

Phactum

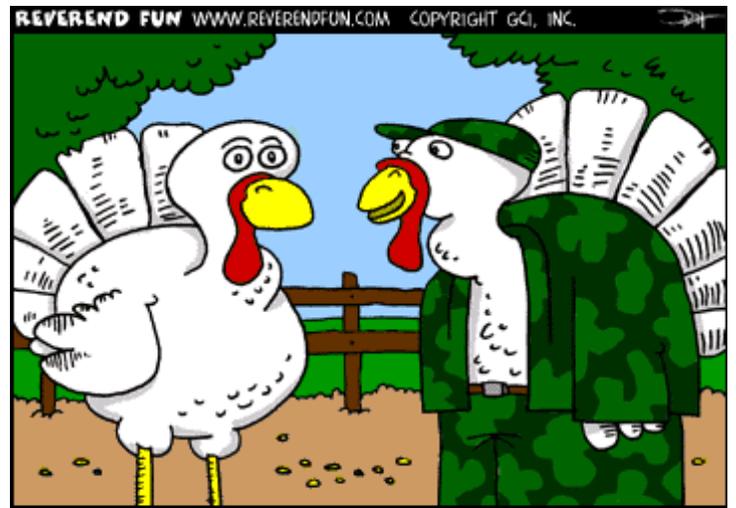
The Newsletter of the Philadelphia Association for Critical Thinking

www.phact.org

November 2006

The goblins and witches are gone until next Halloween and turkeys throughout the land are hiding, but scientists are not. **Physicist Donald Simanek** will be on hand to lead an enlightening discussion of many matters of science and pseudo-science; much of which can be found in his book entitled "Science Askew". At **Philadelphia Community College, 17th and Spring Garden Streets, West Building Room W2-48, Saturday, November 18 at 2 PM.** This PhACT event is hosted by the Physics Department of Philadelphia Community College. Dr. Simanek is Professor Emeritus at Lock Haven University. His web site is at <http://www.lhup.edu/~dsimanek/home.htm>. There is a lot of interesting and fun information there and it gives a taste of what to expect at the meeting. The event is free and open to the public. Bring a friend and the desire to learn.

The PhACT Winter Solstice Party will be on Friday, December 22, 2006. This event is free but is for members only and their guests. Contact Eric Krieg for details.



FOR THANKSGIVING THIS YEAR I AM THANKFUL
FOR MY NEW CAMOUFLAGE GEAR

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Phactum is, in theory, printed 6 times a year and is the main propaganda organ for the Philadelphia Association for Critical Thinking.

If you are not a subscriber we invite you to become one by sending \$15 for a one year membership to PhACT, \$10 for students.

Send letters of rebuttal, ideas, short essays, poetry, opinion pieces, complaints, and lavish praise to Ray Haupt, Phactum editor, at phactpublicity@aol.com.

PHACT CALENDAR

Saturday, November 18, 2006 - The Physics Department of Community College of Philadelphia will host a meeting of PhACT - at 2:00 PM, Community College of Philadelphia, 17th and Spring Garden Streets, West Building Room W2-48.

Dr. Donald Simanek, Emeritus Prof. of Physics, Lock Haven University, will talk on **SCIENCE ASKEW**. Gems of science humor, satire and parody from his book of the same title by Donald E. Simanek and John C. Holden. Possible topics: The age of the universe is a function of time, The illustrated dictionary of physics, The Ideal Scientific Equipment Company, The Hazards of Solar Power, A Religion for the Rest of Us. There may not be time for all these topics but a lot of information will be discussed.

This meeting is free and open to the public. Bring a friend. Executive meetings are held prior to each lecture at 1:00 PM. Any member may attend. Light refreshments will be served.

Friday, December 22, 2006 - annual Wtinter Solstice party - email Eric: at erickrieg@verizon.net for details and directions. This event is free but is strictly for members and their guests only.

Saturday, January 20, 2007 - ACLU chapter board member Bill Ewing will speak on issues of free speech.

Saturday, February 17, 2007 - Princeton University Professor Tom Delworth, a geophysicist, will speak on Global Warming.

Tuesday, November 14, 2006 - 6:30 TO 8:30 pm **Lecture: A Conversation on Darwin, Science, and Religion in the 21st Century**. At the Academy of Natural Sciences. 19th Street and the Benjamin Franklin Parkway in Center City Philadelphia. This is a free event. See page 5 for more information.

Wednesday, November 15, 2006 - 5:30 to 7:00 PM **Lecture: Discovering the Link Between Fish and Land Animals: The Story of *Tiktaalik roseae***. At the Wagner Free Institute of Science. 17th and Montgomery Avenue in Philadelphia, near Temple University. This is a free event. See page 6 for more information.

Wednesday, December 6, 2006 - **Metanexus Lecture Series**. Georgetown theologian John Haught, 2006-07 Metanexus Fellow, will give a series of thought-provoking talks entitled Science and Christian Faith beginning December 6 and continuing into 2007. The five-part series will take place at Bryn Mawr Presbyterian Church, co-sponsor of the events with Metanexus Institute. The talks will begin at 7:30 pm and are free and open to the public. Sessions will include respondents from other religious traditions and will offer opportunities for the audience to participate in the dialogue. A prominent theologian, Haught specializes in systematic theology, with a particular interest in issues pertaining to science, cosmology, ecology, and religion. Bryn Mawr Presbyterian Church is located at 625 Montgomery Avenue in Bryn Mawr, PA, 610-525-2821. For further information about the series, please contact Julia Loving at 215.789.2200, ext. 107 or loving@metanexus.net. **Until December 31, 2006: Special Darwin exhibit at The Franklin Institute of Science**, at 20th and Benjamin Franklin Parkway in Philadelphia. For more details: <http://www2.fi.edu/exhibits/traveling/darwin.php>

Ongoing: The Philadelphia Paranormal Research & Investigative Group. Seeking evidence of the existence of

ghosts and spirits. 2nd Sunday each month at 6 PM. Essene Café & Market. 719 South Fourth Street, Philadelphia. More info: Richard Longo 215-200-5245, <http://ghosts.meetup.com/87/>.

