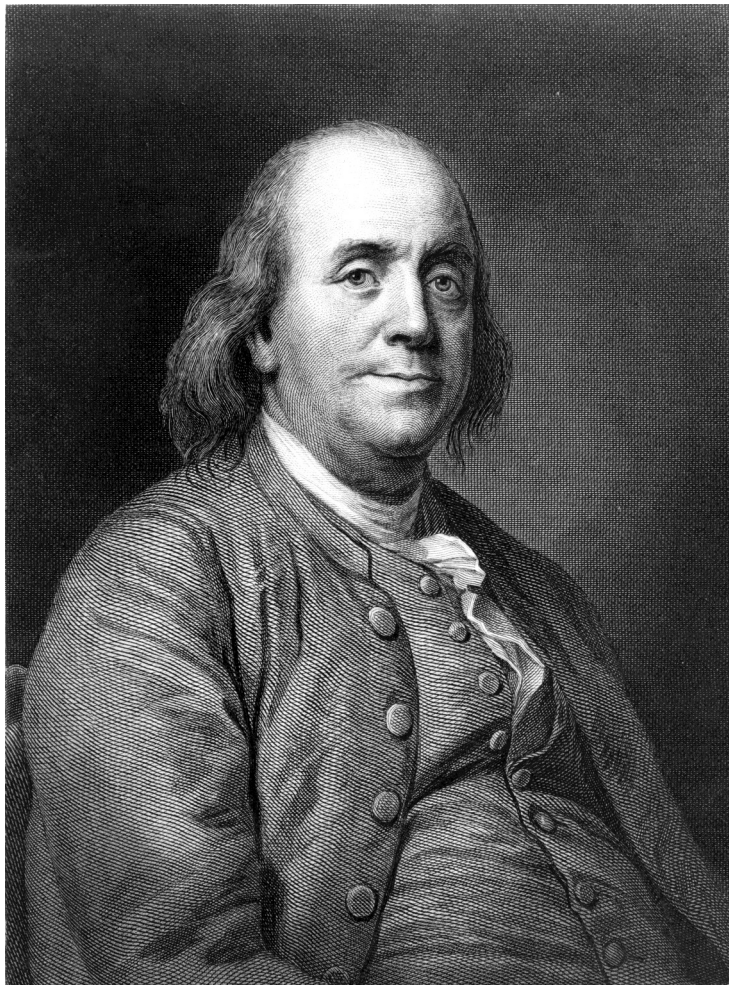


# *Phactum*

The Newsletter and Anti Woo Woo Organ of the  
Philadelphia Association for Critical Thinking  
January/February/March 2015

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**Benjamin Franklin,  
born January 17, 1706**

**Benjamin Franklin**, pictured on the front cover, was born in Boston, January 17, 1706, the 15th of Josiah Franklin's 17 children. Josiah, a soap and candle maker and thus not a rich man, was forced to take Benjamin out of the Latin School at age ten after two years of successful study. At age 17 Benjamin ran away from Boston to Philadelphia where he became a businessman, philosopher, publisher, writer, scientist, politician, and revolutionary. Franklin's contributions to American society are massive and survive to this day. He founded the first insurance company in America, the Free Library, Philadelphia Hospital, American Philosophical Society, and Philadelphia College which eventually became University of Pennsylvania. Not a bad record for someone with but two years of education.



Franklin excelled in matters of mathematics and science having participated in many areas of scientific exploration, perhaps the most famous of which is the Kite & Key Experiment. There is diversity of opinion on this matter but the editor of this publication did go to the pleasant Kite & Key Café just one block away from the PhACT meeting site at Philadelphia Community College. The bar tender, when queried, did confirm that the Kite & Key Experiment was performed on that very spot in 1752. It must, therefore be true.

Franklin was one of five men who drafted the Declaration of Independence. He submitted a plan for Articles of Confederation which was not adopted. Franklin did not sign the eventually enacted Articles of Confederation but he did help draft and then sign the United States Constitution.

It was quite congenial of Franklin to arrange his 309th Birthday to coincide with PhACT's first meeting of 2015. One can only wonder what he would think of the topic of discussion, Free Energy.

## Happy Birthday, Ben!!!!

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### Phactum's Roster of I.R.E. (Infamous Rational Errors)

Phactum contributor Paul Schlueter III has accumulated over time a vocabulary listing of many of the egregious flaws of thinking, devious tactics of argument, and some pretty cool Latin phrases that might sound impressive used at a social gathering.

This listing is nowhere near complete, but has been made into a pamphlet that is available free and only at PhACT Meetings. It is a handy little reference booklet that writers of philosophic and political nature might profitably keep by their typewriter. Meeting attendees are invited to take one and are invited to participate in expanding the listing in the next edition as it is intended to be a collaborative project.

Definitions and examples should be short and to the point and may be submitted to the Phactum editor at:

[phactpublicity@aol.com](mailto:phactpublicity@aol.com)

New entry - **IDENTITY BIAS** - a group of ideas, beliefs, and mores, which serve to distinguish a group's orientation (in time and/or culture), and which members of such groups adopt and propagate as a means of establishing their personal identity and cultural heritage. Frequently, a set of "stances" or "positions" taken on special issues of controversy, generally adopted as "articles of faith." a.k.a., group ideology. (See also: Conservation Bias) (Thanks to Shawn K. Stover, Skeptic Vol. 19, No. 3, p. 55)

# UPCOMING PHACT EVENTS

**Dr. David Cattell, Chairman of the Physics Department of Community College of Philadelphia** hosts meetings of PhACT - at 2:00 PM on the third Saturday of most months at Community College of Philadelphia... Parking is easily available and costs \$4.00 for all day. Enter the college parking lot on 17th Street which is one way south bound. This meeting site is handicap accessible. **PhACT Meetings are Free and open to the public unless otherwise noted.**



Lectures are generally at Community College of Philadelphia in Lecture Room C2-28 in the Center for Business and Industry at the corner of 18th and Callowhill Streets, at 2:00 PM, unless otherwise noted.

**Saturday, January 17, 2015 at 2:00 PM -**

**Lecture**

**Eric Krieg will discuss "The high cost of Free Energy"**

Is it possible there is a free way to run a car or provide free electricity that big oil and power companies don't want us to know about? Take a look at the history of and what real Science tells us of such claims.

**Eric Krieg** is an electrical engineer presently developing high accuracy electrical power instruments for a company serving the power industry. He has investigated claims of over unity, super high mileage and free energy for 20 year and has been quoted by Scientific American, USA Today and Dateline. He is a founding member and former president of PhACT.



"Six years ago you received a complimentary set of steak-knives. You thought they were free, didn't you Jimmy..? Well, NOTHING in this Universe is really free, Jimmy, NOTHING. We want payment for the steak-knives..."

**Saturday, February 21, 2015 at 2:00 PM - Lecture \*\*\***

**Professor Alan Mann will discuss "The Scars of Evolution"**

Evolution results in function, not perfection. A good example is the evolution of human upright posture. We have evolved from four legged ancestors with the ability to move using our rear limbs only, leaving our front limbs free to carry and use objects. But our bipedality has also resulted in numerous problems associated with this evolutionary development, including lower back problems and difficulty in giving birth.

**Alan Mann**, Professor Emeritus, University of Pennsylvania, Ph.D. University of California, Berkeley 1968, currently Professor of Anthropology at Princeton University, is a physical anthropologist whose interests include paleoanthropology and human evolution. He is the author of *Some Paleodemographic Aspects of the South African Australopithecines* and is the co-author (with Mark L. Weiss) of *Human Biology and Behavior: An Anthropological Perspective*. Professor Mann is also affiliated with Evolution at Princeton. Professor Mann teaches courses on human adaptation and evolution and a summer field course on modern human origins in France.

**\*\*\* Note: This lecture will take place in Room W2-\$47 in the West Building on the southwest corner of 17th & Spring Garden Streets.**

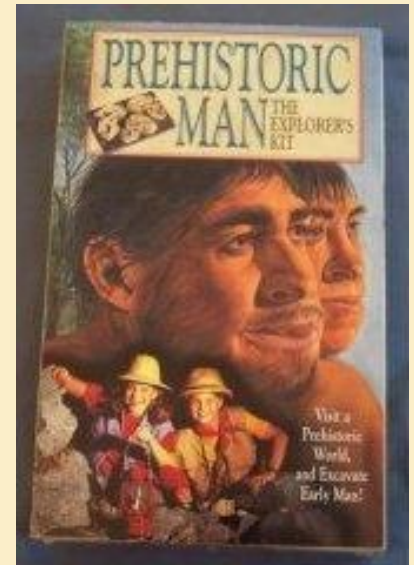
(Continued on page 4)

## Prehistoric Man, the Explorer's Kit: Visit a Prehistoric World and Excavate Early Man!

by Alan E. Mann

Running Press Book Publishers, 1997 - Juvenile Nonfiction  
64 pages ISBN 076240048X, 9780762400485

Imagine the earth 4 million years ago. What kind of plant and animal life covered the earth? What did our ancestors look like? This fascinating kit explores humankind's evolutionary process from the earliest prehuman (Australopithecus) to our modern form. Learn about major fossil discoveries and how anthropologists and archaeologists use these finds to understand ancient



## Human Biology and Behavior:

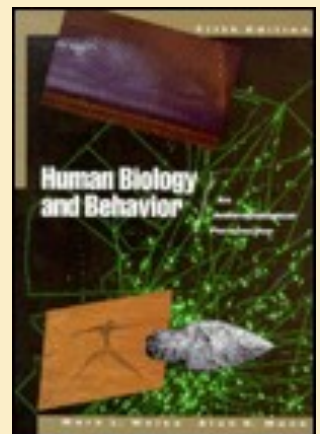
### An Anthropological Perspective, 5th Edition

by Mark L. Weiss & Alan E. Mann

Scott, Foresman, 1997 - - 678 pages

ISBN 0673398803, 9780673398802

This text emphasizes the two major themes of adaptation and evolution and their interrelationships with successful behavior, and offers authoritative coverage of molecular genetics, evolutionary theory, primate and human physical evolution and behavior, and modern human adaptation and variation.



**Saturday, March 21, 2015 at 2:00 PM - Lecture**

**Dr. Deborah Berebichez will discuss "A Non-Stop Skeptic in a Believer's World"**

Dr. Deborah Berebichez grew up in a society where women were discouraged from pursuing Science and ended up the first Mexican woman to get a PhD in Physics from Stanford University. She is a tireless promoter of Science and has a web site [theScienceBabe.com](http://theScienceBabe.com). She has done a presentation on "The Physics of High Heels". She has appeared on TED and been featured in many articles and done physics research related to sound. She speaks 5 languages and has pursued two postdoctoral fellowships in applied mathematics and physics.



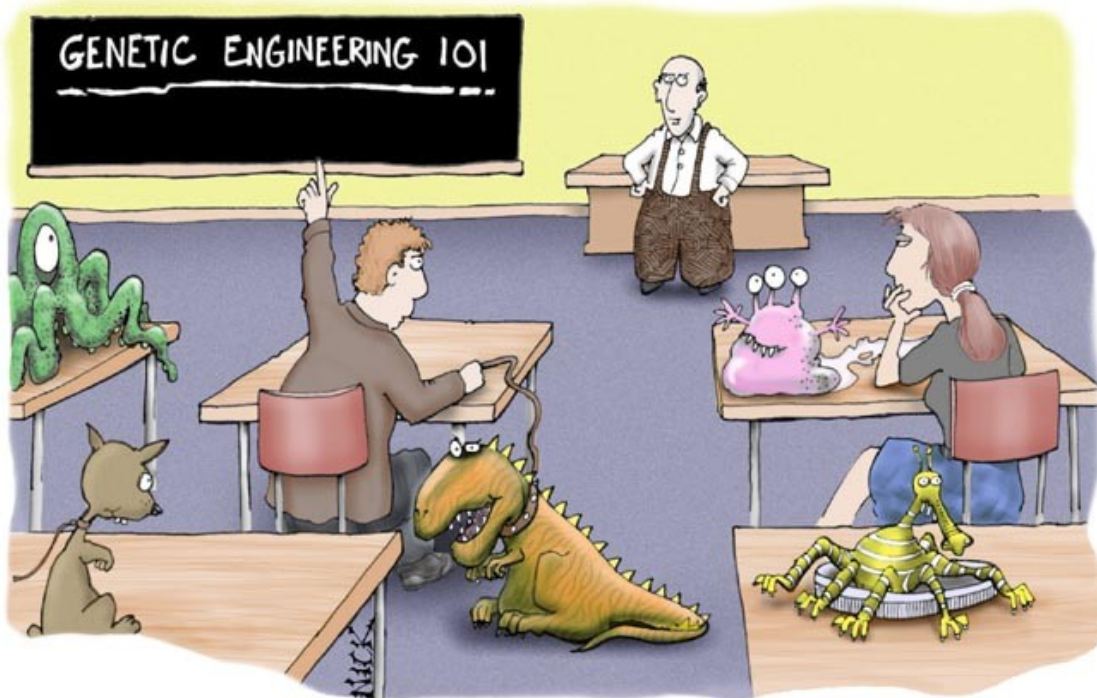
Dr. Berebichez is the co-host of Discovery Channel's *Outrageous Acts of Science* TV show (2012 – 2014) where she uses her physics background to explain the science behind extraordinary engineering feats. She also co-stars on the TV show *Humanly Impossible* (2011) produced by National Geographic channel. For her doctoral dissertation, Dr. Berebichez carried out research in the area of acoustic wave propagation and time-reversal of waves. She invented a highly effective technique in the field of wireless communications whereby a cell phone user can communicate with a desired target user in a location far away. Her work designing novel wireless communications systems has potential advantages over current approaches and is currently in the process of being patented.



Check out the Science Babe's explanation of Time Reversal on Youtube

<https://www.youtube.com/watch?v=vgE5yQ-AdV8>

**April 2015 - Philadelphia Science Fair Lecture**  
**Toxicologist Dr. David Cragin and Science Journalist Faye Flam will discuss the controversy of Genetically Modified Organisms (GMO).**  
**Date and Location to be announced.**



*"Okay—is there anybody ELSE whose homework ate their dog?"*

Cartoon by Nick D. Kim, <http://www.lab-initio.com>  
 Used by permission.

## Saturday, May 16, 2015 at 10:00 AM - PhACT Expedition to the Mullica River

James F. McCloy and Ray Miller, Jr in *Phantom of the Pines* (1998) wrote that in 1928 not far from Batsto “William Bozarth encounters the Jersey Devil along the Mullica River”. And in 1936 at Batsto he “sees the Jersey Devil again.” Henry Charlton Beck in *Jersey Geneses: The Story of the Mullica River* (1945) had noted that the obituary for Fire Warden Bozarth stated that he “was the last man known to have seen The Jersey Devil.”

Our guide, Don Nigrone, will trace two folkloric traditions concerning the Jersey Devil, namely, the witch tradition, dating back to at least 1859, and the curse tradition, from at least 1887, to the present day. Accompanying the expedition will be Robb Kerr and Jeff Cooney, who will be providing zoological and botanical information about the Pine Barrens, and professional photographer Ned Levi, who will be photo-documenting the day's activities. We will meet at the Visitor Center at Historic Batsto Village (<http://www.batstovillage.org/>) at 10:00 AM. After walking through the village, where scenes for *13<sup>th</sup> Child: Legend of the Jersey Devil* (2002) were filmed, we will hike the Tom's Pond Trail (1.8 miles) which proceeds over the Mullica River. After lunch, participants can take a self-guided tour of Batsto Village.

Although we may not find any monsters, we will learn about the history of the bog iron era in the 18<sup>th</sup> and 19<sup>th</sup> centuries in the Pine Barrens and see pink lady's slippers and carnivorous plants like sundews and pitcher plants. Bring insect repellent, sturdy shoes, lunch, and a camera. The event is free and open to the public.



**The wheelwright and blacksmith shops in Historic Batsto Village. Photo by Kim Sheridan**

## Saturday, September 19, 2015 at 2:00 PM - Lecture

### **Professor Paul Halpern will discuss his new book *Einstein's Dice and Schrödinger's Cat: How Two Great Minds Battled Quantum Randomness to Create a Unified Theory of Physics***

Is there a Grand Unified Theory in your future. Come to this meeting to get some insights on this matter.

**Dr. Halpern** is the author of many widely acclaimed popular science books, including *Countdown to Apocalypse*, *The Quest for Alien Planets*, *The Cyclical Serpent*, *The Structure of the Universe*, *Cosmic Wormholes* and *Time Journeys*. He has received accolades and praise from numerous publications, including *Publishers Weekly*, the *San Francisco Chronicle*, *Nature*, *Scientific American*, *Sky & Telescope* and *New Scientist*. *The Cyclical Serpent* was chosen as one of the best Sci-Tech books of 1995 by *Library Journal*, and *Cosmic Wormholes* was chosen as a main selection of the Astronomy and Natural Science Book Club. He has appeared on many television and radio shows, including the PBS series "Future Quest" and the National Public Radio show "Radio Times."

