And it doesn't even have to require drilling.

In a survey of the northern Basin and Range province of the western United States, geochemists Mack Kennedy of the Department of Energy's Lawrence Berkeley National Laboratory and Matthijs van Soest of Arizona State University have discovered a new tool for identifying potential geothermal energy resources.

Currently, most developed geothermal energy comes from regions of volcanic activity, such as The Geysers in Northern California. The potential resources identified by Kennedy and van Soest arise not from volcanism but from the flow of surface fluids through deep fractures that penetrate the earth's lower crust, in regions far from current or recent volcanic activity.

"A good geothermal energy source has three basic requirements: a high thermal gradient — which means accessible hot rock — plus a rechargeable reservoir fluid, usually water, and finally, deep permeable pathways for the fluid to circulate through the hot rock," says Kennedy, a staff scientist in Berkeley Lab's Earth Sciences Division. "We believe we have found a way to map and quantify zones of permeability deep in the lower crust that result not from volcanic activity but from tectonic activity, the movement of pieces of the Earth's crust."

Kennedy and van Soest made their discovery by comparing the ratios of helium isotopes in samples gathered from wells, surface springs, and vents across the northern Basin and Range. Helium-three, whose nucleus has just one neutron, is made only in stars, and Earth's mantle retains a high proportion of primordial helium-three (compared to the minuscule amount found in air) left over from the formation of the solar system.

Earth's crust, on the other hand, is rich in radioactive elements like uranium and thorium that decay by emitting alpha particles, which are helium-four nuclei. Thus a high ratio of helium-three to helium-four in a fluid sample indicates that much of the fluid came from the mantle.

High helium ratios are common in active volcanic regions, where mantle fluids intrude through the ductile boundary of the lower crust. But when Kennedy and van Soest found high ratios in places far from volcanism, they knew that mantle fluids must be penetrating the ductile boundary by other means.

The geology of the region was the clue. The Basin and Range is characterized by mountain ranges that mostly run north and south, separated by broad, relatively flat-floored valleys (basins), which are blocks of crust that have sunk and become filled with sediment eroded from the uplifted mountains. The alternating basin and range topography is the result of crustal spreading by east to west extension, which has occurred over the past approximately 30 million years. The Earth's crust in the Basin and Range is some of the thinnest in the world, resulting in unusually high thermal gradients.

The faces of mountain blocks in the Basin and Range clearly exhibit the normal faults that result as the blocks are pulled apart by the extension of the crust. Normal faults form high-angle pathways deep down into the brittle upper crust. But as the fault plane approaches the ductile lower crust, changes in the density and viscosity of the rock refract the principle stress acting on the fault, deflecting the fault plane, which becomes more horizontal. It is from these deep, horizontally-trending faults that Kennedy thinks permeable passageways may emanate, penetrating the ductile boundary into the mantle.

One of the most seismically active areas in the Basin and Range occurs in what is called the central Nevada seismic belt. The researchers' detailed studies in this area, notably at the Dixie Valley thermal system next to the Stillwater range, established that the highest helium ratios were restricted to fluids emerging from the Stillwater range-front fault system.

The northern Basin and Range, which Kennedy and van Soest surveyed on behalf of DOE's Office of Basic Energy Sciences and Office of Geothermal Technologies, includes parts of California, Nevada, Oregon, Idaho, and Utah. In their survey the researchers mapped the steady progression from low helium ratios in the east to high ratios in the west. The distribution of the increasing ratios corresponds

remarkably with an increase in the rate and a change in the direction of crustal extension, which shifts from an east to west trend across the Basin and Range to a northwest trend.

This change in rate and direction reflects the added shear strain induced by the northward movement of the Pacific Plate past the North American Plate. Kennedy and van Soest believe that the added component of shear strain and increasing extension rate tear open fluid pathways through the ductile lower crust, into the mantle. The high helium isotope ratios they found, indicating potential new sources of geothermal energy, were superimposed upon the general background trend: anomalously high ratios map zones of higher than average permeability.

"We have never seen such a clear correlation of surface geochemical signals with tectonic activity, nor have we ever been able to quantify deep permeability from surface measurements of any kind," says Kennedy. The samples they collected on the surface gave the researchers a window into the structure of the rocks far below, with no need to drill.

With the urgent need to find energy sources that are renewable and don't emit greenhouse gases, geothermal energy is ideal — "the best renewable energy source besides the sun," Kennedy says. Accessible geothermal energy in the United States, excluding Alaska and Hawaii, has been estimated at 9 x 1016 (90 quadrillion) kilowatt-hours, 3,000 times more than the country's total annual energy consumption. Determining helium ratios from surface measurements is a practical way to locate some of the most promising new resources.

Journal reference: "Flow of Mantle Fluids Through the Ductile Lower Crust: Helium Isotope Trends," B. Mack Kennedy and Matthijs C. van Soest, Science, 30 November 2007 .

Adapted from materials provided by DOE/Lawrence Berkeley National Laboratory.

http://www.sciencedaily.com/releases/2007/11/071129183725.htm