Ongoing: Freethought Society of Greater Philadelphia (FSGP) and the Humanist Association of Greater Philadelphia (HAGP) co-sponsor a monthly book discussion club. The book club meets on the third Saturday of each month at 7:00 PM at Willow Grove Barnes & Noble, 102 Park Avenue, Willow Grove, Pennsylvania 19090. If you have any questions, please contact the book club moderator, Ian Thomas. Email: ian.thomas101@gmail.com Phone: (610) 368-5915 Cell: (610) 565-4530.

Ongoing: Penn Science Café is a lecture series hosted by PhACT member Greg Lester. Scientists and engineers from University of Pennsylvania discuss their work at a level accessible to the layman. Events are on the last Monday of each month at 6:00 PM at the MarBar, 40th & Walnut Streets. Lectures are free and open to the public.

Ongoing: The Wagner Free Institute of Science offers an assortment of science lectures presented at the introductory college level by professors from various universities around Philadelphia. These courses are free and vary from a single night to an eight week course. See their website at <http://www.wagnerfreeinstitute.org/>.

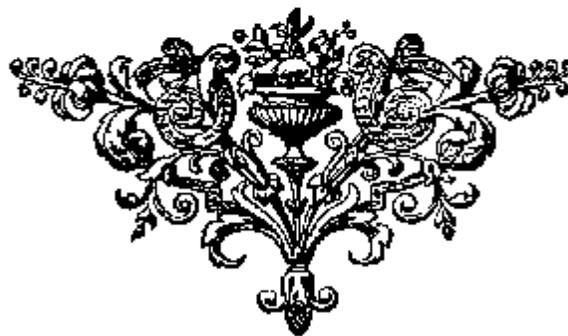
The PhACT Calendar is open to members, and non-members too, who wish to announce meetings and events of other groups of which they are interested or affiliated. These events should be of some general interest to the Skeptical or Scientific community and should be within a reasonable radius of Philadelphia. Send submissions to the editor at phactpublicity@aol.com. Keep the announcements brief. Space is limited and insertions will be made on a first come-first served basis after the needs of PhACT are accomplished.

Science Askew

By Donald Simanek and John Holden

An Almanac of Scientific Ephemera.

Being a light-hearted look at *SCIENCE*, a compendium of levity on *MATTERS OF GRAVITY*, an investigation into the murky realms of the dusty laboratories and minds of scientists in all fields of the *NATURAL SCIENCES* (and *MATHEMATICS*, too), compiled for the edification of diverse and sundry addicts of the absurd, aficionados of the abstruse and connoisseurs of the contrived, being soundly based upon the work of *INGENIOUS* investigators of the *MYSTERIES* of *NATURE* in many considerable parts of the *WORLD*, & including digressions into philosophic and religion to boot. These essays are designed to be infructive and illuminating as well as entertaining, suitable for any student with an *INQUIRING MIND*, impatient with staid and stuffy research investigations reported in scientific journals.



Institute of Physics Publishing, Bristol and Philadelphia, MMII

Science Askew by Donald Simanek and J. C. Holden

Hardcover: 352 pages Publisher: Institute of Physics Publishing (December 2001) ISBN: 0750307145

Review

If harmless humour ... makes you laugh, then you'll love this book by retired scientists Donald Simanek and John Holden. Their collection of nursery rhymes turned into turgid scientific prose is found amidst an array of puns, stories, jokes, and quotes that the authors have brought together after a lifetime in science to show that it is not always a serious business.

-Matin Durrani, Physics World

Science Askew is a very funny book, especially to mathematicians and physicists. Open it anywhere and you'll find some belly laughs not only in the text but also in the clever cartoons by John Holden. All of the classic jokes are here, as well as a thousand more you haven't heard before.

-Martin Gardner, mathemagician

Simanek and Holden have cleverly disguised this book as an anthology of humor, while inserting gems of scientific wisdom and philosophy among the jibes. I think that science teachers can discover here subtle ways of teaching facts and principles, and improving the flavour and aroma of otherwise dull rules and discoveries. Knowledge, however lubricated or polished, is a commodity we should pursue. It need not be boring; proof of that assertion is found in Science Askew.

-James Randi, investigator of paranormal claims

Every page is a delightful spoof. I expect to refer to it frequently.