Dr. Halpern was the recipient of a prestigious 2002 John Simon Guggenheim Memorial Foundation Fellowship Award. He was among 184 artists, scholars and scientists nationally selected to receive a fellowship from more than 2,800 applicants for awards totaling \$6,750,000. Guggenheim Fellows are appointed on the basis of distinguished achievement in the past and exceptional promise for future accomplishment. He will use the fellowship award to examine the history of the notion of higher dimensions in science, as well as the impact of this idea upon popular culture. His research, "The Concept of Dimensionality in Science," will cover the period from the mid-19th century, when the idea of the fourth dimension was first introduced, until the late 20th century, when scientists developed 10 and 11 dimensional models of the universe.

A recipient of the Athenaeum Society Literary Award, he has published numerous research articles in the fields of general relativity, cosmology, chaos theory and complexity. In 1996, he was a Fulbright Scholar to Humboldt University in Berlin, Germany, where he studied evolutionary algorithms.

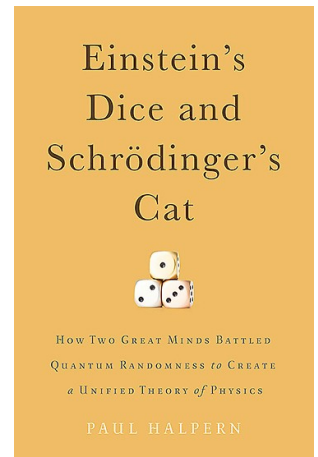
# Einstein's Dice and Schrödinger's Cat: How Two Great Minds Battled Quantum Randomness to Create a Unified Theory of Physics

By Paul Halpern

Publisher: Basic Books 4/14/2015

Hardcover \$27.99 / \$31.00 CAN

ISBN 13: 978-0-465-07571-3 ISBN 10: 0465075711



The story of the doomed competition between two of physics' greatest to create a grand unified theory

Albert Einstein and Erwin Schrödinger were friends and comrades-in-arms against what they considered the most preposterous aspects of quantum physics: its indeterminacy. Einstein famously quipped that God does not play dice with the universe, and Schrödinger is equally well known for his thought experiment about the cat in the box who ends up "spread out" in a probabilistic state, neither wholly alive nor wholly dead. Both of these famous images arose from these two men's dissatisfaction with quantum weirdness and with their assertion that underneath it all, there must be some essentially deterministic world. Even though it was Einstein's own theories that made quantum mechanics possible, both he and Schrödinger could not bear the idea that the universe was, at its most fundamental level, random.

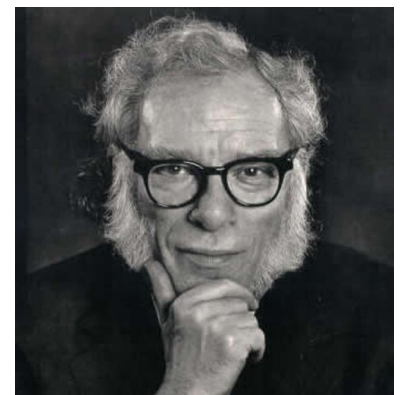
As the Second World War raged, both men struggled to produce a theory that would describe in full the universe's ultimate design, first as collaborators, then as competitors. They both ultimately failed in their search for a Theory of Everything—not only because quantum mechanics is true, but because Einstein and Schrödinger were also missing a key component: of the four forces we recognize today (gravity, electromagnetism, the weak force, and the strong force), only gravity and electromagnetism were known at the time.

Despite their failures, though, much of modern physics remains focused on the search for a Theory of Everything. As Halpern explains, the recent discovery of the Higgs Boson makes the Standard Model—the closest thing we have to a unified theory—nearly complete. And while Einstein and Schrödinger tried and failed to explain everything in the cosmos through pure geometry, the development of string theory has, in its own quantum way, brought this idea back into vogue. As in so many things, even when he was wrong, Einstein couldn't help but be right.

**Paul Halpern** is a professor of physics at the University of the Sciences in Philadelphia, and the author of thirteen popular science books, most recently *Edge of the Universe*. He is the recipient of a Guggenheim Fellowship, a Fulbright Scholarship, and an Athenaeum Literary Award. Halpern has appeared on numerous radio and television shows including "Future Quest," "Radio Times," several shows on the History Channel, and "The Simpsons 20th Anniversary Special." He has contributed opinion pieces for the Philadelphia Inquirer, and is also a regular contributor to NOVA's "The Nature of Reality" physics blog.

**“ Anti-intellectualism has been a constant thread winding its way through our political and cultural life, nurtured by the false notion that democracy means that, ‘my ignorance is just as good as your knowledge.’ ”**

~ Isaac Asimov (1920 - 1992)



# Letters to the Editor

## Letters to the editor are encouraged

Editor: In the October 2014 *Phactum*, p. 7, you illustrated my letter about the "coincidence" of the two math books with the cover of one of the books, *Four Colors Suffice*, together with a description of the book. In yet another remarkable coincidence, the cover is a map of Pennsylvania! You probably can't see it unless you know what you're looking for. The book says the map is from *The Winston Perpetual Loose-Leaf Atlas of the World* (published 1921). I wish I could tell you that we're on it, but we're not. The map goes only about as far east as Lewisburg, and the colored counties are Blair, Huntingdon, and Mifflin (the blue and green regions together make up Huntingdon County).

Howard J. Wilk  
Philadelphia

Editor: This just in – “Effect of a Negative Ion Holographic Bracelet on Maximal Aerobic Performance” (*Journal of Strength & Conditioning Research* 28(10) 2895-2899): “The results of this study provide data that holographic and negative ion technology wristbands...may have no positive effect on exercise endurance.”

Howard J. Wilk  
Philadelphia

Editor: In the October/November/December 2014 *Phactum* there's a letter (page 9) and an article (pages 11 to 13) about malaria. There's also a book review (pages 25 and 26) of *DNA USA: A Genetic Portrait of America*, which mentions the genetic disease sickle-cell anemia. If you've read this far you're probably expecting me to write about some coincidence between the two, and I won't disappoint.

Sickle-cell anemia makes you sick as hell and can kill. You get the disease when you inherit the gene for it from both parents. People with the disease generally have fewer children than people without, so you'd expect the incidence of the gene in the gene pool to be constantly decreasing, and yet it persists. When something like this occurs, it's frequently the case that the gene confers some *advantage*, and that's the case here. People who inherit one sickle-cell gene from one parent and one normal gene from the other parent have what's called sickle-cell *trait*. They usually have few or no symptoms. But they are more resistant to malaria.

When the malarial parasite invades the red blood cells of people with sickle-cell trait, the blood cells become deoxygenated and sickle. They are then destroyed by the body along with the parasite. Where malaria is prevalent, people with some resistance to the disease conferred by *one* gene for sickle-cell anemia generally have more children than people



Enhanced vitality for a paltry \$39.99

without resistance, and so the gene persists in the population.  
Howard J. Wilk  
Philadelphia

Editor: Your article about Joseph Newman and his energy machine is absolutely ridiculous.

It is very important for you to understand that to have any credibility at all it doesn't serve you well to write silly uninformed and ignorant articles without familiarizing yourself with all the facts involved.

Whether Joseph Newman's theories comply with conventional scientific theories or not, his machine was proven to work just as he declared. It was test by many well known specialists in the field and found to be exactly what he



Joseph Newman and his Free Energy Machine

claimed it to be. Now it is up to the scientific community to help him resolve the physics behind it so that all can benefit from it. Organizations such as your own do nothing to advance science into the future. If it were in the hands of people like you skeptic trods, we would never have got past the wheel because "we all know its impossibility to fly". Making the kind of statements that you make only loses you credibility and makes, not your target, but YOU look like the total blind ignoramuses that you are.

No doubt, you will not post this comment but send it into the ether because that's exactly what groups like you do..... good luck facing your truths..

Steve Hiscock  
Kingston, Ontario

Editor: Robert H. Lustig is an endocrinologist at the University of California, San Francisco, who is best known for a YouTube video called “Sugar: The Bitter Truth”, which has been seen more than five million times. In it he calls sugar evil, poison, and a toxin. But not in all forms: Sugar in fruit is OK, according to an online *New York Times* interview (“Learning to Cut Sugar” by Anahad O’Connor, 19 February 2014). That’s because sugar “comes with its inherent fiber, and fiber mitigates the negative effects...There’s only one notable exception: grapes. Grapes are just little bags of sugar.



They don't have enough fiber for the amount of sugar that's in them."

BTW, according to an article in *The BMJ* (not *The British Medical Journal*) (BMJ 2013;347:f5001, "Fruit consumption and risk of type 2 diabetes: results from three prospective longitudinal cohort studies"), greater consumption of specific whole fruits is significantly associated with a lower risk of type 2 diabetes. The fruits? Blueberries, apples, and, of course, grapes!

refs:

<http://well.blogs.nytimes.com/2014/02/19/learning-to-cut-the-sugar/?module=Search&mabReward=relbias%3As%2C%7B%22%22%3A%22RI%3A6%22%7D>

<http://www.bmj.com/content/347/bmj.f5001>

Howard J. Wilk  
Philadelphia

Editor: The winter of 2013-2014 saw a record-breaking irruption of Snowy Owls in many areas of the country. Fast on the owls' heels came Project SNOWstorm, a collaboration between owl researchers, scientists, veterinarians, and conservation organizations. With thousands of Snowies streaming south, the opportunity to learn more about these beautiful



Snowy Owl

white birds was too good to pass up.

Researchers began last winter to gather data about the birds through blood samples, toxicology and DNA tests, and necropsies on deceased owls. In addition, 22 Snowy Owls were fitted with GPS/GMS transmitters. These transmitters enabled researchers to track individual birds throughout the winter using cell phone networks. Though they migrated north for the summer, out of transmitter range, their units continued to collect data. Project SNOWstorm personnel are excited by the recent return south of several tagged Snowies; a summer's worth of data is now accessible, and the birds will continue to be monitored this winter.

Scientists have learned a lot about the owls' behavior on

their wintering grounds, some of it surprising. They hunt ducks, geese and gulls, sometimes over the open ocean, frequently over ice. Range size varies from less than a mile to hundreds of miles. Many of the owls who died did so not of starvation, but collisions with cars and planes or electrocution. A majority of the tested birds were exposed to rodenticides, pesticides and other environmental toxins.

There's a lot of work still to be done in analyzing last year's data, and already Snowy Owls are making their winter appearance. Early indications are for another above-average migration of Snowy Owls, though not as large as last year. Researchers are eager to learn more about these Arctic visitors and will continue working this year to shed new light on the winter life of Snowy Owls.

For more information:

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

Kim Sheridan  
Haverford, PA

Editor's note: See Phactum, January 7014, P. 18.

<http://phact.org/phactums.php>

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## Various Ruminations

of Woo Woo and Real Science  
and some Gossip

Collected/Written by Ray Haupt  
(with help from others)

### Thou shalt not commit logical fallacies

Howard Wilk contributed the link to this Interesting website, which opinion should not be construed as an endorsement of it in its entirety.

[https://yourlogicalfallacyis.com/pdf/LogicalFallaciesInfographic\\_A3.pdf](https://yourlogicalfallacyis.com/pdf/LogicalFallaciesInfographic_A3.pdf).

*Phactum* readers and meeting attendees are invited to pick up *Phactum's Roster of I.R.E. (Infamous Rational Errors)* at PhACT meeting. Furthermore, you are encouraged to submit entries to expand this handy little guide. See Page 2.

This is also available online at PhACT's website at <http://www.phact.org/ire.php>

### More vaccine misinformation debunked

Dr. Stephen Barrett reports in *Consumer Health Watch* of October 6, 2014:

The Children's Hospital of Philadelphia Vaccine Education Center has issued a report intended to reassure parents that the use of aluminum in certain vaccines is safe and that spacing out vaccines to reduce exposure to aluminum is senseless. The report notes:

- Aluminum salts such as aluminum hydroxide, aluminum phosphate and aluminum potassium sulfate have been used to improve the immune response to vaccines for more than 70 years.
- The amount used is far less than the amount required to cause harm.

Given that aluminum is common in food and water, delaying vaccines will not significantly lessen exposure to aluminum but will increase the child's chance of suffering a severe and potentially fatal infection.

#### And for even more information about vaccines

Dr. Paul Offit will discuss his book, *Bad Faith: When Religious Belief Undermines Modern Medicine*, Monday, March 30, 2015 at 7:30PM at the Free Library of Philadelphia at 1901 Vine Street, just a block away from the site of Franklin's Kite & Key Experiment. This event is Free and Open to the Public.

Dr. Offit has been PhACT's speaker in the past and is the Chief of the Division of Infectious Diseases and the Director of the Vaccine Education Center at the Children's Hospital

of Philadelphia and a Professor of Vaccinology and Pediatrics at the University of Pennsylvania School of Medicine.

His many honors include the J. Edmund Bradley Prize for Excellence in Pediatrics from the University of Maryland Medical School and election to the Institute of Medicine of the National Academy of Sciences. Co-inventor of the rotavirus vaccine and a founding advisory board member of the Autism Science Foundation, Dr. Offit is the author of more than 140 papers and five books, including *The Cutter Incident*, *Vaccinated*, *Autism's False Prophets*, *Deadly Choices*, and *Do You Believe in Magic?*. His new book addresses the danger of faith healing.

#### NCCAM renamed

Dr. Stephen Barrett reports in Consumer Health Digest of January 4, 2015:

Congress has changed the name of the National Center for Complementary and Alternative Medicine (NCCAM) to the National Center for Complementary and Integrative Health (NCCIH). The agency, a component of the National Institutes of Health, was initiated in 1991 as an office of unconventional medicine that became the Office of Alterna-

## Reader Participation Wanted!!

Writer's Block can seem insurmountable but is rarely as desperate as pictured here. We invite all Phactum readers to participate by sending Letters to the Editor and Articles for Phactum and let your imagination run wild to express your thoughts on some matter that other skeptics might find interesting. Everyone has something to contribute if one can overcome stubborn writer's block or fear of self-expression. Phactum is a friendly forum (mostly) to express ideas and opinions.

We invite articles and letters on almost any matter except partisan politics and unduly harsh criticism of religion. Great topics include human evolution, free energy, alternative medicine and all sorts of mystical quackery. The End of the World is a great topic as is the flatness of the Earth, and one can hardly have too many tales of Nessie and Bigfoot. Original poetry is invited and please send in a great recipe for Lasagna. Suggestions to improve Phactum are very desired.

We do appreciate participation by readers and at this time in history we especially seek help in revealing news of quackery in the realm of alternative medicine potions, cures, and misinformation as it relates to the **Ebola Epidemic** in Africa and possibly elsewhere. Epidemics are certainly issues where critical thinking and encouragement of science are of great importance and perhaps small organizations like PhACT can help raise awareness, even if only on a small scale.

Please send submissions to the editor by email at: [phactpublicity@aol.com](mailto:phactpublicity@aol.com)



tive Medicine before its elevation to status as an NIH Center. Its currently stated mission is "to define, through rigorous scientific investigation, the usefulness and safety of complementary and integrative health approaches and their roles in improving health and health care." However, most of its research dollars have been wasted and its educational grants have established quackery-promoting facilities in many medical centers.

### Romeo and Juliet Act 2 Scene 2

#### Juliet:

'Tis but thy name that is my enemy;  
Thou art thyself, though not a Montague.  
What's Montague? it is nor hand, nor foot,  
Nor arm, nor face, nor any other part  
Belonging to a man. O, be some other name!  
What's in a name? that which we call a rose  
By any other name would smell as sweet;  
So Romeo would, were he not Romeo call'd,  
Retain that dear perfection which he owes  
Without that title. Romeo, doff thy name,  
And for that name which is no part of thee  
Take all myself.

#### Romeo:

I take thee at thy word:  
Call me but love, and I'll be new baptized;  
Henceforth I never will be Romeo.

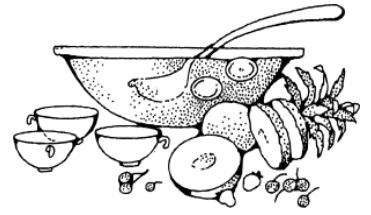
NCCIH new born and new baptized never will be  
NCCAM. Or will it?

### Jersey Devil

A Jersey Devil starts with cranberry juice, apple cider, Applejack, and one apple.

In a large punchbowl pour one gallon of cranberry juice. Add two quarts of apple cider. Add one quart of Applejack. Add one apple sliced thin.

Serves one and JD is guaranteed to appear.



### Homeopathy Can Cure Ebola

Get a load of this item in the November 14, 2014 Daily Mail.

<http://www.dailymail.co.uk/news/article-2839577/Homeopathy-cure-Ebola-Doctors-attack-armchair-intellectuals-World-Health-Organisation-refuse-let-treat-deadly-virus-snake-venom-remedy.html>

It seems that a team of Homeopaths has been active in Liberia and are eager to treat Ebola patients with snake venom, arsenic, and Spanish Fly. They were ridiculed for the assertions but dismiss their critics as "armchair intellectuals".

Speaking to MailOnline, the homeopaths - who are all qualified medical doctors - revealed that they intended to use their time at the Ganta United Methodist Hospital to try to find a homeopathic cure for Ebola.

## Correlation of the Effect of the Month of May on the Mien of the Male and the Feelings of the Female with Meaningful or Meaningless Lyrics in Popular Music

*Howard J. Wilk*

### Data

"Ooh baby, when I see your face, mellow as the month of May, aoh darlin', I can't stand it, when you look at me that way..." ("I Feel the Earth Move", written by Carole King, performed by Carole King); "Bill...I love you so, I always will, I look at you and see the passion eyes of May (eyes of May), oh, but am I ever gonna see my wedding day (wedding day)..." ("Wedding Bell Blues", written by Laura Nyro, performed by Laura Nyro, also by The 5th Dimension).