-James A. Van Allen, space physicist

Various Ruminations

Collected/written by Ray Haupt, editor

Ghosts in the attic

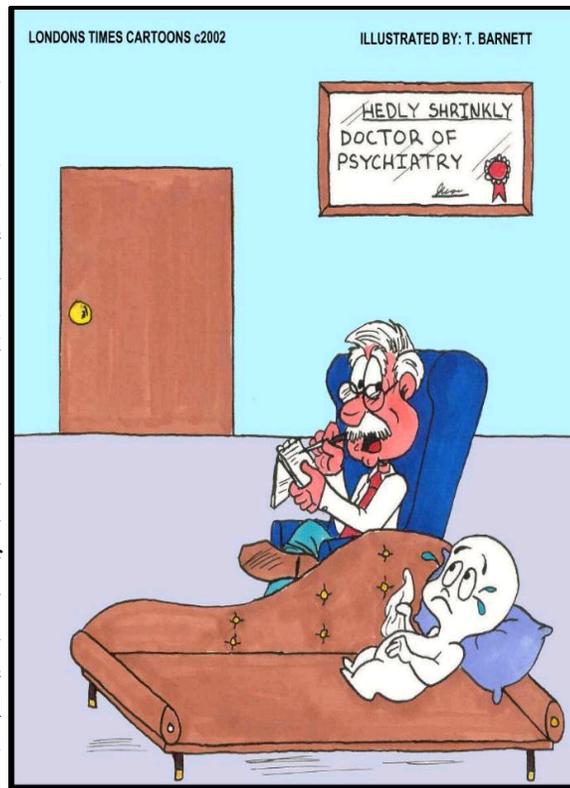
Halloween ghosts have disappeared but other spirits seem to ignore calendars and appear to be with us, at least in a large portion of public belief. On October 31 our vice-president, Bob Glickman, was the spokesman for sanity on Comcast broadcast, the Arthur Fennell Show, which airs at 10 PM. The topic was ghosts. The interviewer, Jam Sardar interviewed Bob and a woman who is a ghost tour guide in Center City Philadelphia. It was an entertaining segment and was fair to each side although the side for sanity, our side, did seem to have a

little less time. Bob did well however, and at the end, the interviewer, Jam Sardar, when himself questioned about his ghostly beliefs announced that as a journalist he tries to keep an open mind but he does fess up to being skeptical. Thank you Jam Sardar and Arthur Fennell.

Meanwhile, back at the haunted mansion, theoretical physicist Costas Efthimiou, a professor at the University of Central Florida, in an Associated Press article (Philadelphia Inquirer Friday, October 27, 2006, <http://www.philly.com/mlt/philly/news/nation/15858895.htm>) discussed Americans' gullibility for the supernatural. Professor Efthimon uses mathematics and physics to disprove ghostly contentions. Zombies and vampires also do poorly. He is joined by Dr.

Robert Park, a physics professor at University of Maryland, in anti-ghost opinion based on science, although both will give candy to smaller spirits with a sweet tooth on Halloween Night. Dr. Park was a PhACT speaker several years ago.

So it appears that Bob Glickman is keeping good company indeed.



YOU KNOW, THIS MAY BE MORE OF A SPIRITUAL
ISSUE THAN A PSYCHIATRIC ONE.

A Conversation on Darwin, Science, and Religion in the 21st Century

November 14, 2006 6:30 p.m. – 8:30 p.m.
Academy of Natural Sciences, at the corner of 19th Street and the Benjamin Franklin Parkway
Free event.

Two of Metanexus Institute's most esteemed colleagues, William Grassie and Peter Dodson, are panelists for a public program given as part of the Town Square series of the Academy of Natural Sciences. The lively panel discussion is presented in conjunction with



Oh Look at that ... Noah's Invite has an RSVP

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the Darwin exhibit now on display at the Franklin Institute. Grassie and Dodson will be joined by Colin Purrington, associate professor of biology at Swarthmore College.

Some of the questions that will engage the panel and the audience throughout the evening are: How do scientists accept and promote evolutionary theory in the face of religious objections? How does their own religious faith (or lack of faith) affect their work? Where is the common ground between religion and evolution?

Dr. William Grassie is the founder of the Metanexus Institute and executive editor of the Institute's online magazine and discussion forum with over 40,000 weekly page views and over 7000 regular subscribers in 57 countries. He has taught in a variety of positions at Temple University, Swarthmore College and the University of Pennsylvania.

Dr. Peter Dodson holds three degrees in earth sciences. He has spent his entire career as a gross anatomist at the University of Pennsylvania School of Veterinary Medicine, with a secondary appointment in

the Dept. of Geology. He is also a research associate at the Academy of Natural Sciences of Philadelphia. He has done extensive fieldwork in the western United States and Canada. In 1981 he discovered a new horned dinosaur in Montana, which he described as *Avaceratops lammersi* in 1986. Since 1995 he has visited China (twice) and India, and has participated in field projects in Madagascar, Egypt and Argentina. Less exotic but also rewarding has been a field site in Montana that has recently yielded a new sauropod dinosaur.

Dr. Colin Purrington is a professor of evolutionary biology at Swarthmore College and was a past speaker at a PhACT lecture two years ago; his topic at that time being the Creation/Evolution question as it effects the public schools. Dr. Purrington is an outspoken critic of Intelligent Design and the movement that propels it. He is a strong proponent of teaching evolution in public schools.

For further information about this event please contact Julia Loving at 215/789-2200.

If the Metanexus event interests you then go a step further and chomp onto this next juicy morsel, but be Thankful this Thanksgiving season that he will not be chomping on YOU. Tiktaalik is one nasty looking dude!

Discovering the Link Between Fish and Land

Animals: The Story of *Tiktaalik roseae*

Wednesday, November 15, 2006 5:00 - 7:00
PM Lecture at 5:30 PM Free event. At the Wagner Free Institute of Science.

Dr. Ted Daeschler will provide an insider's look at his fieldwork and studies on Late Devonian fossils (385-365 million years old) from the Canadian Arctic. He and his colleagues have recently discovered and described a new species, *Tiktaalik roseae*, widely recognized as the evolutionary transition between lobe-finned fishes and the earliest limbed vertebrates. In his lecture, Dr. Daeschler will describe why and how they



chose to explore in the remote and inhospitable terrain of the Canadian Arctic for these kinds of fossils. He will also describe and illustrate the features of *Tiktaalik* that make it an important piece of evidence in learning about the nature

of the evolutionary process and the history of life on earth.

1700 West Montgomery Avenue, Philadelphia, PA 19121, near the Temple University Campus.

And speaking of the **Wagner Free Institute of Science**, check out their website and list of courses. All are free but some do require pre-registration. Don't miss out for not having registered.