### Discussion

This author supposes May is as mellow as or mellower than any other month as far as the months go, at least on this part of the planet (Philadelphia, Pennsylvania), but he has no idea what the "passion eyes of May" are.

### Conclusion

There is a correlation.



**Passion Eyes**

(editor's note)

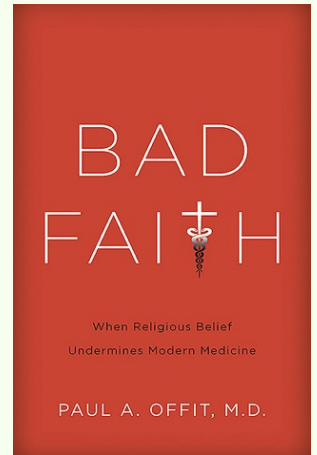


## **Bad Faith: When Religious Belief Undermines Modern Medicine**

**by Paul A. Offit**

**Hardcover: 272 pages Publisher: Basic Books (March 10, 2015)**

**ISBN-10: 0465082963 ISBN-13: 978-0465082964**



In recent years, there have been major outbreaks of whooping cough among children in California, mumps in New York, and measles in Ohio's Amish country—despite the fact that these are all vaccine-preventable diseases. Although America is the most medically advanced place in the world, many people disregard modern medicine in favor of using their faith to fight life threatening illnesses. Christian Scientists pray for healing instead of going to the doctor, Jehovah's Witnesses refuse blood transfusions, and ultra-Orthodox Jewish mohels spread herpes by using contaminated circumcision tools. Tragically, children suffer and die every year from treatable diseases, and in most states it is legal for parents to deny their children care for religious reasons. In twenty-first century America, how could this be happening?

In *Bad Faith*, acclaimed physician and author Dr. Paul Offit gives readers a never-before-seen look into the minds of those who choose to medically martyr themselves, or their children, in the name of religion. Offit chronicles the stories of these faithful and their children, whose devastating experiences highlight the tangled relationship between religion and medicine in America. Religious or not, this issue reaches everyone—whether you are seeking treatment at a Catholic hospital or trying to keep your kids safe from diseases spread by their unvaccinated peers.

Replete with vivid storytelling and complex, compelling characters, *Bad Faith* makes a strenuous case that denying medicine to children in the name of religion isn't just unwise and immoral, but a rejection of the very best aspects of what belief itself has to offer.

In Mumbai, India, Dr Medha Durge, a leader among homeopaths, said they had been keen to try out their own medicines on Ebola victims alongside more conventional treatments. She confirmed that they had used homeopathic treatments on patients, despite the instructions from health officials in the capital Monrovia not to do so. She said she had not felt the need to quarantine herself after returning to India but was monitoring her own condition for any signs of the disease.

The possibility that homeopaths may yet get to treat Ebola patients has alarmed many people working to tackle the spread of the disease, which has claimed more than 5,000 lives in the latest outbreak and which continues to resurface in new hotspots despite some successes in bringing it under control.

Mike Noyes, the head of humanitarian response at UK charity ActionAid, which has teams who support clinics in Sierra Leone and Liberia, told Mail Online: 'With this crisis, you can't be offering false hope. There is no scientific evidence that homeopathy has any impact on dealing with viral disease like Ebola. Coming in from the outside with these unproven approaches is damaging to the response and bringing the disease under control.'

False hope indeed yet Homeopathy seems to thrive in some corners of the world.

### **Homeopaths Without Borders - Ebola Cures**

In an August 2014 news article (<http://www.thebeaverton.com/health/item/1498-homeopaths-without-borders-discover-87-cures-for-ebola-virus>) it is claimed that Homeopaths Without Borders has discovered 87 cures for Ebola. Dr. Ingrid Samet, a homeopathic doctor said "This is the secret that regular doctors have been hiding from us for years: it's one teaspoon diluted mashed flower petals with table salt. This must be used orally and can be applied to the central bottom of the patient's right foot [only the right foot? not the left?] for increased potency. Venom of a bush-master snake, laced with water and brandy can also do the trick."

Homeopathic organization will be sending life saving remedies such as diluted horseflyweed and diluted yellow jasmine to stop the spread of the disease without using any toxins.

"Ground oyster shells and diluted lavender will cure your ebola," said another homeopathic doctor who is credited for discovering two cures for HIV and another for the Plague.

Despite these testimonials we remain skeptical of homeopathic cures.

### **Homeopathy for Ebola: an update directly from the 'horse's mouth'**

The following item appeared in Dr. Edzard Ernst's blog-site, published Friday 28 November 2014. Dr. Ernst is an

expert and critic of alternative medicine and its practitioners.  
<http://edzardernst.com>

A German homeopathic journal, Zeitschrift Homoeopathie, has just published the following interesting article entitled HOMEOPATHIC DOCTORS HELP IN LIBERIA. It provides details about the international team of homeopaths that travelled to Liberia to cure Ebola. Here I take the liberty of translating it from German into English. As most of it is fairly self-explanatory, I abstain from any comments of my own – however, I am sure that my readers will want to add their views.

*In mid-October, an international team of 4 doctors travelled to the West African country for three weeks. The mission in a hospital in Ganta, a town with about 40 000 inhabitants on the border to Guinea, ended as planned on 7 November. The exercise was organised by the World Association of Homeopathic Doctors, the Liga Medicorum Homoeopathica Internationalis (LMHI), with support of by the German Central Association of Homeopathic Doctors. The aim was to support the local doctors in the care of the population and, if possible, also to help in the fight against the Ebola epidemic. The costs for the three weeks' stay were financed mostly through donations from homeopathic doctors.*

*"We know that we were invited mainly as well-trained doctors to Liberia, and that or experience in homeopathy was asked for only as a secondary issue", stresses Cornelia Bajic, first chairperson of the DZVhA (German Central Association of Homeopathic Doctors). The doctors from India, USA, Switzerland and Germany were able to employ their expertise in several wards of the hospital, to help patients, and to support their Liberian colleagues. It was planned to use and document the homeopathic treatment of Ebola-patients as an adjunct to the WHO prescribed standard treatment. "Our experience from the treatment of other epidemics in the history of medicine allows the conclusion that a homeopathic treatment might significantly reduce the mortality of Ebola patients", judges Bajic. The successful use of homeopathic remedies has been documented for example in Cholera, Diphtheria or Yellow Fever.*

*Overview of the studies related to the homeopathic treatment of epidemics*

*In Ganta, the doctors of the LMHI team treated patients with "at times most serious diseases, particularly inflammatory conditions, children with Typhus, meningitis, pneumonias, and unclear fevers – each time only under the supervision of the local doctor in charge", reports Dr Ortrud Lindemann, who also worked obstetrically in Ganta. The medical specialist reports after her return: "When we had been 10 days in the hospital, the successes had become known, and the patients stood in queues to get treated by us." The homeopathic doctors received thanks from the Ganta hospital for their work, it was said that it had been helpful for the patients and a blessing for*

*the employees of the hospital.*

### *POLITICAL CONSIDERATIONS MORE IMPORTANT THAN MEDICAL TREATMENT?*

*This first LMHI team of doctors was forbidden to care for patients from the "Ebola Treatment Unit". The decision was based on an order of the WHO. A team of Cuban doctors was also waiting in vain for being allowed to work. "We are dealing here with a dangerous epidemic and a large number of seriously ill patients. And despite a striking lack of doctors in West Africa political considerations are more important than the treatment of these patients", criticises the DZVhA chairperson Bajic. Now a second team is to travel to Ganta to support the local doctors.*

And Dr. Ernst's readers did respond, both pro-homeopathy and con. Some of the comments are hilarious on both sides of the issue.

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**MCHUMOR.com** by T. McCracken



Ben Franklin jump-starts his car.

Cartoon by T. McCracken  
<http://www.mchumor.com/>  
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# Meeting Reports - October/November 2014

Reported by: Gabriela Alfaro, Kenneth Ho, and Teweldeberhan Misghina who are Physics students of Dr. David Cattell at Community College of Philadelphia.

## **The End of the World — Again: Why the Apocalypse Meme Replicates in Media, Science, and Culture A Lecture by Professor Barry Vacker of Temple University Saturday, October 18, 2014**

### **Reported by Gabriela Alfaro**

The idea of the end of the world and the way it moves masses of people to do things out of this world questions the importance of human existence. Professor Barry Vacker discusses the impact of technology and contemporary media in society and the idea of the apocalyptic stigma overwhelming the way many people live. His book (ideally published on December 21st, 2012), *The End of the World- Again: Why the Apocalypse meme Replicates in media, Science, and Culture?*, explores the hysteria created by the media reporting on the apocalyptic events we have encounter in the late years (the year 2000, the end of the Mayan Calendar, and such.)

The book tries to explore why these events continue to affect society even though we are in the 21st Century. For example, why is it that 10% of the world really thought that the world was going to end on December 21st, 2012? It is because there is an advantage to believing these predictions. But to understand those advantages, one must first think of the types of people that are among those affected by the apocalyptic events. There are three types, those that believe the end of the world will not happen, those that believe that the end will happen, and those that believe the end already happened. In one way or another, these three types of people are driving the culture of the apocalyptic meme.

With that distinction made, media found the one thing that touches all those people and sells billions of dollars in movies that focus on that topic alone. To every apocalyptic scenario, movie, book, or story, there is the end to the problem and the promise for a new beginning. This is seen throughout history with all the wars and the nuclear tension in the Cold War and the hope of something better in a near future. Vacker shows many examples of this phenomena and realizes that there has to be an enough public interest for this theme to show up in so many ways.

The conclusion made is that human beings are very self-centered. Humans really believe that the world will end, they will live to experience it, and they will get a new beginning. This taps into the way technology, mostly Smartphones, have been able to make us the center of our own little world. All this media raises questions about our existence, an uncomfortable topic for many people. Humans are not use to the idea that earth is not the center of the anything, we are only the center of our own consciousness. And until society learns to accept that, media will continue to take advantage of our interest of the end of the world and a new beginning.

### **Reported by Kenneth Ho**

Professor Barry Vacker's lecture on his book "The End of the World – Again: Why the Apocalypse Meme Replicates in Media, Science, and Culture" investigates the recurring interest in apocalyptic scenarios. From ancient Mayan calendars and legends of exterminating floods to modern films such as "The Matrix" and "2012", he explores the deeper psychological and sociological meaning behind mankind's fascination with such scenarios and how our modern apocalyptic scenarios can reflect our post-industrial and digital culture.

One of the first examples he looks at was the recent 2012 apocalypse scare. Despite the date December 21 having little

apocalyptic significance, many people around the world took it very seriously. In fact, the mayan calendar as explained by Vacker did not really end on that date, but was intended to simply start again afterwards, much like how we reset our yearly calendars at the end of the year. It wasn't the end of anything, but a marker in a cyclical repetition. There are many other examples of our obvious interest in our own doom, varying from science-fiction scenarios of extraterrestrial invasion and zombie apocalypses to more grounded science scenarios of ecological and cosmic apocalypses. Vacker establishes that there are only three possibilities when considering the apocalypse: It will not happen, it will happen, or it has already happened. Each of these can be seen in a lot of the modern apocalyptic media. For example, the film "Seeking a Friend for the End of the World" portrays an impending astronomical doom of which there is nothing that could be done about it, while the film trilogy "The Matrix" tells a story of the world after the apocalypse has already happened.

He also raises questions about the priorities we put when dealing with the apocalypse. Since the release of the film "Armageddon" in 1998, it has grossed over 550 million US dollars. A staggering amount in contrast to the NEO program, a NASA program dedicated to detecting and tracking near-earth objects, which is funded only 4 million US dollars a year. One is a science fiction film about an impossible asteroid bringing impending doom to the whole earth, while the other is a program that could possibly predict a very real threat to the earth's existence as we know it. Why is it that we spend so much on teasing the idea of the apocalypse and yet spend so little in actually preventing it? Or perhaps, as Vacker suggests, are we too preoccupied destroying ourselves with the 1.5 trillion spent on war every year?

To explain why we have so much interest in this, Vacker describes three drives or reasons we feel so compelled to explore the apocalypse. The first is a fear of the uncertain future. By immersing ourselves in these scenarios, we pre-emptively prepare ourselves for the future possibility of it coming true. A "There's danger around the corner. Turn back!" reaction to ensure it doesn't come to pass. The second is the yearning to see a new beginning. Our interest doesn't lie in the end, but the chance to be part of a new beginning. After the apocalypse, those who survive will have a metaphoric and literal clean slate to begin their new world. Or in the case of Armageddon and other like media, by preventing the apocalypse, they will be a part of a transformed consciousness that saved the world. The last drive is quite simply put, arrogance. Mankind has always had a sense of cosmic centrality, a belief that we as individuals or as a race are special. Apocalypse scenarios feed into that in different ways. If the end was avoided then it proves that mankind was indeed special and deserved the central stage. If the end could not be avoided, then it introduces a fear of humility, suggesting that there is little meaning to our existence and questioning much of what we think we know.

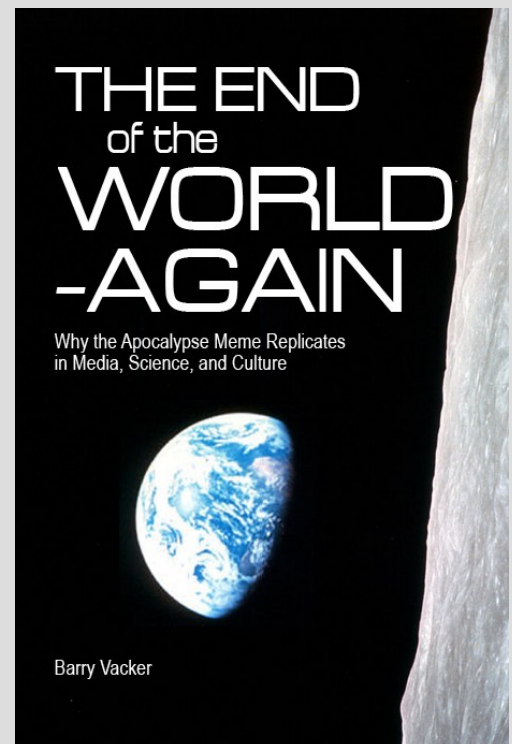
## "The End of the World Again: Why the Apocalypse Meme Replicates in Media, Science, and Culture" by Barry Vacker

**Publisher: Center for Media and Destiny; 1st edition (December 21, 2012)**

**ISBN-10: 0979840465 ISBN-13: 978-0979840463**

**Paperback: 171 pages**

Doomsday scenarios. They proliferate in our culture, from economics to ecology, theology to technology, biology to cosmology, James Bond to Slavoj Zizek, Plato's Atlantis to Lars von Trier's Melancholia. With creativity and critical insight, Barry Vacker shows why apocalyptic memes replicate and have built-in survival advantages. He also explains how the doomsdays reveal the deeper challenges facing human existence -- the philosophical apocalypse effected by our lack of cosmic meaning in the vast universe. Have we really embraced our true existence on Spaceship Earth floating in the cosmos of the new millennium? Our calendars say we have passed the year 2000, but have we really entered the new millennium? The End of the World -- Again offers an original, exciting, and (for some) terrifying critique of culture in 2012 and beyond.



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Towards the end of his lecture Professor Vacker explains why he used a hauntingly beautiful image of the original “Earthrise”, a picture taken during the Apollo 8 mission to Mars showing Earth as a sphere rising from the surface of the Moon. It inspires breathtaking humility when seeing things on a planetary scale. The trillions of dollars spent on drawing lines on maps don’t even show up when seeing the real thing. This photo marked the end of the world with humans as the center, depicting how truly small we are and yet how far we have gone. Vacker ends with a quote from Jean Baudrillard, a French philosopher and cultural theorist, “Imagine the amazing good fortune of the generation that gets to see the end of the world. This is as marvelous as being there in the beginning.”

## **Neuroethics: the Perils and Potential of Brain Science**

### **A Lecture by Dr. Ted Schick, Professor of Philosophy at Muhlenberg College**

### **Saturday, November 15, 2014**

#### **Reported by Kenneth Ho**

Dr. Ted Schick, professor of Philosophy and Director of the Muhlenberg Scholars Program at Muhlenberg College, brings to light an ongoing brain-race, a modern frontier in neuroscience to create a full map of every neuron in the brain. The \$1.6 billion European Human Brain Project and the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) are providing breakthroughs in understanding the complexity of the human brain and new knowledge in the capabilities in utilizing this information. This research has provided a whole range of new technologies including lie detecting technology, memory recall technology, and even medical application of altering the very neurons responsible for many psychological and medical disorders. However, this new technology and understanding doesn’t come without its own ethical quandaries as to what we are as humans as well as how far we should go in altering the chemical balances in our brains.

Schick explains two fields of thought concerning our conceptions of the essence of human existence. First is the dualist way of thinking, where the understanding is that we exist as two separate entities, the material substance and the mental or spiritual substance. This commonly accepted hypothesis separates our physical bodies from our deeper mental existence. The idea is that our mind and soul are independent of our bodies and thus upon our deaths, our spiritual existence can continue in another form or place; a Platonic approach to spirituality. The other hypothesis is a more holistic understanding where there is no separation between the mind and body and thus no spiritual resurrection of any form. Ironically, the holistic approach is one championed by the most forefront Christian scholars as well as the recent discoveries in neuroscience. The understanding gained from brain research has shown that our thoughts, memories and actions are wholly dependent on the neural activity and chemical balances in our brain. Thus our physical actions, behavior, and the very thoughts we have can be understood, predicted and even changed through research of the brain. It is not a relay station for our soul and when brain dies, you also cease to exist.

Some of the research has yielded methods of detecting lies, changing memories, emotions, and even our psychological state. Each of these yields a whole range of neuro-ethical questions that needs to be answered. How far should we go in changing our minds before it becomes unethical? For example, through altering our chemical balances or through electrotherapy, it is possible to change our emotional reaction to memories and even so far as removing memories. Is it ethical to do so? Do we remain the same person if we removed our memories? Another example is the legal aspect of handling psychological disorders and violent tendencies. Modern neuroscience has found certain chemicals in the brain and the presence of certain genes that increases the likelihood of violence by 400% in those who had traumatic childhood experiences. While it may seem more efficient to alter those chemicals our memories associated with violence, is it ethical to tamper with a person’s very personalities? Should our prison systems be less focused on retribution and rather be neuro-therapy facilities?

There are many more questions that require much more thought such as the definition of death for vegetative patients and the ethics of memory association and lie detection in a court of law. As the frontier of neuroscience continues to expand and our understanding of our brain continues to grow, so does our responsibility to create ethical standards to stand by. This field of science will affect many aspects of our society, from legal proceedings to the way we consider our existence and free will. These discoveries will likely have a deep impact in the future and the questions Dr. Ted Schick proposes will shape the direction of progress in the coming years.



### Reported by **Teweldeberhan A. Misghina**

While doing a little research on scientific journals for my Biology class, I came across an interesting article, “Extinct species can be resurrected”. It appears, according to the journal, that no scientist disagreed on the possibility. I wasn’t fascinated about the advancement of genetic engineering, but about the insanity of those scientists who care to resurrect those extinct species. I think the world is already crowded. After all, those species had their chance and they didn’t succeed in their struggle for survival. On a recent PhACT meeting that I had a chance to attend, Dr. Ted Schick presented a very interesting technological advancement on Neuroscience. He, with ample evidence, demonstrated that despite the moral issue, it is possible to toy with the human brain and help modify its defects. While I agree with Dr. Schick that science is advancing beyond our capability to control it, I do not like the idea of these technologies being used to alter the natural functions of human brains.

According to Dr. Schick, human brain works in a specific way, and therefore, his actions are not the result of external factors. A person’s brain can clearly be studied using fMRI and other neuroscience devices. Using these devices, scientists can read people’s intentions. For instance, if a person is planning on committing a crime, even before he/she consciously processes it, the person can be identified using these devices. Moreover, the outdated and inefficient lie detectors are worthless compared to these more accurate devices. However, reading the brain is not the end of neuroscience, it can also help modify the brain. Dr. Schick explained that many criminals commit crimes because of their natural brain orientation, and such problems can be modified using this neuroscience technology. Although cautious about the morality of the issue, he predicts that erasing human memories and re-programming them may be a practice on the horizon. Casually, he addresses the issue of morality by asking, “Is it more moral to execute criminals or to re-program them and give them a second chance?”

With all due respect to the undisputed role of science in revolutionizing our lives positively, especially since the late 20<sup>th</sup> century, no man made technology had proved absolutely reliable. Therefore, I wish that scientists were more responsible than becoming accessories of the destruction of humanity by interfering with individual’s liberty. If neuroscience is granted authority to toy with human brain, I can predict the irreversible tragedy that can result. Even if such technologies were reliable, who decides what good behavior is. If such technology be legal, that will be the end of individual liberty, because as Dr. Ted Schick has mentioned, the free will of human being will be compromised forever.

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## How to Think about Weird Things: Critical Thinking for a New Age by Ted Schick and Lewis Vaughn

**Publisher: McGraw-Hill Humanities/Social Sciences/Languages;  
7th edition (January 28, 2013)  
ISBN-10: 0078038367 ISBN-13: 978-0078038365  
Paperback: 352 pages**

This brief, affordable text helps students to think critically, using examples from the weird claims and beliefs that abound in our culture to demonstrate the sound evaluation of any claim. It explains step-by-step how to sort through reasons, evaluate evidence, and tell when a claim (no matter how strange) is likely to be true. The emphasis is neither on debunking nor on advocating specific assertions, but on explaining principles of critical thinking that enable readers to evaluate claims for themselves. The authors focus on types of logical arguments and proofs, making *How to Think about Weird Things* a versatile supplement for logic, critical thinking, philosophy of science, or any other science appreciation courses.



## At the Wagner Free Institute of Science

1700 W. Montgomery Ave., Philadelphia, PA 19121 215-763-6529 Tuesday-Friday 9am-4pm

<http://www.wagnerfreeinstitute.org>

### Weeknights at the Wagner

**Thursday, February 26th, 6 – 7:30pm:** Weeknights at the Wagner – Aquatic Underdogs: How Freshwater Mussels Can Help Save our Great Waters, Dr. Danielle Kreeger, Partnership for the Delaware Estuary

**Saturday, February 21st:** Westbrook lecture – Times and speaker TBD

**Saturday, April 11th, 12 – 4 pm:** Special Community Program – Unedited North Philadelphia: Part II, in partnership with the Wagner, The Special Collections Research Center at Temple University Libraries, The Beech Companies, and The Philadelphia History Truck (This is a screening of archived news footage featuring the people, places, and events that shaped the neighborhood around the Wagner. It is a follow up to a popular event we held in November and will be on a Saturday afternoon. The building and museum will be open to the public during the program and we will have the Philly History Truck here to record people's stories.)

**Sunday, April 26th, 12 – 4 pm:** Lights, Camera, Wagner, a Family Program that is part of the Philadelphia Science Festival. The day will feature hands-on activities related to historic photography and electric technology.

**Wednesday, May 20th, 6 to 8:30 pm:** Weeknights at the Wagner and Member Reception – Philadelphia, 1865, Bruce Laverty, The Athenaeum of Philadelphia

### Adult Education Course Schedule Winter/Spring 2015 Courses

**Fungi in the Garden**, Professor Karen Snetselaar.

Tuesday, January 20 and 5 Mondays, January 26 - February 23, 2015, 6:30 - 7:30 PM. Pennsylvania Horticultural Society, 100 N. 20th St. (20th and Arch Sts.). This course will look at groups of fungi that are particularly important to plants, including fungi that promote plant growth and those that cause diseases.

This course requires preregistration.

This course is full.

Add your name to the waitlist online or call 215-763-6529 x23.

**Biochemistry of the Senses**, Professor Joseph B. Rucker.

7 Wednesdays, January 21 - March 4, 2015, 6:15 - 7:30 PM. Independence Branch of the Free Library, 18 S. 7th Street (between Market and Chestnut). This course will explore the molecules and mechanisms that enable us to see, hear, feel, smell, and taste the

world.

No preregistration necessary. Register by attending the first course.

**The Periodic Table of Elements: How We Got It and How You Can Use It**, Professor Kevin Cannon.

6 Mondays, February 2 - March 16, 2015, 6:30 - 7:45 PM and 1 Tuesday evening field trip. Falls of Schuylkill Neighborhood Branch of the Free Library, 3501 Midvale Avenue (at Warden Drive).

After an introduction to atomic structure and the elements, this course will examine how the periodic table is used and provide a history of its conception and evolution.

No preregistration necessary. Register by attending the first course.

**Introduction to Developmental Biology**, Professor Mary Beth Davis.

6 Wednesdays, March 25 - April 29, 2015, 6:15 - 7:30 PM. Independence Branch of the Free Library, 18 S. 7th Street (between Market and Chestnut). This course will offer a very basic introduction to the field of developmental biology, including the fundamental question of how a single cell can give rise to the multitude of cell types found in complex, multicellular animals.

No preregistration necessary. Register by attending the first course.

**Public Health, Public Parks**, Professor David Hewitt.

6 Tuesdays, March 31 - May 5, 2015, 6:30 - 7:30 PM. Pennsylvania Horticultural Society, 100 N. 20th St. (20th and Arch Sts.). This course will provide a broad overview survey of the changing wetlands and waterways of Philadelphia and look at how they have interacted with and been affected by the flora, fauna and human land use of the region.

This course requires preregistration.

This course is full.

Add your name to the waitlist online or call 215-763-6529 x23.

**The Wagner Free Institute of Science provides an educational experience for over 20,000 school children each year for no charge what-so-ever. All programs at the Wagner are free, paid for by a dwindling endowment, by grants, and donations. All Wagner programs are free to the public, but obviously are not "free" of cost. Donations are appreciated.**

# The data are overwhelmingly equivocal

by Howard J. Wilk

“Anti-inflammatory interventions and skeletal muscle injury: benefit or detriment?” Urso, Maria L. *Journal of Applied Physiology*, vol. 115 no. 6 pp. 920-928. DOI: 10.1152/jappphysiol.00036.2013. “In general, the data are overwhelmingly equivocal.”

Science has given the public a lot of contradictory nutritional information about what’s good for us and what’s bad for us. See, for example, F.D. Flam’s article <http://www.forbes.com/sites/fayeflam/2014/10/30/holy-cow-study-suggests-milk-is-bad-for-bones-heart-has-the-medical-establishment-lied-to-us/>.

Coffee and alcohol were bad for us before they were good for us. Cholesterol and saturated fat from animal sources were bad, carbs and unsaturated fat from vegetable sources were good; now, apparently, saturated fat isn’t bad for us after all but carbs are the real villains.

Perhaps a lot of the confusion can be cleared up once we abandon the idea that “health” can be expressed as a single variable under all circumstances.

The first criterion of being healthy is the state of being alive rather than dead. In our evolutionary history, survival might have meant being able to track a herd of animals twenty miles a day. It might have meant out-wrestling a hyena for its kill or yours. It might have meant surviving a year of famine conditions. It might have meant being able to make a short, fast dash to get within spear-range of an animal and then to hurl the spear at high speed at the animal. (Or at the fellow hunter with whom you’re competing for women, in the interest of passing down your genes.)

With regard to fitness and body type for these requirements for survival--for “health” in the most fundamental sense--one size definitely doesn’t fit all, and there’s no reason to believe one diet fits all, either.

Consider antioxidant vitamins such as C and E, and polyphenolic phytochemicals (plant chemicals) found in fruits. They’re good for us, right? And of course NSAIDS (non-steroidal anti-inflammatory drugs) like aspirin and ibuprofen, which are cyclooxygenase (*COX*) inhibitors, are useful for treating soreness and muscle injury.

But now consider that muscle building is an *inflammatory* response that involves *oxidation* reactions catalyzed by *COX* and other enzymes. And what, exactly, is being oxidized? For one, an omega-6 fatty acid called arachidonic acid. Our bodies can synthesize arachidonic acid from

another omega-6 fatty acid called linoleic acid, which is the most common polyunsaturated fatty acid in food. But that synthesis competes with the synthesis of the omega-3 fatty acids EPA and DHA (common in fish oil) from the omega-3 fatty acid  $\alpha$ -linolenic acid, found in, for example, flaxseed oil and walnuts.

Or you can increase your levels of arachidonic acid by consuming it directly. The best sources? Eggs. Haggis. (As prepared, for example, by Tom Napier.) OK, maybe not haggis literally, but liver and other internal organs. There is one commercial non-animal source of arachidonic acid, oil from the fungus *Mortierella alpina*, which is so foul-tasting I’d rather eat haggis, and I don’t even eat meat.

So, for your serious strength athlete interested in muscle mass, strength, and power, or for your AARP-age accountant interested in “toning”--a word whose meaning I have never understood--are vitamins, antioxidant phytochemicals, and treatment of soreness or injury with NSAIDS bad or good? The above-cited paper is unambiguous on this point: The data are overwhelmingly equivocal.

A lot seems to depend on what the exercise is, who’s doing the exercising, and the timing, type, and amount of the foods, supplements, or drugs. It could be no pain, no gain; but then again you can be too sore for your next workout. Or maybe a certain level of inflammation is useful, and only the most acute inflammation immediately after exercise (treated then or by something taken beforehand) should be addressed. Or maybe you should allow the inflammation to proceed unabated for a while before you begin to assist recovery with the various agents.

Of all this I am absolutely certain.

**Editor’s note:** Howard submitted this article to *Phactum* ten days before the article "Why Antioxidants Don't Belong in Your Workout" appeared in the November 26, 2014 *New York Times*." He doesn't want critical thinkers to think he is a copycat or plagiarist of the NYT.

**Howard J. Wilk** is a chemist and a long time skeptic living Philadelphia.

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# Off the Beaten Path

By Kim A. Sheridan

## Cold Duck



The wind is bitter, whistling past the lighthouse to whip the Inlet into a frenzy of white caps. An ornate coating of ice drapes the buoys in the bay. Waves wash over the jetty and recede, leaving behind rapidly freezing puddles. The deserted beach inspires dreams of hot cocoa by a fire, not beach umbrellas and picnic baskets. Yet, for those in the know, winter is the best time to visit Barnegat Lighthouse State Park on Long Beach Island. Why? Because that's when the winter ducks are there, of course.

Red-breasted Mergansers with their tufted hairstyles, pink-billed Long-tailed Ducks and large Common Eiders all bob in the cold waters of Barnegat Inlet. Common Loons and three different species of Scoters join them. Purple Sandpipers forage on the rocks. Snow Buntings and Horned Larks might be lurking in the dunes, and sometimes harbor seals are seen frolicking in the deep water.

It's the colorful Harlequin Ducks that attract the most attention at Barnegat Light. Males sport an intricately patterned wardrobe of slate blue, russet, black and white. Most of the other ducks can be spotted feeding and swimming at some distance from the jetty, but the Harlequins are particularly fond of turbulent water. They thrive in the perilous zone where the waves collide with the jetty.

Most of these birds breed far to the north; Barnegat Light is their winter home. How do birds keep warm swimming and diving in the icy water while we humans are shivering on dry land? It starts with their feathers. Next to the skin lies a thick insulating layer of down feathers. Above the down are layers of interlocking and overlapping feathers that leave a minimum of bare skin exposed to the elements. The birds attend meticulously to feather maintenance with liberal doses of preen oil. Look closely at a duck after it surfaces from a dive, and you will see the water beading up and running from its waterproof feathers like rain from a freshly waxed car. Ducks' feet and legs lack feathers to protect them, and could be a dangerous source of heat loss. But water



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**Harlequin Duck at  
Barnegat Lighthouse State Park, February 2014.  
Photo by Kim Sheridan**



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**Red-breasted Merganser, February, 2014.  
Photo by Kim Sheridan**



**Barnegat Lighthouse, September, 2011.  
Photo by Kim Sheridan**

birds have evolved to combat this by utilizing a countercurrent heat exchange system. A distinct structure known as the rete mirabile in the upper leg consists of an intertwined web of small arteries and veins. As hot blood in the arteries flows into the rete mirabile, it transfers heat to the cold venous blood returning from the feet. Blood that reaches the feet is much colder than the body, close to the temperature of the water in which the duck swims, but the blood that returns to the heart is warm. This heat exchange minimizes heat loss from the legs, while maintaining a healthy body core temperature. Cold feet, warm heart!

**IF YOU GO:** Barnegat Lighthouse, first lit in 1859, is 172' tall, with 217 steps. The Lighthouse is open for climbing weekends from 9 AM to 3:30 PM (weather permitting); a fee is charged from Memorial Day to Labor Day. The State Park is open daily from 8 AM to 4 PM year-round.



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**Long-tailed Duck, February, 2014.  
Photo by Kim Sheridan**

Office hours are 8 AM to 3:30 PM Monday to Friday. Admission is free. There is an Interpretive Center and a short Maritime Forest Trail at the site.

To see the birds in the Inlet, you will need to walk along the jetty. It is always colder and windier here than more protected areas, and water and spray splash both the rocks and the people on them. Wear windproof and waterproof clothing and boots with good grippy soles. Choose a day with light winds and low tide for exploring.

From the lighthouse base the jetty extends over a mile along the south side of Barnegat Inlet toward the sea. The first 1000' is handicapped-accessible, topped with a concrete walkway and lined with railings. For the rest of its rocky length, walking is challenging, and potentially dangerous. Accidents have occurred there. The rocks will be slippery with water, ice and bird droppings, so always look where you are stepping. Use common sense and don't go farther than your comfort level allows. With proper planning, clothing and care, the cold ducks of Barnegat Inlet are well worth the trip.

Barnegat Lighthouse State Park  
Barnegat Light, NJ 08006  
(609) 494-2016

<http://www.state.nj.us/dep/parksandforests/parks/barnlig.html>

The park can be reached by taking the Garden State Parkway to exit 63. From Route 72 east, turn left onto Long Beach Blvd., drive to the north end of the island, and then turn left onto Broadway. The park entrance is on the right.