<http://www.wagnerfreeinstitute.org/>

And if Tiktaalik is not enough, then get a load of this: Japanese researchers announced that a bottlenose dolphin, captured by fisherman off the western coast of Japan, has an extra set of fins that could be the remains of back legs. Fossil remains indicate that dolphins and whales were four-footed land animals about 50 million years ago and share a common ancestors with the hippopotamus and deer. Scientists believe they later transitioned to an aquatic lifestyle and lost their hind limbs. Whale and dolphin fetuses show signs of hind protrusions but they disappear before birth. A freak mutation may have caused the ancient trait to reassert itself. In some ways this discovery is even more satisfying than Tiktaalik. At least he is alive and well and swimming in a tank at the Taiji Whaling Museum near Tokyo.

Dinosaur Extinction questioned

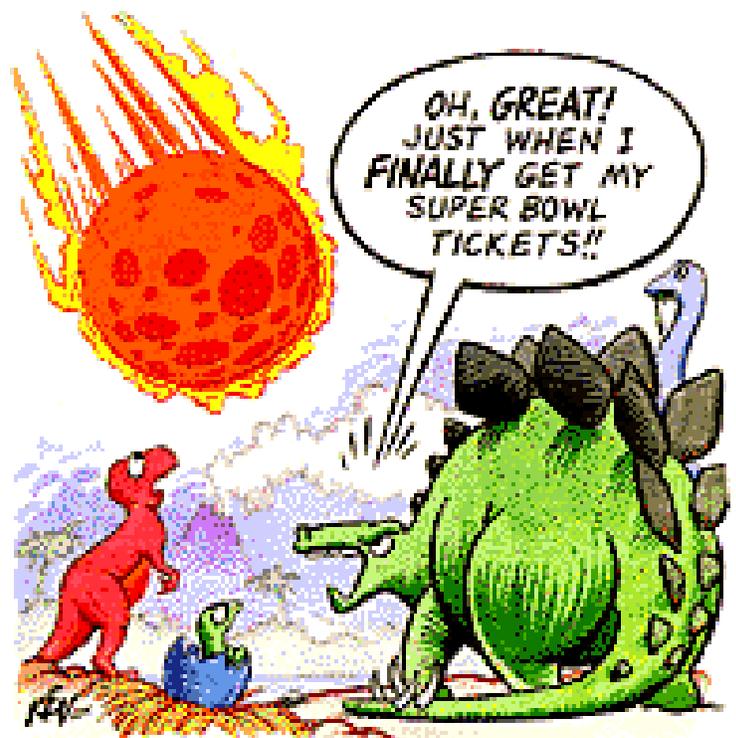
The Philadelphia Inquirer, October 25, 2006, reports that Princeton University scientist Gerta Keller thinks that the Chicxulub meteor impact theory of dinosaur extinction 65 million years ago is wrong. Dr. Keller bases her theory partially on the facts that she and her team have discovered debris deposits from the impact in Texas and in Mexico that pre-date dinosaur extinction by about 300,000 years. Keller also has found fossils of microorganisms above and below the meteor debris. In those samples thousands of fossils will be found and no evidence of extinction or significant abundance change is observed. Dr Keller concludes that dinosaur extinction is more likely due to other meteor and volcanic activity.

Dr. Keller's theory is at odds with the opinions of most scientists in that field, but it does appear that she has strong evidence to back up her contention that the Chicxulub meteor was not the cause of dinosaur demise. Scientists will no doubt be fighting about this issue for many years to come, similar to the debates about Continental Drift. Could it be, however, that meteors had no part whatever in the extinction?

Perhaps the next big meteor will help answer those questions.

See the article at: <http://www.philly.com/mld/philly/living/health/15840611.htm>.

Politics: The October 7th issue of 'New Scientist' Magazine reported that Scientists and Engineers for America (SEA) are actively promoting the election of a president who is more receptive to science. The SEA's advisory board includes two of Clinton's former science advisers - John Gibbons and Neal Lane-- plus eight Nobel laureates. In the November 4th issue, the magazine published an interview with Tony Blair, Prime Minister of the UK. and quoted him as stating "I



was very poor at science at school. It's only as a political leader that I've really taken to the importance of science to the country's future." Since 1997, when Blair became prime minister the UK governments' annual spending on science has risen from 1.3 billions (pounds) to 3.4 billion (pounds).

Errata

In the October 2006 Phactum we reported that Eric Krieg offers a \$50,000 prize to anyone who can prove a paranormal claim. That should have been reported as a \$10,000 prize. Also, Eric Hamell's name was incorrectly spelled as "Hamil". Apologies to both Erics.

"Heavier-than-air flying machines are impossible."