[NOAATidesFacade.jsp?Stationid=8533615](http://NOAATidesFacade.jsp?Stationid=8533615)

**The Friends of Barnegat Lighthouse:**

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

**A history of Barnegat Lighthouse:**

<http://www.lighthousefriends.com/light.asp?ID=380>

**Tide information:**

<http://tidesandcurrents.noaa.gov/noaatidepredictions/>

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Harlequin Duck portrait, February, 2014  
Photo by Kim Sheridan



## The God of the Bible is a Myth: A Biological Basis for Religious Belief ©

by Norman Vadner

### Preamble

A large portion of the population is religious, despite a lack of any sound, rational basis for such belief. This paper demonstrates the irrationality of religion, and identifies the biological basis that drives the unsupported belief in a supernatural power. It presents the possibility that people who are strongly religious may be so driven to such beliefs by their biology — that they may be unable to hold a balanced discussion on theology.

Yes, there may be an unknown higher power responsible for the universe and (indirectly) human existence, but there is no reasonable basis supporting the belief that it is the God of the bible.

### Introduction

Science informs us that approximately fourteen billion years ago mass and energy, the building blocks of our universe, exploded from a very tiny space. This may be difficult for us to comprehend intuitively — but it is the hard science on which we must rely. The evidence underlying the Big Bang theory is wholly supported by most cosmologists. About five billion years ago our solar system started forming. A billion years ago life appeared on Earth, emanating from inorganic sources. Then, around 200,000 years ago, what we regard as the first modern humans (*Homo sapiens*) appeared.

Humans are driven by an insatiable urge to understand

the source and destiny of their existence. As the song *Let the Mystery Be* says, “Everybody is a wonderin’ what and where they all came from. Everybody’s worryin’ bout where they’re gonna go when the whole thing’s done.”

Many guesses and hypotheses have been conjured up to answer these age-old questions. We are familiar with the view of the ancient Egyptians, Greeks, and Romans and their plethora of pagan gods. No one believes in these gods today. As the multitude of ancient deities was discredited, they were replaced, over the millennia, by the belief in a single god. Or, put another way, one supreme being. From time to time, individuals such as Jesus of Nazareth have stepped forward claiming to be an earthly spokesperson for this alleged supreme being. Later followers claimed that Jesus was the son of God. Jesus was able to convince enough people of his views to create a significant following — a following that has grown to number over one billion people.

With the alleged benefits of unconditional love, answering of prayers, forgiveness of sins, and eternal life, it is understandable why so many are attracted to Christianity. This is despite the complete absence, however, of any proof of the existence of the God of the bible. Indoctrination from an early age, and association with those of similar views, contributes to such belief.

Some individuals look at these beliefs and find them baseless, wondering why so many of their peers embrace them. The answer lays in differing physiologies — more specifi-

cally, an area of the brain that directs religious belief. Biological makeup, coupled with the factors noted above, drive many individuals toward religious belief — despite no sound rational basis for such belief. Though not scientifically proven to be false (it can neither be proven or disproven), such belief is nevertheless highly suspect.

While the factors cited above press many individuals strongly toward acceptance of religious belief, another factor also enters — the suspension of rational judgment. A unique and fascinating aspect of religious belief is “compartmentalization.” Somewhat surprisingly, this strong attraction to religion and the suspension of rational judgment in its acceptance does not extend to other areas of thought. Thus, religious adherents appear no different in other cognitive areas. They are apparently just as capable as non-religious folks in other areas of life, and can function just as rationally and competently in a non-religious context. With widespread peer acceptance of what appears to be a delusion (religion), it is difficult if not impossible to convince religious adherents of the lack of soundness of their views. So long as religion remains a personal matter, there is no need to change anyone’s mind. For most social and practical matters, these differing views concerning religion are ignored. Important exceptions exist, however, when religious adherents take their views to the inevitable logical extremes . . . and especially when they try to impose their views on others. Examples include substituting prayer for modern medical treatments, or enforcing religious edicts in the realm of pri-

vate and personal matters, such as reproduction. Here, religion has taught the religious that their beliefs are both absolute and certain. Their (unsubstantiated) certainty can cause them to force these, sometimes, extreme views on their children and other members of society. The resulting situations can be intrusive, highly confrontational and, in extreme cases, even life-threatening.

### The Man Behind the Curtain

This paper does not deny the possibility of the existence of an unknown higher power, a power which has in some way affected the existence of the building blocks of the universe — mass, energy, space and time. Nor does this paper deny the transcendental “other worldly” mental experiences achieved at times through prayer, meditation, and chemical or electrical stimulation. This paper contends that neither belief in the existence of a universal higher power nor the mystical, yet powerful, neurological experiences of the religious lend any rational evidence in support for the God of the bible. The God of the bible — and much of the story line contained in the bible — are the creation of, or really the guesswork of, human minds. To cite the bible’s premise of God as the justification for guiding human behavior is, therefore, unsound. For whatever unknown intelligent power that may actually exist, the evidence is slim, and the difficulty of interpreting such slim evidence is extraordinarily high. This leaves humans in the situation of having to live under extreme uncertainty — an uncertainty, for some, relieved by

**Pope Innocent VIII** (1432 – 1492), was Pope from 29 August 1484 to his death in 1492.. Shortly after his coronation Innocent VIII summoned Christendom to unite in a crusade against the infidels. On the request of German inquisitor Heinrich Kramer, Innocent VIII issued the papal bull *Summis desiderantes* (5 December 1484), which supported Kramer's investigations against magicians and witches:

*"It has recently come to our ears, not without great pain to us, that in some parts of upper Germany, [...] Mainz, Köln, Trier, Salzburg, and Bremen, many persons of both sexes, heedless of their own salvation and forsaking the catholic faith, give themselves over to devils male and female, and by their incantations, charms, and conjurings, and by other abominable superstitions and sortileges, offences, crimes, and misdeeds, ruin and cause to perish the offspring of women, the foal of animals, the products of the earth, the grapes of vines, and the fruits of trees, as well as men and women, cattle and flocks and herds and animals of every kind, vineyards also and orchards, meadows, pastures, harvests, grains and other fruits of the earth; that they afflict and torture with dire pains and anguish, both internal and external, these men, women, cattle, flocks, herds, and animals, and hinder men from begetting [...]"*

In 1487, Innocent confirmed Tomas de Torquemada as Grand Inquisitor of Spain. In the capacity of Grand Inquisitor Cardinal Torquemada executed his office with vigor until his death in 1498. In that year Torquemada’s reputation grew and even today his name is synonymous with the Spanish Inquisition’s horror, religious bigotry, and cruel fanaticism.



Pope Innocent VIII



inventing a set or sets of beliefs about a possible intelligent power. The natural human yearning for something transcendental is so great that it leads to the suspension of critical thinking in order to accept the religious beliefs that satisfy those transcendental needs.

This paper does not question the benefits that religious belief provides for many people. These benefits include the confidence that a higher justice will ultimately prevail, and the comfort of spiritual strength in times of stress — particularly when facing death. For some, religious belief represents a key, crucial ingredient for living a meaningful life. This does not mean, however, that religion is *realistic* . . . that is, based on any reality.

### **God Cannot Speak for Himself**

Why doesn't God reveal himself and speak to us directly? Why does he have to use people such as Jesus, people who can be described as middlemen or spokespersons? The reason God doesn't speak to us directly is that he can't, because he does not exist. Therefore, when we see comments supposedly from God, it would be proper to add the words "attributed to God." Some of those who claimed to speak for God, prominently Jesus, had the effrontery to claim to be related to God. God is the man behind the curtain. When the curtain is pulled back, however, it reveals that no one is behind the curtain. God exists only in the minds of his human creators who never witness the curtain being drawn back. Humans created God; God did not create humans. Since God does not exist, God did not create anything.

### **Religion is Tested by Science**

As Morton Hunt has said, "Real-world events interpreted as God's handiwork can almost always be explained in naturalistic or scientific terms. Indeed, from the 17<sup>th</sup> century on, as science provided ever more concrete and testable explanations of real-world events, many serious thinkers expected religion to wither away. But it did not. It survived by adaptation, more or less ceasing to offer supernatural explanations of whatever could be better explained by natural ones, and focusing instead on those phenomena that could neither be tested nor disproven, such as God's mercy, the existence of the soul, and the afterlife."

One such erroneous claim was made by the Christian church in 1484 when Pope Innocent VIII recognized the existence of witches and echoed popular sentiment by blaming them for the cold temperatures and resulting misfortunes plaguing Europe. Another was the condemnation of Galileo as a heretic in 1633 for his correct theory that the earth revolves around the sun — and did not formally clear him of heresy charges until 1992. If the Christian church can be so mistaken on such major matters this suggests it is likely to be mistaken on other significant issues.

Hunt continued, noting "Many believers still see the hand of God in certain remarkable, seemingly miraculous events, such as the survival and return to health of some adorable child, dying of inoperable cancer, for whom an entire town

prayed. Yet occurrences of miraculous events are almost never tested by being weighed against occurrences of comparable non-events. We read about the marvelous cure, but never about the many cases in which equally fervent prayer failed to save the lives of equally adorable children. Nobody remembers them, because we have a tendency toward 'confirmation bias,' as psychologists call it — we remember events that confirm our beliefs but forget those that do not." More plausible, but less pleasing inferences would be that the belief or prayers weren't strong enough, or the proposed beneficiary of prayer was not sufficiently meritorious for God to intervene.

Hunt further added, "This God sometimes suspends the natural laws he or she created in order to make some preferred worshipper's prayers come true. Believers refer to priests, or other special people who can mediate between them and the spirits or gods, and adopt acts of submissive ritual to placate and please those deities."

### **Religion is Tested by Reason**

In theory, the facts should speak for themselves. But in practice only a relatively small percentage of people are capable of accepting and integrating controversial facts that contradict deeply held beliefs and assumptions. It might be said that with regards to religious issues, deeply religious people suffer from a mental block about reality. They become closed to the input of new or differing information.

"Conventional wisdom" has always functioned more on belief rather than fact. For many, belief will always win out in an argument, because it requires no proof. By its very nature, belief remains largely immune to disproof. Although science clearly demonstrated the earth is round, the belief the earth was flat held sway for centuries. Those who threatened to upset the status quo by postulating a round earth were often jailed and tortured.

The closed mindset of religious people usually leads to frustrating and fruitless arguments with them concerning religion. Their intransigence may best be described by the phrase, "There are none so blind, as those who will not see." To turn a Christian phrase on its head, the mental and emotional state of the religious might be labeled "The Doctrine of Invincible Ignorance."

Again, the human need for the transcendental is so powerful that it leads to the suspension of critical thinking in order to accept the religious beliefs that satisfy those underlying transcendental needs. To paraphrase Norman Hammond, "Irrational certainty" is often more attractive to people than the "rational uncertainty of science."

H. L. Mencken has said, "In even its highest forms religion embraces concepts that run counter to all common sense. It can be defended only by making assumptions and adopting rules of logic that are never heard of in any other field of human thinking."

Psychologist Michael Shermer has written that, "Instead of shaping belief around painstakingly gathered, soberly judged evidence, people most often decide upon their beliefs

first, and then use an impressive range of cognitive tricks to bend whatever evidence they do discover into support for those pre-decided acts of faith.”

### Biology Plays a Part in Religious Belief

A fascinating aspect of religious belief, referred to previously, is one of “compartmentalization.” The religious appear to be no different in every other way from their non-religious peers. Early age indoctrination, wishful thinking, the desire for life after death, peer pressure, etc. together are not enough to explain the departure from reality that constitutes most religious belief. What remains after these stated explanations and justifications is biology.

There are almost certainly some chemical and/or biological aspects of the human brain that drive otherwise intelligent, educated individuals to abandon facts and reason in the acceptance of unfounded religious beliefs. It appears that religious belief is largely a product of brain physiology. Basically, some of us are just wired this way.

God is a mere perception generated by the human mind. That we can conceive of “God” does not mean that he or she exists. The God of the bible is nothing more than a neurochemical flash coursing through the synapses of the cerebral cortex.

It has been theorized that humans are “hard-wired” to believe in God. If this is true, then it must have been a virtue and provided some biological benefit — else the phenomenon would not have evolved. This, however, does not mean a proclivity for religious thought continues to be presently useful.

Two possible bases for natural selection favoring the survival of religiously-oriented individuals are:

1. **Sociological** — Religious individuals are attracted to other similarly-minded individuals. Membership in a group increases the individual’s chance for survival (as well as the survival of the individual’s genes).
2. **Biological** — The tendency towards religious belief may be correlated with other valuable traits (such as intelligence, self-confidence, or aggression) which in turn increase the chances for survival. Whether sociological or biological, religious tendency can be seen as an ingrained trait which could be passed on to subsequent

**We are a religious people whose institutions presuppose a Supreme Being.... We sponsor an attitude on the part of government that shows no partiality to any one group and that lets each flourish according to the zeal of its adherents and the appeal of its dogma.**



**William O. Douglas (1898 - 1980), longest serving Justice of the Supreme Court**

generations.

For those whose brains seem to be hard-wired on a “feeling” or emotional basis to accept belief in a higher power, this belief apparently can come with no obvious external stimuli. While for others, religious belief only comes, or is enhanced by, external stimuli such as prayer, drugs, meditation, or sleep deprivation.

Studies of twins have shown the inherited predisposition for holding religious beliefs. The proclivity towards religious thinking is genetically influenced to some degree.

According to a literal reading of the work of molecular biologist Dean Hamer, our most profound feeling of spirituality may be due to little more than an occasional shot of intoxicating brain chemicals

governed by our DNA. That chemistry is enhanced and reinforced through early-age indoctrination, and then harnessed by the power of groupthink.

Michael Persinger, a professor of neuroscience at Laurentian University in Sudbury, Ontario has said his research shows that “religion is a property of the brain, only the brain, and little to do with what’s out there.”

Studies have shown that not only does a person’s brain activity change in particular areas while undergoing religious epiphany, but such events can actually be artificially created and re-created for some people. The electrical and/or chemical stimulation of various parts of the brain can even cause *self-professed atheists* to experience perceived religious events.

Certain of the validity of their beliefs, but with no sound evidence to back up those beliefs, and unwilling to let go of their convictions, religious adherents grasp for support to substantiate their belief systems. This endeavor carries them into “suggestive” areas such as intelligent design, near-death experience, visions often incurred from drugs, intense prayer — and/or sleep, food, and light deprivation. None of these “suggestive” areas, however, provide any scientifically demonstrative links to the existence of a supreme being. The God of the bible is wholly and entirely a manifestation of human perception. God . . . is a myth.

Despite the lack of support for their beliefs, many religious adherents are quick to dismiss the well-supported record of biological evolution. They ignore mounds of hard science delved from painstaking research, quibbling instead over a missing link across a fossil record chain spanning millions of years. Others, usually with more education, accept

evolution but turn to spurious arguments, such as how God created our world and the universe in a basic form — and then casually and inexplicably stepped aside to allow natural forces, such as evolution, to take over.

### Missionaries

Religion teaches unsubstantiated beliefs as though they are facts. Many Christians who accept such beliefs as facts, i.e., certainties, therefore feel compelled to convey such beliefs to others. Such proselytizing, missionary-type efforts are usually motivated by kindness — wanting to share something they feel is wonderful and life-changing.



A Spanish missionary in the New World

Some believers, however, take more extreme measures and attempt to press their beliefs on others through the use of political influence. They engage the machinery of governmental institutions, churches, schools, and charitable organizations to force their views on others. An example of how a

deeply committed believer maintained an open mind — and resisted efforts to force his group's views on others — occurred during a theatrical performance that was presented on the campus of a major Catholic university. The performance expressed views contrary to Catholic belief. A bishop complained how this play deeply pained him. To paraphrase the response of the college president, "It is the purpose of a university to consider views which are contrary to currently accepted doctrine."

So . . . why the need for missionaries? An all-powerful god wouldn't need missionaries to spread the word of his existence. He wouldn't need intermediaries to communicate what he expects from humans. Yet without missionaries, especially Paul, an early Christian apostle, Christianity would not have come even remotely close to the number of adherents it has today. The inference is that Christianity is purely a human phenomenon. Religion was created by humans for humans and continues to be promulgated by humans. Religion is nothing more than a state of mind.

### History of Christianity

In the first centuries after Jesus there was no New Testament. However, the books of the Gospels, Acts, Epistles, and Apocalypses were widely read. These works were fervently followed by groups of early Christians. But many would not be among the books that formed the New Testament.

From the many different scriptures then available, Christians held beliefs that today would be considered bizarre — that there were two, 12, or even as many as 30 gods. And that a malicious deity, rather than a benevolent god, had created the world. Or that Jesus's death and resurrection had nothing to do with salvation. Still others insisted, with absolute conviction, how Jesus of Nazareth had never really died at all.

There was a struggle for orthodoxy — or right belief — amongst this cacophony of various early Christian groups. Certain Christian beliefs gained legitimacy, and others died off to become mere footnotes to history.

When Constantine became the first Christian head of the Roman Empire in the 4<sup>th</sup> century, the territories under his vast dominion were populated by a hodgepodge of beliefs and religions. Within Constantine's own young religion of Christianity there was also dissent, with one major question threatening to cleave the popular fledgling cult — as Christianity was at the time — into warring factions. *Was Jesus divine, and if so, how?*

In the 21<sup>st</sup> century it is hard to imagine riots in the streets, pamphlet wars, and vicious rhetoric spawned by such a philosophical question. But such was the nature of things in A.D. 325, when Constantine was forced to take action to quell the growing controversy.

That summer, 318 bishops from across the empire were invited to the Turkish town of Nicea where Constantine maintained a vacation house. The gathering was an attempt to find common ground on what historians now refer to as the Arian Controversy. This was to be the first ever worldwide gathering of the Christian Church. The Christianity we know today is a result of what those men agreed upon over that hot, sticky month some 1,700 years ago.

The compromise proffered by Constantine and his 4<sup>th</sup>-century conference was vague, but nevertheless blandly pleasing. Jesus and God were of the same "substance," the emperor suggested, without delving too much into the nature of that relationship. A majority of the bishops agreed on the compromise and voted to pass the language into church doctrine. Thus, the Trinity of God, Jesus, and the Holy Ghost became a tenet of Christianity by reason of a majority vote. There had been plenty of politicking, factionalism, and bitter infighting — which, of course, led to plenty of negotiated compromises. And, as one might expect, the end result was full of inherent contradictions. Their statement of compromise, which would come to be known as "The Nicene Creed," came to form the basis for Christian ideology.

After Jesus' death, early Christians shared accounts of his

life and teachings. Dozens of viewpoints were written down, but church fathers chose only four for inclusion in the New Testament. During the past century, many of the previously rejected and discarded gospels have been rediscovered. A few, such as the Gospel of Peter, parallel the chosen four. Others, such as the Gospel of Judas, differ strikingly. They emphasize *gnosis* — direct knowledge of God through awareness of the divine spark within.

A prominent scholar of religion, Elaine Pagels, was part of an international team of experts established to study and translate the texts from Nag Hammadi. This cache of scrolls found in Egypt in 1945 contained the writings by the Gnostics, a discovery considered as important as the more famous and widely known Dead Sea Scrolls. Pagels exploded the myth of the early Christian Church as a unified movement in her 1979 book, *The Gnostic Gospels*, an examination of the mystical beliefs of the Gnostic sect. Here was a book that argued that early Christianity contained a multitude of diverse interpretations and movements — or at least did so until the leaders of the orthodox church succeeded in suppressing many of these differing beliefs as heresies.

### Human Evolution and the Soul

Today, *Homo sapiens* is the only surviving human species. However, for much of pre-recorded human history, multiple hominid types shared the Earth. First there were *Orrorin* and *Toumari*, the two earliest hominids in the fossil record, which may have over-lapped in time. Both eventually yielded to *Australopithecus afarensis* — the Ethiopian desert's Lucy and her kin — from whom the *Homo* line arose. Toward the end of *A. afarensis*' reign and the beginning of *homo sapiens*' ascent, approximately two and a half million years ago, at least four hominid species coexisted.

Some of these hominids belonged to dead-end branches on the evolutionary tree, and were eventually sidelined by species that walked, talked, and exhibited more intra-group cooperation.

Why did God have to try so many times? Shouldn't an all-powerful being have succeeded on his or her first and only try? These different evolutionary branches, most of which died out, raise a profound theological question. When did God introduce the "soul" into the human race? And did he introduce it to members of a branch which subsequently died out, or did he withhold it from most branches knowing that they would not "be going the distance?"

### Some Inconsistencies and Illogical Thinking in Christianity

After going to all the trouble of making the universe, including Earth and its human inhabitants, it would seem plausible for God to have made himself known. Why leave it up to humans to make "half-baked" guesses as to his nature, the ultimate purpose of human life, the future of the universe, etc.?

If humans were God's top concern, as the bible says, why

did he go to the trouble of creating a universe with perhaps 1,000 billion or so stars?

A smart young boy once stated, "Why does God keep making new people? Why doesn't he just keep the ones he has?"

The bible says God created Adam and Eve, and that Adam and Eve had two sons. One son killed the other. Presumably this would have eventually led to the end of the human race. The bible sidesteps this issue by simply ignoring it.

Then we have the question of determinism versus free will. If humans have free will to make choices, including choices that will lead to their post-earthly fate (for all eternity no less), then God apparently is not all powerful as the bible claims. A possible reconciliation of this issue is that while humans do indeed have free will, God knows in advance how they will exercise that free will. This implies that God is "playing games" with people and is simply toying with his human creations. God's possible motive or motives for these machinations defy logic.

### More Inconsistencies and Illogical Thinking in Christianity

The supposed crucifixion is nonsensical. First, Adam and Eve damn the human race with "original sin." Later, Jesus comes along and frees the human race through the sacrifice of his life. Depending upon whether they were born before or after Jesus, people are either burdened with or freed of "original sin" — and with absolutely zero control over this condition. We can make sense of all this by understanding that as the circumstances under which people's lives change, so do their needs change. Under such shifting circumstances, it becomes useful for them to change gods and/or beliefs. This is only reasonable because God was created by humans to fulfill their human needs. God is a state of mind, a mere concept . . . and therefore God is changed as the human mind changes.

A crater as big as the state of Ohio has been discovered in Antarctica. Scientists think it was blasted out 250 million years ago by a space rock that caused the greatest mass extinction in Earth's history. Then, some 65 million years ago, another mass extinction killed off most of the planet's dinosaurs, the world's dominant life form for over 100 million years. Apparently, God did not initially get his handiwork right — but has apparently kept right on trying.

When Roman legions destroyed Carthage they took some 150,000 lives. Nazis (members of a modern Christian nation) murdered millions during WWII. Japanese WWII atrocities have been explicitly chronicled in the book *The Rape of Nanking*. Millions of animals died in recent Australian fires. A 2004 tsunami killed approximately 200,000 people along the coasts of Asia. Are these the works of a benevolent god worthy of human worship?

A strong drawing card for Christianity is the promise of eternal life under idyllic circumstances after the physical body has died — provided one has accepted the Redeemer.

Heaven seems to be a meeting place, after all is said and done . . . where more can be said and done and the point of existence is revealed. Apparently this earthly life is a rehearsal for an apparent imaginary life after death. It would seem that God would have allowed some departed souls to return to earth, confirming the existence of heaven to those of us still living, if indeed an actual heaven really existed. Since this has not happened, it would seem, as theologian James Stout has succinctly stated, “When you are dead, you are dead!” Christian doctrine profoundly disagrees with Mr. Stout despite being unable to provide any credible evidence to the contrary.

A practicing Catholic once commented, “If I had been raised Protestant I would be Protestant today.” This was an intelligent statement. An equally intelligent response might have been, “If you had been born 4,500 years ago in ancient Egypt, you would have been worshipping a plethora of pagan gods and have regarded the pharaoh as the heavenly representative on Earth — and to whom you owed your allegiance and obedience.”

Belief in God and many of the other tenets of the bible are unsubstantiated, wishful beliefs. In reality they are based on blind faith. For the religiously inclined, dropping the word “blind” and capitalizing “Faith” elevates them to a sacred, holy status.

In his book Why I Am Not a Christian, Bertrand Russell postulated a god that is evil. God leaves “good” as a means to test us. Those who live evil lives will prosper in the after-life. This is just as logical as the bible’s premise that good will eventually triumph.

The faithful raise the question, “Where else could this world, and the humans who inhabit it, have come from, if not from a god who has always existed?” It makes just as much sense to postulate that the basic building blocks of the world — mass, energy, space, and time — have always existed and were then modified by the forces of physics and evolution.

In attempting to explain the large number of varying faiths, it has been said that God speaks to people in different ways. God tailors his message in order to accommodate the varying abilities of humans to receive him. It seems hard to believe that people are so different that reaching them requires dozens (if not a hundred or more) of Protestant Christian faiths in the United States alone.

## Conclusion

Human beings, like other animals, find themselves in a world not made for them. Driven by an insatiable urge to understand the source and destiny of their existence, they created numerous gods . . . gods which later morphed into (for Christians) a single supreme being.

With alleged benefits of unconditional love, answering of prayers, forgiveness of sins, and eternal life after death, it is understandable why so many are attracted to Christianity. This is despite the complete absence of proof, of any sort, of the existence of this supreme being. Early age indoctrina-

tion, association with those of similar views, the suspension of rational judgment, and the bias of the human brain all contribute toward the unsubstantiated acceptance of religious belief — without the presence of any corroborating evidence.

A function of this yet unidentified part of the brain drives some people to abandon reason and accept a view of religion as reality — despite the lack of reasonable support for such a view. Such an outlook is compartmentalized, that is, limited to religion. This type of religious thought process is analogous to how most men are attracted to women with curvy figures — it’s biology! But while most men would certainly tend to realize, and admit, to the role biology plays in their attraction to curvy women, religious folk seem totally unaware of the way in which biology drives their perception of religion . . . and if informed of this direct causality would vigorously deny it. This gives new meaning to a phrase used within Christian academia — “The Doctrine of Invincible Ignorance.” It also raises the profound question as to whether people with such a biological religious bias are able to hold forth, in an intelligent and unbiased manner, on theology.

It seems likely that, in time, medical research will identify the area in the brain or the gene/brain connection which creates the powerful proclivity toward religious belief. Hopefully, such research will lead to a non-invasive test that will enable identification of individuals so affected. This opens the possibility for a “1984” scenario . . . one in which manipulation presses humans toward belief in God — or, just the opposite, toward the absence of belief in God. If God is nothing more than a neurochemical flash in the human brain, then this could lead to God (or, more accurately *the belief* in God) ceasing to exist.

In closing, the French historian and philosopher Voltaire once said, “**If God did not exist, it would be necessary to invent him.**” This is precisely — and undoubtedly — what has occurred over the history of mankind.

**Norman Vadner** holds degrees in management from the Massachusetts Institute of Technology and Columbia University.

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Editor’s note: See the Special Edition of Phactum addressing the topic of Free Will, **THE PHYSICS OF FREE WILL** by A. Granville Fonda, published December 2010. <http://phact.org/data/special/Phactum%20Special%20Edition%20-%20The%20Physics%20of%20Free%20Will.pdf>



# The Many Exodi of Mankind

by Paul Schlueter III

It has been a busy year for paleontology. With more archaeologists than ever before, digging up bones and artifacts in more places, science has begun to fill in the wide open spaces between evidence-based conclusions about our collective prehistory.

The past year has not offered astounding new finds on a par with the discovery of the *Ardipithecus* hominids, but a variety of small finds and new analysis of old finds have presented us with a paradigm shift in our understanding of how humankind came to inhabit almost the entire world, from its humble beginnings in East Africa.

In the oversimplification we often employ, it has been believed by most of society that people moved in a big, invasive mass, spreading across the planet in just one gigantic wave. The truth is far more complex. Hominids left Africa more than once, and it was a pre-human period of emigration which brought (probably) *Homo erectus* into Asia and Europe before they there evolved into *Homo Neanderthalensis*. Neanderthal never existed in sub-Saharan Africa, and its genetic marks in human DNA are present in every modern human group EXCEPT those who never left the African continent. Neanderthal were present in Asia and Europe when *Homo sapiens* eventually began showing up, and during the relatively short period when our species co-existed, we inter-

bred.

The Ust'-Ishim Man is known from a single thigh bone, found in Siberia in 2008 by a fossil collector searching for mammoth tusks. Nicolai Peristov was travelling the Irtysh River there when he spied the single bone, poking out from mud. Via the Russian Academy of Sciences, specimens from that bone found their way to Svante Pääbo, the eminent DNA specialist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. He found that the bone was 45,000 years old, smack in the middle of the period when humans and Neanderthals co-existed in Europe. A comparison of that one bone's DNA with both human and Neanderthal DNA indicates that the "common ancestor" lived around 60 Kya. Ust'-Ishim's thigh bone is the oldest human remain ever found outside Africa or the Near East, and his Neanderthal component is the least-disrupted example ever found. Over the passage of each generation, the DNA clusters of our heritage become progressively "broken up" because of the random fragmentation of chromosomes during the production of sperm (they become more fragmented as a man ages). Eggs (which are all created at the same time during a woman's own gestation, remaining dormant throughout her life until released during ovulation) are less susceptible to further mutation during one woman's lifetime.

We used to think that humans and Neanderthals interbred between about 86 Kya and 37 Kya; thanks to Ust'-Ishim, that window has been narrowed to between 60 and 50 Kya.

Other research has indicated that human remains in India and the Near East are closer to 100K years old; it now appears that they are from an earlier migratory wave, which died out without leaving modern descendants. Ust'-Ishim was more like non-Africans than Africans, yet "no more closely related to Europeans than he was to East Asians," says Harvard geneticist David Reich. Yet, his DNA survives in both regions today, indicating that all the non-Africans now remaining are descended from the same genetic group as Ust'-Ishim, and not from earlier waves of human expansion. That puts our particular exodus (of several) from Africa somewhere between 60 and 45 Kya (after humans interbred with Neanderthals, but before Ust'-Ishim Man). The window will certainly change, as we learn more.

Speaking of East Asians, it turns out that the genetic



**Shin bone of Ust'-Ishim Man**

group we know as Denisovans (from just a couple small skeletal fragments found in Denisova cave, also in Siberia) was quite widespread. We already knew that Denisovan DNA can still be found in modern Southeast Asians, especially those in the Pacific Islands. However, a report in the July 2 issue of *Nature* declared that their heritage is also linked to the ability of Tibetans to better process oxygen at high altitudes. The EPAS1 variant helps Tibetans cope with oxygen 40% lower than at sea level. An analysis comparing a stretch of DNA 32,700 letters long (including the region that defines EPAS1) in both 40 Tibetans and 40 Han Chinese (close relatives of Tibetans) shows the Tibetans to be unique, and their version of EPAS1 is not inherited from Neanderthal. It is also absent in every other surviving human group. However, when the 41K-year-old Denisovan genome became available, researchers found their link! Denisovans shared 15 of the 20 Tibetan distinctions (called SNPs, or single changes in DNA "letters"). It is still unknown where or why Denisovans acquired the high-altitude adaptation, and it was most likely the result of a random set of mutations lacking any specific "purpose" at all, but clearly those SNPs have helped Tibetans to survive in their adopted homeland, far better than humans from any other genetic group have done. It appears to be a case of the adaptation proceeding its own need, but later finding the perfect niche for itself within the many available environments of our habitat.

Siberians have lots of interesting stories to offer paleontology. It now turns out that there were at least two waves of Siberian relocation into North America's arctic region, as well, neither of which contributed to the genetic heritage of other Native Americans living today.

The Dorset culture appeared around 5 Kya, and died out around 1 Kya. At around 1 Kya, the Dorsets were replaced by the Thule, who are the ancestors of modern Inuits in both Greenland and Canada. Both groups had a common founding population back in Siberia. Native Americans also descended from Siberians, but they apparently migrated into this continent at least 12 Kya, without settling the Arctic.

Dorset and Thule cultures apparently co-existed for at least 150 years in the icy North, according to reports in the August 29 issue of *Science*. The Thule had bows-and-arrows, and apparently had well-organized communities; this appears to have squeezed out the Dorsets, who lacked those cultural adaptations. The Sadlermuit culture, which died off from European disease on two islands of Canada's Hudson Bay in around 1903, proved to have only modern Inuit DNA, with no evident descent from Dorsets. Also, a lack of Scandinavian DNA in ancient Thule samples argues against interbreeding with the Viking culture on Greenland/Newfoundland during their exploratory travels around 1 Kya. However, samples from the armbone of a Siberian boy who lived around 24 Kya indicate that his DNA group was the common source group of both the Dorsets and the Thules, and also of modern Native Americans.

A report in the July 14 issue of the *Proceedings of the National Academy of Sciences* has moved back the date for



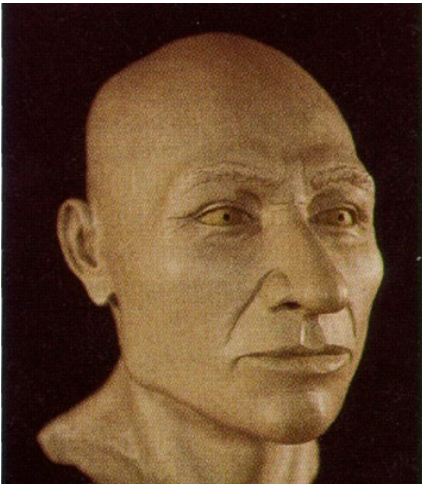
**From left to right: mastodon, mammoth, gomphotherium. The gomphotherium was about the size of the modern elephant. They roamed parts of North America as recently as about 13 Kya.**

the presence of Clovis people, and shows that they were present much further south than previously known. At a site in the Sonoran Desert of Mexico called El Fin del Mundo (the end of the world), classic Clovis spearpoints show up at a campsite where hunters brought down gomphotheres (an extinct, elephant-like megafauna, smaller than mammoths or mastodons) 13,390 years ago. Four spearpoints were found among the bones of two of these animals, comprising the only evidence that Clovis people hunted that particular critter. One other Clovis site (in Aubrey, Texas) is close to the same age as the Sonoran site. That Clovis people hunted all three related species (mammoths, mastodons, and gomphotheres) may indicate that their behaviors were similar enough to be attractive to this specialized culture as a prey animal. Presumably, similar hunting techniques were used for each species, along with the same sort of stone weapon points.

Clovis culture peaked between 13 Kya and 12.6 Kya, and it appears that Clovis people were among the ancestors of modern Native Americans.

On the other hand, it is now "official" that the Kennewick Man was NOT related to modern Native Americans. In 1996, two college students found bones while wading along the banks of the Columbia River near Kennewick, WA. They called police, who in turn called a coroner, who in his own turn called James Chatters, a local archaeologist. A search revealed nearly an entire skeleton, with part of a (non-Clovis) stone spearpoint imbedded in one hip. Carbon dating showed the remains to be over 9,000 years old.