(1895) - Lord Kelvin

Quantum theories, Randell Mills and Willie Wong

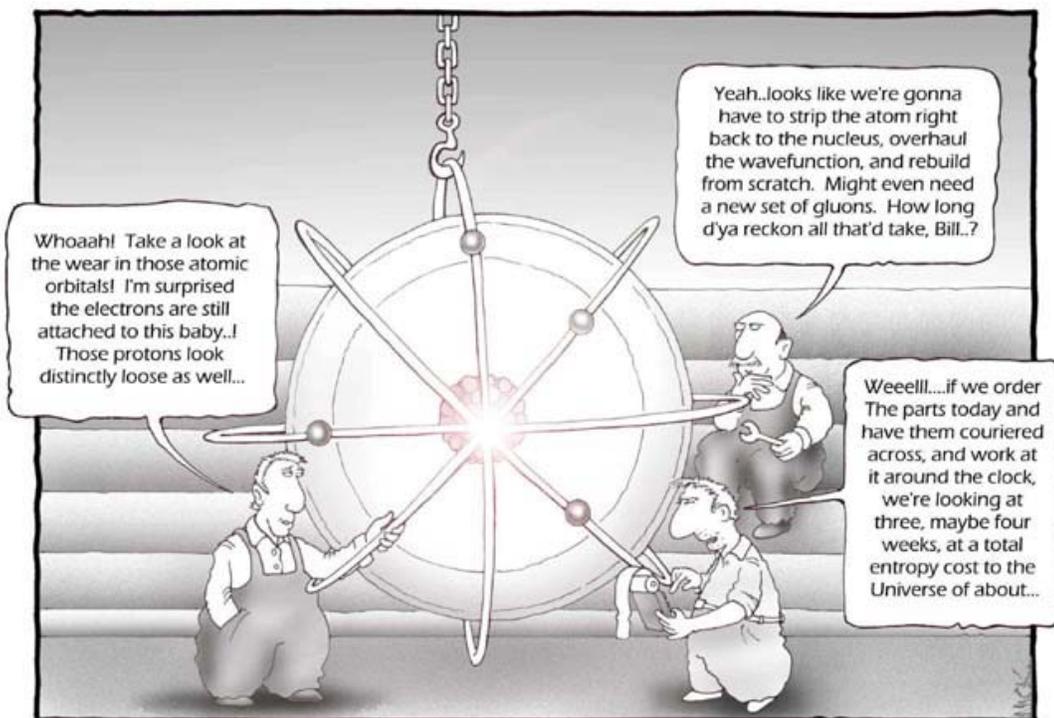
by Tom Napier

On Saturday, 16th September, Princeton University graduate math student, Willie Wong, talked to a crowded PhACT meeting about some mathematical aspects of the novel quantum theory developed by Randell Mills.

At the risk of sounding like Yogi Berra, I must say that novel quantum theories are nothing new. Standard quantum theory is infuriating. On the plus side, it accurately predicts, for any measurement one can make, the probability of each possible outcome. On the minus side, it never tells what will happen, only what might happen. It says nothing about what goes on between measurements and, worse still, it claims that no alternative theory can reveal more information. This has all been fully confirmed by experiment. There are several different physical interpretations of quantum theory but, when expressed in mathematical form, they give identical results. No experimental test can determine which is more correct.

Generations of more or less qualified physicists have found this state of affairs intolerable and have developed their own theories to predict how particles ought to interact. Particles don't read theories on the Internet, they just go about their business of being particles. The job of physics is to produce the best and most compact description of how particles behave. This gives us insight into how they will behave in some future situation. Proposing a new theory doesn't change how particles behave, it merely creates an incorrect theory. As late PhACT member, Milton Rothman, wrote in "Discovering the Natural Laws. (1972)": *"We must always remember that human beings cannot push nature around. We cannot make things do what is forbidden. All we can do is arrange objects so that, when they do what they have to do, the results are useful for our purposes."*

Randell Mills, MD, like many predecessors, has published a quantum theory based on classical physics. Mills believes this theory reveals a previously unsuspected way to supply low-cost energy. He has founded a company, BlackLight Power, Inc, (www.blacklightpower.com) and raised millions of dollars to develop this energy source.



Quantum mechanics.

Physicists and mathematicians have examined Mills' theory and, for the most part, say it doesn't make sense. Willie Wong focussed on a narrow aspect of Mills' theory so here I'd like to start by filling in some of the background of quantum theory.

Last year we celebrated the centenary of Albert Einstein's Anno Mirabilis in which he published three papers that totally changed physics. Of these his formulation of Special Relativity is best known but it was his Nobel Prize-winning analysis of photoelectricity that has had the greatest practical impact

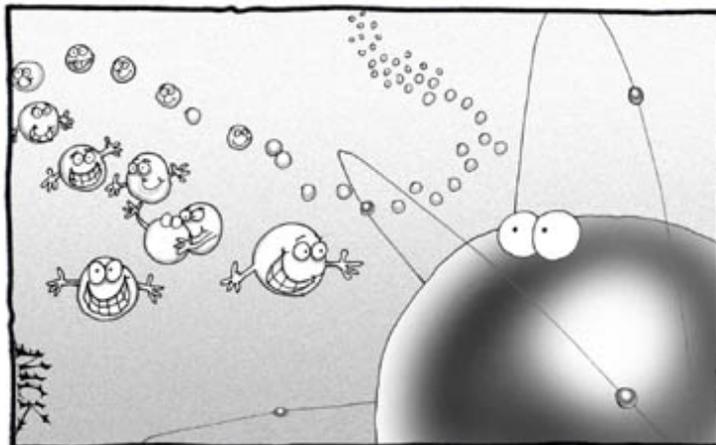
Five years earlier, in 1900, Max Planck suggested that the spectrum of the light emitted by heated matter, the red glow from hot iron for example, could be

In 1903 Orville Wright flew a heavier-than-air flying machine.

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Neutriyeses, n.

Affectionate particles produced when neutrinos are passed through an underground tank of beer. Unlike the neutrino, the neutriyees can be identified by its indiscriminate attraction to almost any available atom.



explained by supposing that light of a given wavelength is not emitted in infinitely divisible amounts but in discrete lumps he called quanta. The appropriate energy unit for a given wavelength can be derived by multiplying what we now call Planck's Constant by the frequency of the light. Einstein's 1905 paper confirmed Max Planck's hypothesis. Thus we now take 1900 as the watershed year between classical or Newtonian physics and the quantum physics that superseded it.

Quantum theory's first big success was its theoretical explanation of the light emitted by hot or electrically excited gases. The spectrum of, for example, a neon sign, contains many narrow colored lines. Back in 1885, J. J. Balmer derived an equation that expressed the frequency of each line in terms of two small integers. No one knew what this implied until Niels Bohr applied quantum theory to the electrons in an atom.