The site was then under the control of the Army Corps of Engineers, who had practical (legal) reason to be particularly sensitive to the interests of local Native American groups. A coalition of NA tribes laid claim to the remains under NAG-PRA, a federal law which seeks to repatriate NA remains to related tribes for culturally-proper disposition, rather than allowing the remains to sit in museum collections indefinitely. In a lawsuit which ended up costing taxpayers an estimated \$5 Million, the Corps tried to keep Kennewick Man away from scientific researchers, while the science commu-



**Kennewick Man c. 7,000 BC**



**Starship Captain c. 3,000 AD**

nity sought to examine "one of a handful of nearly-complete skeletal remains of ancient Americans." In 2004, the 9th Circuit Court of Appeals ruled that the Kennewick Man does not share genetic or cultural features with living NA tribes, so NAGPRA does not apply to his remains. Though the Corps retains custody of the remains, it was essentially forced to grant scientists the opportunity to study them, which took place in July '05 and February '06 (a total of 16 days of access).

Scientists have concluded that Kennewick belonged to America's earliest settler group, seafarers who share a common ancestor with Polynesians (who did not yet exist when Kennewick died in Washington), and with the distinctive culture known as the Ainu people of Japan. Kennewick's culture is called the Jōmon culture, which appears to have spread to the Americas around frozen coastlines, from Japan (then land-connected) across Beringia, to Alaska and beyond. Kennewick did not actually grow up in Washington, evidence suggests, but appears to have been a seal hunter from the Alaskan region, perhaps trading in the region where he died. His DNA has not successfully been analyzed (and the Corps is not permitting further sampling at this time), but he is physiologically distinct from modern NA peoples. His closest relatives (today) seem to be the Moriori people of the Chatham Islands, 420 mi. SE of New Zealand! While science begs for further access to this unique individual's remains, the Corps stands firmly in the way; they've even gone so far as to dump a million pounds of rock and fill over the site where the remains were discovered, apparently to prevent further examination of its stratigraphy and the search for possible grave goods at the burial site! A fascinating article on the entire story appeared in the September 2014 issue of Smithsonian magazine.

Also, several sources have reported on the recent discovery of 13K- year-old remains of a teenage girl, found in an underwater cave in Mexico. Her features suggest relationship with the Kennewick Man, yet her DNA indicates that she is also related to early Native Americans on the maternal side.

Without Kennewick DNA, we're unlikely to clarify the relationship he may have had to his elder cousin.

The Jōmon people seem to have paddled their way to America first (shown to be possible by modern kayaker John Turk, in '99 and '00, by actually making a comparable trip), along what is now called the "Kelp Highway." A later wave of immigration brought the ancestors of Native Americans, probably in more than one group, possibly over many hundreds of years both before and after the last Ice Age. Though we don't know how long Jōmon people lived in the Americas, Kennewick's immediate family resided in the Northwest region between the arrival of NAs, and the arrival of the Dorsets or the Thules. It is still difficult to pin down exactly how many waves of migration into the Americas took place, especially for those groups which left no living descendants here; the best guess is "many waves."

In 1973, John Adovasio (University of Pittsburgh) began excavations at the Meadowcroft rock shelter, in western PA. Among the artifacts found there were a three-inch spearpoint (named the Miller point) and a two-inch knife (named the Mungai knife). Both lacked the distinctive central "fluting" (a long, concave groove into which a wooden haft could be bound) of classic Clovis points. Not only does this absence suggest a pre-Clovis origin, but carbon dating of campfire charcoal at the site has been dated to 16 Kya.

In a Chilean site known as Monte Verde (more precisely, near a town called Maulin, along the Chinchihuapi Creek), stone tools and animal bones were dated to 13.8 Kya, and later verified by other studies.

More astonishing are finds BENEATH those layers. By simply digging deeper at the Monte Verde site, archaeologists discovered stone tools associated with campfire charcoal which was dated to 33,730 years ago! Another hearth in the same layer came back dated to between 33 and 40 Kya! The original article on this discovery was by T. Dillehay and M. B. Collins, in *Nature* 332 (1988), p. 150.

Recent finds, reported in the September *Antiquity*, by Eric Boeda from the Universite Paris Oest Nanterre La Defense, comprise 294 stones which (upon microscopic analysis) "indicate that humans had sharpened the rocks." Associated "burned wood" yields a carbon date of 24 Kya, with a nearby site yielding a date of 15 Kya. This study was mentioned in the 10/18/14 *Science News*. The site of these finds was in Brazil, the opposite side of South America as Chile.

There is substantial resistance to the proposal that pre-Clovis people inhabited the Americas, yet with stone tools dating tens of thousands of years earlier turning up in South America, one certainly has to entertain the possibility. No human remains have been found near those super-ancient finds, so DNA analysis and physiological comparisons haven't been possible. I'll leave it to others to wildly speculate about who could have been making stone tools so long ago in the "undiscovered" New World, but it's entirely possible that a much earlier migration into the Americas simply died out.



We know from the failure of a few of the earliest European attempts to settle this continent that it can be a difficult thing to establish a new colony in a strange place.

In '06, spelunkers found two men in a cave in Spain's Cantabrian mountains. La Braña 1 and La Braña 2 were both 30 to 40 when they died, and they were apparently deposited in the cave on purpose after their deaths, roughly 7 Kya. It's not certain if this qualifies as "a burial" or not. DNA from one was analyzed, and reported in the January issue of Nature.



**La Brana 1 (c. 5,000 BC) may have looked like this artistic reconstruction. He is known to have dark skin and is thought to be blue-eyed.**

According to Science News (5/17/14, p. 27), modern humans reached Europe 40 Kya, displacing Neanderthals by 30 Kya. Between 25 Kya and around 11.7 Kya, a glacier barred humans from Scandinavia and Britain. About 11 Kya, agriculture began to spread in the Mediterranean, arriving from the Middle East. At least 4 distinct cultures co-existed in Europe, starting around 8 Kya, initially as hunter-gatherers, all persisting to today in the regional genome. Through the Neolithic (7.5 - 4.2 Kya) and the Copper and Bronze ages (5.5 - 3.5

Kya), farmers overwhelmed hunter-gatherers, mostly maintaining separate technologies and interbreeding very little, if at all. Between 7.5 and 6.7 Kya, hunter-gatherers very nearly died out, but recovered as a group at around the time Stonehenge was built (5 Kya). In '08, the Tyrolean Ice Man, Ötzi, got his DNA read, and it turned out that his 5,300-year-old remains have no maternal ancestry among modern Europeans. However, he had paternal links to Sardinians and Corsicans, a region 500 km to the southwest of his mountain resting place. While there seems to have been much greater tendency for Europeans to wander broadly in the distant past, during their recent history they have tended to remain put, and genetic maps of some regions closely mirror modern political and geographic maps. At some point during the



**Ötzi, the Tyrolean Ice Man c. 3,300 BC - discovered by German hikers in 1991**

Middle ages, Europeans decided to stay near their birthplaces, and to minimize interaction with their neighbors. Three ancient groups seem to form the root of European genetics; Early European farmers, Western European hunter-gatherers, and "ancient North Eurasians."

The 24K-year-old Siberian boy, Mal'ta-1, was buried near Lake Baikal, and he is "genetically unlike any living group of people today," though his genetic profile resembles both western Europeans and Native Americans; both groups got DNA from Mal'ta-1's people. For NAs, it's about a third of their genome, and for Europeans, it's about 20%.

As we learn more, the scenario becomes ever more complex. The more blanks we fill in with ancient bones and DNA testing, the more fascinating everyone's story becomes. To truly trace the complex pathways of ancient human migrations, we would need the full genetic fingerprint of everyone left alive today, plus the genomes of as many extinct branches of humanity as we can locate, because it is those ancient clues which guide us to understanding how some of our more mysterious traits originated. As the technology makes DNA testing ever easier (and cheaper), we'll approach the goal of obtaining that data. As computer speed/memory continues to grow, analysis will show our links more and more clearly. Hang on tightly; the next five years will surely bring many more surprises in who we are, and where we came from!



**Paul Schlueter III** is serving Life in Prison in NE Pennsylvania. His supporters have created a website about him.  
[www.jaybird.org](http://www.jaybird.org)

# PHACT CALENDAR

## PhACT Events

**Dr. David Cattell, Chairman of the Physics Department of Community College of Philadelphia** hosts meetings of PhACT - at 2:00 PM on the third Saturday of most months at Community College of Philadelphia.., Parking is easily available on the free parking lot on 17th street on the left hand side before Callowhill Street. It opens at 1:00 PM and closes at 6:00 PM. 17th Street is one way south bound. This meeting site is handicap accessible. **PhACT Meetings are Free and open to the public unless otherwise noted.**



**Saturday, January 17, 2015 at 2:00 PM - LECTURE**  
**Eric Krieg will discuss "The high cost of Free Energy"**

**Saturday, February 21, 2015 at 2:00 PM - LECTURE**  
**Professor Alan Mann will discuss "The Scars of Evolution"**

**Saturday, March 21, 2015 at 2:00 PM - LECTURE**  
**Dr. Deborah Berebichez will discuss "A Non-Stop Skeptic in a Believer's World"**

**April 2015 - PhACT / Philadelphia Science Fair Lecture**  
**Date and Location TBA**  
**Toxicologist Dr. David Cragin and Science Journalist Faye Flam will discuss the controversy of Genetically Modified Organisms (GMO).**

**Saturday, May 16, 2015 at 10:00 AM - PhACT Expedition to the Mullica River to search for the Jersey Devil.**

**September 19, 2015 at 2:00 PM - Lecture**  
**Professor Paul Halpern will discuss his new book *Einstein's Dice and Schrödinger's Cat: How Two Great Minds Battled Quantum Randomness to Create a Unified Theory of Physics***

The **PhACT Calendar** is open to members and non-members 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](mailto: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. Phactum does not accept paid advertising.



**The Philadelphia Area Center for the History of Science (PACHS)** maintains an extensive calendar of events about the history of science, technology and medicine that may contain some interesting events not listed in the Phactum Calendar. Check out their website at:

<http://www.pachs.net/events>

**Monday, January 12, 2015 at 6:00 p.m at National Mechanics, 22 S. Third Street, Philadelphia, PA 19106**

#### Science on Tap

A monthly gathering that features a brief, informal presentation by a scientist or other expert followed by lively conversation. Good food and beer.

Must be 21 or accompanied by parent. Free and open to the Public.

<http://scienceontaphilly.com/>

**Wednesday, January 14, 2015 at 7:15 PM at the Fels Planetarium, The Franklin Institute, 222 North 20th Street, Philadelphia, PA 19103**

#### The Rittenhouse Astronomical Society

Astronomy lecture open to the General Public. See website for more details:

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

**Wednesday, January 14, 2015 at 7:00 PM at Frankford Hall on Frankford Avenue just north of Girard Avenue.**

#### Philadelphia Nerd Nite ... be there and be square, yo.

**Science discussions, good food, good company, and plenty of beer!**

For more information see the website at

<http://philadelphia.nerdnite.com/updates/>

Open to the Public. Admission \$5.00

Email us at: [nerdnitephilly@gmail.com](mailto:nerdnitephilly@gmail.com)

**Monday, January 19, 2015 at 6:00 PM-7:00 PM at the Academy of Natural Sciences at National Mechanics, 22 S. Third Street, Philadelphia, PA 19106.**

At this edition of **Tapping our Watershed**, Christopher Crockett, Deputy Commissioner of Planning and Environmental Services

Philadelphia Water Department, presents

**"Green Cities, Clean Waters: What's Been Achieved and What's to Come in the Future."**

<http://www.ansp.org/get-involved/cep/tapping-our-watershed/>

## PhACT Lecture

**January 17, 2015 at 2:00 PM**

**Eric Krieg will discuss "The high cost of Free Energy"**

**Tuesday, January 20, 2015 at 6:00 PM - PENN SCIENCE CAFÉ at World Cafe Live, 3025 Walnut St.**

<http://www.upenn.edu/pennnews/sciencecafe>  
**Johannes Eichstaedt, graduate student, Department of Psychology Founding Research Science, World Well-Being Project**

#### "Predicting Heart Disease With Twitter"

Social media represents an unprecedented opportunity for psychology researchers, providing a wide window into people's thoughts and feelings as they share them with the world. An interdisciplinary team has analyzed public Twitter streams, correlating them with geographic health data, showing that the emotional language that people use is a better overall predictor of heart disease than traditional metrics, such as smoking or obesity rates. Free and Open to the Public.

**Wednesday, January 21, 2015 at 6:00 PM at Saint Declan's Well, 3131 Walnut St. Philadelphia, PA, at 6:00 pm.**

<http://www.lrsm.upenn.edu/events/sciencecafes/index.html>

Laboratory for Research on the Structure of Matter

#### Grains of Physics

Doug Durian, Physics, University of Pennsylvania

Sand is a problem. At the beach it's fun to scoop and pour, and to make sandcastles. But it's hard to walk on and it sticks everywhere, plus those sandcastles start crumbling right away. The beach can turn to quicksand, and sandy bluffs

can collapse in avalanches. Similar problems arise in desert, lunar, and Martian environments. Industries struggle with processing food grains, pharmaceutical powders, minerals for making ceramics and concrete, as well as with coal and geologic formations holding oil and gas. In short, we need to deal with granular materials to secure our food, medicine, shelter, and energy. Unfortunately, lots of things still go wrong. At a basic level, we lack a good understanding of how "sand" either flows or jams up under applied forces. This is a mechanics problem, and it is difficult because unexpected behaviors emerge for large collections of even the simplest objects like grains. I'll survey this background, explain why physicists have latched onto "sand" as a cutting-edge research topic, and describe some research from my own laboratory on impact cratering and intermittent avalanche flows. Free and Open to the Public.

**Wednesday, January 21, 2015 at 6:00 PM at College of Physicians of Philadelphia, 19 South Twenty-Second Street, Philadelphia, PA 19103, (215) 563-3737 x304**

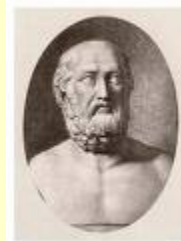
[http://www.collphyphil.org/prog\\_calendar.htm](http://www.collphyphil.org/prog_calendar.htm)

Pre-registration for all programs and events is strongly urged. For further information regarding events and registration, please e-mail [info@collegeofphysicians.org](mailto:info@collegeofphysicians.org) or call 215-399-2341.

#### Frankenstein by Josh L. Hitchens

A strange and terrifying story will be confessed to the brave few who risk an evening with a mysterious, tortured creature and its famed creator. Views of the Museum Gallery and the rarely seen Mitchell Ballroom will transport audience members as they accompany host Josh Hitchens in his many forms throughout this site-specific production of Mary Shelley's Frankenstein. Robert D. Hicks, PhD (Director of the Mütter Museum and the Historical Medical Library, and the William Maul Measey Chair for the History of Medicine) will delight curious participants with his elucidation of the science of electromagnetism. His insights will be delivered through the spectacle of illuminated projection! Join us for this exclusive tour of sights and

**SOCRATES CAFE** is moderated by: Lewis Mifsud, Ph.D., P.E., a member of PhACT and of The American Academy of Forensic Sciences. At 7:00 PM every Monday evening except holidays (on Tuesdays after a Monday holiday) at the Springfield Township Public Library (215-836-5300) at 1600 Papermill Mill Road, Wyndmoor, PA. 19038. This philosophical discussion group is free and open to the public. Join us and share your critical thinking, questions and opinions.



scenes you've read of, but never expect to see.

Museum admission on January 21st is included with the purchase of each Frankenstein ticket. The Museum will be open from 10am-5pm & again exclusively for ticket holders from 5:30pm-6:00pm.

\*Note: Audience members will be mobile as the production moves between 4 different spaces in the building. There will be 2 periods of time of about 10-15 minutes each during which very minimal seating will be available during the performance.

Josh Hitchens is a Philadelphia-based director, actor, and playwright specializing in classic and contemporary tales of horror. Since 2011 he has performed one man shows including Stoker's Dracula, A Christmas Carol: A Ghost Story, and The Legend of Sleepy Hollow. Hitchens is a current resident director at BrainSpunk and Creative Director of the Victorian Theatre program at the historic Ebenezer Maxwell Mansion.

**Friday, January 23, 2015 at 10:00am at Laurel Hill Cemetery**, 3822 Ridge Avenue, Philadelphia, PA19132. 215-228-8200  
<http://www.thelaurelhillemetery.org>  
**MONTHLY FOURTH FRIDAY TOUR: HOT SPOTS AND STORIED PLOTS**

In life and in death, we all have stories to tell and what better place to hear tales of wonder than Philadelphia's most famous home of the dead? Join Laurel Hill Cemetery for an informative overview of Laurel Hill's long and colorful history, which will include many of the marble masterpieces, stunning views and legendary stories that afford the cemetery its WOW factor. This is the perfect tour for first-time visitors to Laurel Hill, and anyone else who enjoys beautiful art, scenic nature and fascinating history. "Hot Spots and Storied Plots" will be presented monthly as part of Laurel Hill Cemetery's Fourth Friday tour series, which take place on the fourth Friday of every month at 10:00am.