In the classical picture an electron circling a positively charged nucleus would radiate energy and spiral into it. If the energy of an electron is quantized there is a minimum amount of energy it can lose. Even in its lowest energy state, the "ground state," it is still some distance from the nucleus. This explains why matter exists and is stable. The great majority of atoms are in their respective ground states. If a lower-energy state existed, electrons could fall into it and emit light. (We would then call that state the "ground-state.")

The finite value of Planck's Constant means that, as an electron's energy increases, only certain orbits are possible. When an electron jumps from a higher orbit to a lower one it loses energy by emitting a quantum of light. If the orbits are numbered in order of increasing energy, the frequency of the light emitted is exactly that given by Balmer's empirical formula. The two arbitrary numbers in Balmer's equation turned out to be the starting and ending orbit numbers.

The early quantum theorists were trained in classical physics and thought of electrons as tiny objects having charge and mass. Surprisingly, this approach gave satisfactory results, once the quantization of energy was taken into account. Heisenberg's more sophisticated view says that, as we cannot measure both the position and the velocity of an electron, it is naive to think of it as a point object having a definite location. Today we use the same equations but view electrons as fuzzy lumps that collectively define the size of an atom.

In a way, quantum theory raises more questions than it answers. A long-standing puzzle of classical physics was whether light was a particle or a wave. Experiments could be done to demonstrate either. Quantum theory counter-intuitively says it is both. Einstein thought his hypothetical Einstein-Podolsky-Rosen experiment showed that quantum theory was incomplete, that particles had hidden attributes that told them what to do. Theoretical work by John Bell in 1963 and experiments by Alain Aspect in 1981 ruled out such "hidden variables." Even when it seems illogical, quantum theory predicts exactly what happens.

This has prompted a backlash from a noisy minority who'd like nature to be described by neat deterministic, non-relativistic (classical) laws. They suppose that if they can't understand something, it can't possibly be correct. They compose dubious theories, write irate letters to science journals and keep the vanity presses in business.

Randell Mills has not only reinvented quantum theory but, according to his book, *The Grand Unified Theory of Classical Quantum*

"There is nothing new to be discovered in physics now. All that remains is more and more precise measurement."
1900) Lord Kelvin

Mechanics, he has solved all the outstanding problems in cosmology. In his theory, the quantum numbers of the orbits in a hydrogen atom don't just range from 1 to infinity, they can also take fractional values. As Mill's Web site says, "The BlackLight Process allows the electron to move closer to the proton . . . below the prior-known ground state." Mills calls a hydrogen atom in this lower state a "hydrino." Turning hydrogen atoms into hydrinos should release many times more energy than, for example, combining the same hydrogen with oxygen. This will supply all our power needs for the foreseeable future. Mills also promises a range of hydrino-based chemicals. This combination of cheap energy and new chemistry has excited venture capitalists. Mills' company is alleged to have been founded with \$50m capital. It has been in business for some ten years but has yet to unveil a working product.

Willie Wong summarized years of "free energy" schemes and mentioned that, unlike many such, Mills' idea doesn't infringe the conservation of energy. Mills, having an MD and a year's graduate work in electrical engineering at M.I.T., is better qualified than the run-of-the-mill [no pun intended] free energy promoter.

Mills claims that quantum theory is not compatible with relativity. This would come as a great surprise to P. A. M. Dirac who incorporated relativity into quantum theory in 1930. Dirac predicted the positron and showed how the spin and magnetic moment of an electron explained the splitting of spectral lines. His version of quantum theory not only accounts for all observed phenomena, it gives results of an accuracy unmatched in classical physics.

Mills' explanation of the non-radiating electron supposes that an electron in an atom spreads out into a thin spherical shell around the nucleus. Mills' only physical justification for the electron's being confined to a shell seems to be that this prevents it from radiating, a circular argument if there ever was one. Oddly, a classical moving-point electron confined to a shell would radiate. However, Mills is now able to write a three-dimensional (two space, one time) wave equation replacing the four-dimensional one normally used.

Much of Wong's presentation analyzed Mills' equation. Apparently it is not hard to understand, if you are a graduate math student, but one must take great care when deriving further results from it. Wong showed that Mill's spherical distribution was only one of many charge distributions compatible with non-radiation, provided the electron is treated as a charge distribution rather than as a classical point object.

Both Mills and quantum theory predict the observed spectrum of hydrogen; if they didn't agree we'd have clear evidence that Mills was wrong. However, Mills theory demands the existence of additional energy levels below the ground state. Somehow hydrogen atoms avoid falling into this state naturally but can be induced to do so by Mills' catalytic process. This causes the emission of UV radiation, hence the name of Mills' company.

No "BlackLight Process" can allow an atom to do anything not permitted by the laws of nature. Wong admits that even conventional quantum theory might hold surprises hidden among the many terms that are usually ignored as being negligible. Only experiment will reveal whether changes are needed to match theory to reality. So far quantum theory has a pretty good record and it doesn't permit hydrinos. If hydrinos could exist we'd surely find them all around us.

Tom Napier is a physicist and long time member of PhACT and Mensa. He claims that he did once sit through a university-level course in quantum theory, mostly in an awake state we trust.

Ω Ω Ω

Michael Shermer tells us "Why Darwin is important" By Eric Krieg

On Friday the 13th of October, PhACT was proud to host a lecture by leading international skeptic, Mike Shermer, at the Ethical Society on Rittenhouse Square. The local Free Thought society had lined him up for a book signing for their following anti-superstition bash and were nice enough to allow us to extend the venue with an early lecture.

I felt honored to do a quick plug for PhACT and introduce Shermer to the standing room only audience. Michael, who was on a nationwide book promotion tour disappointed no one with his unique fast pace of promoting science and reason. Shermer is a renowned science writer and founder of the international Skeptics Society. He seems to possess the same focus and energy as when he used to bicycle race across America in under 11

In 1905 Albert Einstein creates the Special Theory of Relativity.

days. He did some reading from his excellent new book he's promoting, "Why Darwin Matters" He talked about his and Darwin's excursions to the Galapagos Island chain. Many people weren't aware that Darwin likely delayed and limited promotion of his ideas out of concern for his own and his family's religion.

Shermer doesn't just limit himself to the general skeptical position on evolution . . . explaining it and deflating creationist attacks. He covers deeper topics like how evolution is part of greater effect where emergent order can arise from random processes (like a free market economy). He proposes a means where religionists can embrace evolution without necessarily having to give up religion. This is a pragmatic response to the nearly half of our countrymen who presently reject evolution and are unlikely to question sacrosanct religious beliefs and culture.

The Q & A portion at the end raised many questions were along the line of "How do we make them believe?" Shermer reminded us that it is not enough to be against something - we have to be for something . . .

science, reason, understanding, solving mysteries, advancing the cause of humanity. To do that, we must avoid the temptation to paint peoples' most valued beliefs as "silly superstitions". "If we take such an adversarial approach, we lock ourselves out before we ever even start a dialogue." He recommend offering more sound-bite friendly statements that easily fit on a t-shirt or bumper stickers, because as he puts it, "there is nothing brief about books like Stephen Hawking's 'A Brief History of Time'". Shermer took on fears of evolution that lead close to half of our population to reject it. There is a common but seldom voiced deep fear in the minds of masses to the effect of "if the masses didn't have religious convictions - the remaining unfettered animal nature would lead to social destruction." Shermer noted that "if people really did not have any moral values without religion, then the least religious people of all—the scientific community should be out running amuck, committing senseless

crimes." Though the general audience loved this sarcastic syllogism I did hear an interesting response from one young student who attended, "Most members of the freethinking scientific community were at one time religious and have already voluntary or involuntary had moral values instilled in their minds. "

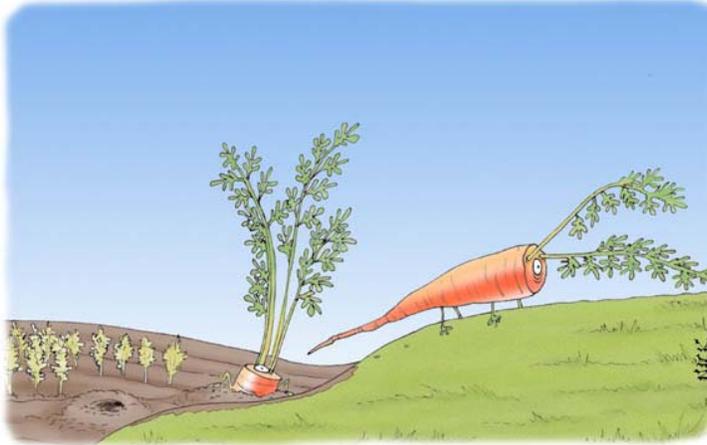
Shermer went on to explain how a good bit of negative human behavior is an atavistic result of millennia of evolution supporting characteristics like hoarding, putting on excess weight, slaughtering competing groups and philandering. Even people's natural difficulty grasping the infinitesimal, eons of time, or the vastness of space would be explained from our tens of thousands of years developing as simple tribal people having no need for such visualizations. Some have posited the deep irony that proclivity for religious belief could its self have evolutionary advantage. But, he went to describe the utility of evolution explaining emergent properties like market economies or altruism.

As someone sharing Shermer's fundamentalist roots in teenage years, I found it fascinating when Shermer talked about how it should be possible to pitch evolution to the fundamentalist Christians (the only religion to really reject

evolution). The nascent science of "Evolutionary psychology" offers great support for the fundamentalist tenet, "we are born with a sinful nature".

Shermer reaching out to believers offers that he doesn't claim to know how the universe sprung into being and that aspects of it are truly inspirational and wondrous. He challenges that a God capable of a single creation/intervention that would then use only fixed physical laws to give rise to us would be way more powerful than a God having to resort to a long string of interfering miracles along a shorter path. In further declaring no necessity for a fight between religion and science, Shermer explains that science has shown us that all of creation is far longer, far greater and far more infinitesimal, and far more complex than any original deity promoter dreamed of.

You can find out more about Michael Shermer's Skeptic Society



The next great step in carrot evolution.

When he died in 1907, Lord Kelvin was buried next to Sir Isaac Newton in Westminster Abbey.

at: <http://skeptic.com/> or his accomplishments as a long distance bike racer at: http://www.ultracycling.com/about/hof_shermer.html.

Post script: After Shermer's talk, we went upstairs for the Freethought Society's 'Anti-superstition' party. People of all ages danced to superstition-themed music such as Black Magic Woman (Santana), Superstition (Stevie Wonder), Bad Luck (Harold Melvin & the Blue Notes), It's Raining Men (Disco!), Short People (Randy Neuman), and Spooky (?), Along with dancing (some of us with open umbrellas!) there was information on superstitions. Everything from rats, eggs, lucky pennies, beans, broken mirrors to Voodoo and more was covered in this educational party. The more agile in the group (including Michael Shermer and Margaret Downey) limbo danced under an open ladder, the less agile of us watched !

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Down With Smoke, Up With Nudity!

By Harriet Hall, MD

Smoking is one of those emotion-laden subjects like abortion and global warming, where it's hard look at the evidence without bias. Albert Conner's "Science Without Sense – The Case of Secondhand Smoke" [Phactum, October 2006] is far from an even-handed analysis of the science. In fact, it's so misleading that it almost sounds like propaganda from the tobacco industry.

In 1989 the EPA published a risk assessment of second-hand smoke and labeled it a Group A human carcinogen. Conner tells us that this "egregious statistical fraud" was challenged by the tobacco industry and was struck down by the U.S. District Court in North Carolina. What he does *not* tell us is that in 2002 the US Court of Appeals for the Fourth Circuit vacated the judgment of the lower court. And even if the lower court's ruling had not been overturned, it wouldn't have meant that second-hand smoke is *not* a Group A carcinogen. And the court didn't even address any of the many other harms and diseases resulting from exposure to smoke. Today, second-hand smoke is still classified as a known carcinogen by the EPA, and the EPA website states that there is no evidence of a threshold below which it will not cause cancer. The tobacco industry's objections to the EPA report are adequately rebutted at:

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(See Genesis 3)

GADZOOKS ... WE'RE NAKED!

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<http://www.epa.gov/smokefree/pubs/strsfs.html#classification%20of%20secondhand%20smoke%20as%20a%20known%20human%20carcinogen>.

Conner dismisses retrospective epidemiological studies, saying they are not science. Yet he's quite willing to cite those studies as evidence when they support his own thesis. (Of course he doesn't discuss the serious design flaws that have led critics to reject some of those supporting studies).

True, correlation doesn't prove causation. But in the case of second-hand smoke, epidemiologic studies don't just show a simple correlation – they show a dose effect (increasing effect with increasing exposure), and they are supported by animal and lab studies that provide plausible mechanisms. The combined evidence is more than enough to convict second-hand smoke in a scientific courtroom. What more evidence would Mr. Conner ask for? We can't fulfill Koch's postulates using human guinea pigs.

Conner says estimates of second-hand smoke exposure are subjective and inaccurate, but he doesn't tell us about the many studies that have quantified second-hand smoke exposure by measuring urine cotinine levels. Yes, you can tell whether the nanny smokes by finding a nicotine derivative in your baby's pee, and the level will be higher if she smoked in the baby's room than if she smoked in the bathroom.

The evidence just keeps coming, relentless as the Energizer Bunny. The INTERHEART study published in the Lancet in August 2006,



with 27,089 participants in 52 countries, showed that second-hand smoke was associated with a graded increase in risk of heart attack related to exposure; a risk ratio of 1.24 (1.17-1.32) in individuals who were least exposed (1-7 h per week) and 1.62 (1.45-1.81) in people who were most exposed (>21 h per week).

In June 2006, the Surgeon General issued a comprehensive report based on all the scientific studies to date. <http://www.surgeongeneral.gov/library/secondhandsmoke/report/>. Among other conclusions, it said, "Secondhand smoke exposure can cause heart disease and lung cancer in nonsmoking adults and is a known cause of sudden infant death syndrome (SIDS), respiratory problems, ear infections, and asthma attacks in infants and children."

Even the Philip Morris website acknowledges the harm of second-hand smoke.

You can argue till the cows come home about whether we should legislate against public smoking, and you can argue about *how much* smoke does *how much* harm. But to argue that smoke is harmless is either delusional or perverse. Don't we all move to the other side of the campfire when the wind blows the smoke our way? Don't we try to reduce air pollution?

Conner says he thinks the evidence against second-hand smoke is insufficient. I wonder what he would say if we had the same amount of evidence against a new prescription drug. I suspect he would be one of the first to demand it be taken off the market.

Since this subject is so controversial, why not leave science out of it entirely? We have laws against public nudity without any need to show scientific proof of harm; it is sufficient that the majority find public nudity offensive. I find smoke of any kind very unpleasant, and I think that's enough of a reason for people not to force me to breathe it, whether by smoking cigarettes or by building campfires on public sidewalks. I personally would rather eat in a restaurant with naked nonsmokers than with clothed smokers any day.

Harriet Hall is a retired family physician, ex-Air Force flight surgeon, and card-carrying skeptic who writes about medicine as The SkepDoc.

Albert Z. Conner responds

Dr. Harriet Hall's response to my article in the October Phactum is typically that of an anti-smoking zealot who is a true believer in the junkscience



"How was I supposed to know that quitting smoking 638 times in one month was against the law in your town?"

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propaganda generated by the anti-smoking lobby, the pharmaceutical industry, and the Public Health Police. Hall has failed to address the main thesis of the article and instead has merely reiterated the party line of false and misleading information concerning secondhand smoke (SHS). She apparently believes that it is acceptable for special interest groups and public officials to dictate the life styles of the rest of us.

Regarding the SHS issue, I will reiterate a few relevant points:

1. The original EPA designation of SHS as a Class A human carcinogen and a known cause of lung cancer was based SOLELY on a thoroughly discredited meta-analysis of hand-picked epidemiological studies that found an increased risk of cancer of less than 20 percent (Relative Risk factor=1.19). No legitimate epidemiologist or statistician gives any serious consideration to a study that results in a relative risk factor of less than 2-3. The Interheart study fails to meet this fundamental criterion.
2. All subsequent epidemiological studies, whether good, bad, or indifferent, have failed to support the original EPA assessment.
3. The recent Surgeon General's report, by its own admission, introduces no new data but merely compiles the same old meaningless studies. Richard Carmona, the former Surgeon General, has been quoted as stating that "there is no safe level of secondhand smoke". This displays an appalling lack of knowledge of basic toxicology. The amounts of potentially harmful compounds in SHS are orders of magnitude below the

***O Christian Martyr Who for Truth could die
When all about thee Owned the hideous lie!
The world, redeemed from superstition's sway,
Is breathing freer for thy sake today.***

--Words written by John Greenleaf Whittier and inscribed on a monument marking the grave of Rebecca Nurse, one of the condemned "witches" of Salem.

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