January's walking tour will take place on, departing from Laurel Hill Cemetery's Gatehouse entrance at 3822 Ridge Avenue, Philadelphia, PA 19132. Free parking is located in the lot across the street from the Gatehouse. The cost is \$8/person general admission; \$5/

members. Tickets can be purchased at the door,

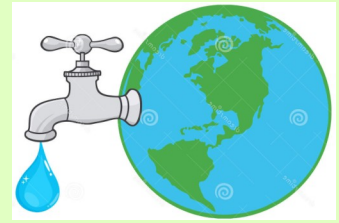
In November 2002, the existence of a

## Tapping Our Watershed—The Academy of Natural Sciences

The Academy's environmental programs focus on a variety of critical topics, including watershed science, environmental policy, and sustainability.

Join the Academy of Natural Sciences of Drexel University for Tapping our Watershed, a monthly science café in Philadelphia that brings lovers of water science together for conversations with top experts in the field. Formerly known as the Delaware River Watershed Initiative Seminar Series, these talks are sophisticated enough for the experienced scientist but formatted for the casual guest who is interested in tapping into watershed issues on a deeper level. You can expect to hear engaging talks ranging from water policy and management to indicator species and pollutants, with a stimulating Q&A to follow each presentation.

Tapping our Watershed is held the **third Monday of the month at National Mechanics at 6 p.m.** The talks are intended for individuals 21 or older, but those under 21 can come with a chaperone who is at least 25. Tapping our Watershed is sponsored by the William Penn Foundation.



or in advance by phone (215) 228-8200 or online.

**Monday January 26, 2015 at 7:00 PM** at MaGerks Pub and Grill, 582 South Bethlehem Pike, Fort Washington, Pennsylvania 19034.  
**American Revolution Round Table of Philadelphia**, <http://arrtop.com/>  
Program to be announced. Check website.

**Tuesday, January 27, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: "Before Leonardo: Using Science to Discover Italy's First Oil Painters"**  
Free and Open to the Public

**Sunday, February 1, 2015 at 2:00 pm** at University of Pennsylvania Museum, 3260 South Street, Philadelphia, PA 19104  
<http://www.penn.museum/events-calendar>  
**Afternoon Lecture**  
**Ossuaries and the Burials of Jesus and James**

sensational archaeological artifact was announced to the world—a small stone box called an ossuary, inscribed with the name of James, the brother of Jesus. And in spring 2007, yet another sensational claim made headlines around the world—the supposed identification of Jesus' family tomb in Jerusalem's Talpiyot neighborhood. In this illustrated lecture, Dr. Jodi Magness, Professor of Religious Studies, UNC Chapel Hill, discusses these finds within the context of ancient Jewish tombs and burial customs in Jerusalem in the time of Jesus (late Second Temple Period). Dr. Magness explains why the so-called Talpiyot tomb could not have belonged to Jesus' family, and the so-called James Ossuary never contained the remains of Jesus' brother James the Just. Cosponsored by the Archaeological Institute of America. Free with Museum admission. For more information, call 215.898.2680.

**Monday, February 2, 2015 at 7p.m** at Commonwealth Chateau, Chestnut Hill College, 9230 Germantown Avenue, Philadelphia, PA 19118  
The Institute for Science and Religion  
**The Free Will Problem: Insights from Physics**  
**Elliott Tammara, PhD, Assistant Professor of Physics, Chestnut Hill College** <http://www.irands.org>

Free and Open to the Public. A free will donation is requested.

**Tuesday, February 3, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Deanna Day**  
Free and Open to the Public

**Tuesday, February 3, 2015 at- 6:00pm - 7:00pm** at Eastern State Penitentiary, 2027 Fairmount Avenue, Philadelphia, PA 19130  
phone: (215) 236-3300

**at Eastern State Penitentiary, 2027 Fairmount Avenue Philadelphia, PA 19130**

**Phone: (215) 236-3300**



**The Searchlight Series: Conversations About Crime, Justice, and the American Prison System**

Eastern State Penitentiary Historic Site partners with nationally recognized penologists and educators to present an ongoing discussion series about crime, justice, and the American prison system. The Searchlight Series discussions take place the first Tuesday of every month, free and open to the public. No reservations required. See website at:

<http://www.easternstate.org/searchlight-series>

<http://www.easternstate.org/home> **The Searchlight Series: April 2015**

**The Searchlight Series: Conversations About Crime, Justice, and the American Prison System**

Discussion Topic TBA. See website for details. Free and Open to the Public. Reception to follow.

**Tuesday, February 3, 2015 at 6:00 PM - PENN LIGHTBULB CAFÉ at World Cafe Live, 3025 Walnut St., Philadelphia**

<http://www.upenn.edu/pennnews/sciencecafe>  
**Meredith Tammings, assistant professor in the Department of Linguistics of the School of Arts & Sciences at Penn**  
**"Talk Like a Philadelphian"**

Philadelphians have a unique way of speaking that extends far beyond "youse", "jawn" and "wit wiz or without?" Drawing on 40 years of intensive research conducted at Penn on the Philadelphia accent, Professor Tammings will play recordings of speech of typical Philadelphians, identifying the words and sounds that make "Philly speak" unique. She will cover some basic principles of how speech sounds are produced and measured, as well as discuss how and why accents develop over time. Free and Open to the Public.

**Tuesday, February 3, 2015 at 7:00 PM at Washington Memorial Chapel, on Route 23 in Valley Forge.**

Friends of Valley Forge Park  
**The Battle of Crooked Billet**

Scott Randolph, the director and producer of the award-winning film "The Battle of the Crooked Billet," discusses this little-known Bucks County battle.

<http://www.friendsofvalleyforge.org/speaker-series.shtml>

Free and Open to the Public.

**Sunday, February 4, 2015 at 2:00 pm at University of Pennsylvania Museum, 3260 South Street, Philadelphia, PA 19104**

<http://www.penn.museum/events-calendar>  
**Afternoon Lecture**

**Great Wonders Lecture Series**

**Chichen Itza: An Alien City in the Maya Lowlands**

**Simon Martin, Associate Curator and Keeper of Collections, American Section**

Every spring and autumn equinox thousands of people gather at the base of "El Castillo"—the pyramid at the heart of one of the ancient America's most famous and evocative cities: Chichen Itza. They come to marvel at the skill of ancient astronomers in aligning their structure in such a way that the sun casts a diamond-back shadow of a giant serpent down one of its staircases. They also come to peer into the depths of the great sinkhole known as the "Well of Sacrifice," and wander through the expanses of the "Great Ballcourt," the largest in the New World. Chichen Itza is a truly remarkable place, but the story behind it has hardly been told. There is a hidden history to these ruins and the biggest secret of all is that this great Maya

metropolis is not very Maya at all. To understand the city properly it will be necessary to debunk the myths and take a journey into the symbolism behind its every carved stone—revealing its true designers and their ancient purpose.

Lecture with advance payment

\$5 General Admission

\$2 Penn Museum Members

\$10 At-the-door

For more information, call 215.898.2680. To register, visit [www.penn.museum/greatwonders](http://www.penn.museum/greatwonders).

**Wednesday, February 4, 2015 at 7:00 PM at Frankford Hall on Frankford Avenue just north of Girard Avenue.**

**Philadelphia Nerd Nite ... be there and be square, yo.**

**Science discussions, good food, good company, and plenty of beer!**

For more information see the website at

<http://philadelphia.nerdnite.com/updates/>

Open to the Public. Admission \$5.00

Email us at: [nerdnitephilly@gmail.com](mailto:nerdnitephilly@gmail.com)

**Saturday, February 7, 2015 at 1:00 PM at Laurel Hill Cemetery, 3822 Ridge Avenue, Philadelphia, PA19132. 215-228-8200**

<http://www.thelaurelhillemetery.org>

**TRANSPLANTED SOULS:**

**ANOTHER TRY AT ETERNAL REST**

It's Philadelphia 2015, where do your ancestors rest? Over a century's worth of city expansion stretching industrial and residential limits has made that a hard question to answer. Ground once reserved as places for the dead became prime real estate for urban growth making the phrase "rest in peace" a relative sentiment at best.

Join us for a fascinating afternoon as we identify the sites of citizens who have been moved from their original burial places to a second (and sometimes a third) try at eternal rest at Laurel Hill Cemetery. Whether through reasons of celebrity and marketing, family ties, public health concerns, infrastructure improvements, urban development or mass transit projects; many of Laurel Hill's acquired already long dead denizens have arrived amid controversy, mystery and mayhem – issues that still arise today outside the haven that Laurel Hill provides

This walking tour will take place on Saturday, February 7 at 1:00pm, departing from Laurel Hill Cemetery's Gatehouse entrance at 3822 Ridge Avenue, Philadelphia, PA 19132. Free parking is located in the lot across the street from the Gatehouse.

The cost is \$12/person general admission; \$10/ students and seniors; \$9/members. Tickets can be purchased at the door, or in advance by phone (215) 228-8200 or online.

Guide: Nancy Wright

**Monday, February 9, 2015 at 6:00 p.m at National Mechanics, 22 S. Third Street, Philadelphia, PA 19106**

**Science on Tap**

A monthly gathering that features a brief, informal presentation by a scientist or other

expert followed by lively conversation. Good food and beer.

Must be 21 or accompanied by parent. Free and open to the Public.

<http://scienceontapphilly.com/>

Hosted by the Chemical Heritage Foundation

**Tuesday, February 10, 2015 at Noon at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106**

<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: "What Are the Historians Doing in the Laboratory?!"**

**The Methods and Methodology of Reconstructing BNF MS. FR. 640"**

Free and Open to the Public

**Wednesday, February 11, 2015 at 7:15 PM at the Fels Planetarium, The Franklin Institute, 222 North 20th Street,**

Philadelphia, PA 19103

**The Rittenhouse Astronomical Society**

Astronomy lecture open to the General Public.

See website for more details:

<http://>

[www.rittenhouseastronomicalsociety.org/](http://www.rittenhouseastronomicalsociety.org/)

**Thursday, February 12, 2015 at 10:00 AM at Laurel Hill Cemetery, 3822 Ridge Avenue, Philadelphia, PA19132. 215-228-8200**

<http://www.thelaurelhillemetery.org>

**LUNCHBOX LECTURE:**

**LAUREL HILL'S PRESIDENTIAL CONNECTIONS**

As the days grow shorter and the chill of the winter season settles upon us, Laurel Hill's 78 acres of enchanting landscape becomes increasingly difficult to traverse by foot. The Lunchbox Lecture series offers visitors the opportunity to tour and explore the Cemetery from the seated comfort of the warm indoors. Bring a bagged lunch and your sense of curiosity to the second lecture of this three-part winter series. In honor of Presidents' Day, this month's presentation will feature an inside look at the friends, foes and confidantes behind the scenes of America's highest office.

February's lecture will take place on Thursday, February 12 at 10:00am. The cost is \$8/person general admission. Tickets may be purchased in advance by phone (215) 228-8200 or online. Advanced reservations are requested and seating is limited.

Upon arrival, check in at Laurel Hill Cemetery's Gatehouse entrance at 3822 Ridge Avenue, Philadelphia PA 19132. Free parking is located in the lot across the street from the Gatehouse.

Guide: Rich Wilhelm

**Thursday, February 12, 2015 at 6:30 PM at Laurel Hill Cemetery, 3822 Ridge Avenue, Philadelphia, PA19132. 215-228-8200**

<http://www.thelaurelhillemetery.org>

**VICTORIANS AFTER DARK: LOVE and LUST in the 19th CENTURY (A**

**VALENTINES DAY PROGRAM and RECEPTION)**

The talk will take place on Thursday, February 12 at 6:30pm, in Laurel Hill Cemetery's Gatehouse at 3822 Ridge Avenue, Philadelphia, PA 19132. Free parking is located in the lot across the street from the Gatehouse.

The cost is \$20/person. Space is limited, advance registration is required. Tickets can be purchased by phone (215) 228-8200 or online. Presented by: Alexis Jeffcoat

**Monday, February 16, 2015 at 6:00 PM-7:00 PM** the Academy of Natural Sciences at National Mechanics, 22 S. Third Street, Philadelphia, PA 19106.

At this edition of **Tapping our Watershed**, Julie Slavet, Executive Director of the Tookany/Tacony Frankford Watershed Partnership, presents, "**The Tookany/Tacony Frankford Watershed Partnership: From the Headwaters to the Delaware via Streets and Tweets.**" Good food and beer. Must be 21 or accompanied by parent. Free and open to the Public.

<http://www.ansp.org/get-involved/cep/tapping-our-watershed/>

**Tuesday, February 17, 2015 at 6:00 PM - PENN SCIENCE CAFÉ at World Cafe Live, 3025 Walnut St., Philadelphia**

<http://www.upenn.edu/pennnews/sciencecafe>  
**Irina Marinov, a climatologist in the Earth and Environmental Science Department (Details to come)**

Free and Open to the Public

**Wednesday, February 18, 2015 at Noon** at College of Physicians of Philadelphia, 19 South Twenty-Second Street, Philadelphia, PA 19103, (215) 563-3737 x304

[http://www.collphyphil.org/prog\\_calendar.htm](http://www.collphyphil.org/prog_calendar.htm)

Pre-registration for all programs and events is strongly urged. For further information regarding events and registration, please e-mail [info@collegeofphysicians.org](mailto:info@collegeofphysicians.org) or call 215-399-2341.

**Food & Thought Lecture: "It's Not Rocket Science: Life & Security in the Internet Age."**

Cyber security is very much in the news, with stolen credit cards in the millions, file-destroying ransomware, worries about widespread surveillance, and if that's not enough, you could choose to join the panic about a digital Pearl Harbor. Why are things like this? How bad are the problems, and what's an ordinary person to do? There's not much agreement, even among experts, but Dr. Weinberger will provide some guidance.

**SPEAKER:** Peter Weinberger, PhD, Senior Software Engineer, Google Corporation. The College's Session of Food & Thought lectures will be presented at noon on the third Wednesday of each month and run until May. You can now choose between two ticket types! Our \$13.00 ticket includes lecture and a gourmet boxed lunch: your choice of sandwich (turkey, beef, and vegetarian options available), dessert, and beverage (coffee, and iced tea.) Sales for this option end the Monday before the event.

Our new \$5.00 ticket is perfect for those who wish to bring their own lunch option, or just wish to hear our exciting lectures. This option also includes our beverage service (coffee, and iced tea.) Sales for this option are available in advance and at the door on the day of the lecture.

## PhACT Lecture

**February 21, 2015 at 2:00 PM**

**Professor Alan Mann will discuss "The Scars of Evolution"**

**Saturday, February 21, 2015 at 2:00 pm** at University of Pennsylvania Museum, 3260 South Street, Philadelphia, PA 19104

<http://www.penn.museum/events-calendar>  
**Afternoon Lecture**

**Ancient Egypt and the Land of Punt: An Archaeological Perspective**

Punt was a land to the southeast of Egypt where the ancient Egyptians obtained exotic raw materials, especially frankincense, but also elephant ivory, ebony, and gold. Textual evidence of Egyptian trade there dates to the Old, Middle, and New Kingdoms, but the exact location of Punt remains unknown. In this lecture, Dr. Kathryn Bard, Professor of Archaeology, Boston University, speaks about Punt and discusses new insights on its possible location in antiquity. Presented by the American Research Center in Egypt—Pennsylvania Chapter. Admission: \$10; \$7, PennCard holders; \$5, students with ID; free for ARCE-PA members. For more information, visit [www.arce-pa.org](http://www.arce-pa.org).

**Monday February 23, 2015 at 7:00 PM** at MaGerks Pub and Grill, 582 South Bethlehem Pike, Fort Washington, Pennsylvania 19034.

**American Revolution Round Table of Philadelphia, <http://arrtop.com/>  
Dennis Conrad on A Sea Change: Naval Warfare in the American Revolution in the Spring of 1778.**

**Tuesday, February 24, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Elly Truitt**  
Free and Open to the Public

**Thursday, February 26, 2015 at 6 – 7:30pm** at the **Wagner** Free Institute of Science, 1700 West Montgomery Avenue, Philadelphia, PA 19121  
[www.wagnerfreeinstitute.org](http://www.wagnerfreeinstitute.org) ph 215-763-6529

**Aquatic Underdogs: How Freshwater Mussels Can Help Save our Great Waters.** Dr. Danielle Kreeger, Partnership for the Delaware Estuary

**Thursday, February 26, 2015 at 5:30 PM-9:00 PM** at **The Academy of Natural Sciences**, 1900 Benjamin Franklin Parkway, Philadelphia 19103

[www.ansp.org](http://www.ansp.org) 215-299-1108

**Mega-Bad Movie Night: Anaconda**

Join us at the Academy after hours to watch an "awesomely awful" movie. Witty experts will be onstage to offer their quips and sidesplitting comments on the many scientific absurdities—think Mystery Science Theater 3000! In this edition of Mega-Bad Movie Night we'll be showing the 1997 classic Anaconda

**Friday, February 27, 2015 at 10:00am** at **Laurel Hill Cemetery**, 3822 Ridge Avenue, Philadelphia, PA 19132. 215-228-8200

<http://www.thelaurelhillcemetery.org>  
**MONTHLY FOURTH FRIDAY TOUR: HOT SPOTS and STORIED PLOTS**

In life and in death, we all have stories to tell and what better place to hear tales of wonder than Philadelphia's most famous home of the dead? Join Laurel Hill Cemetery for an informative overview of Laurel Hill's long and colorful history, which will include many of the marble masterpieces, stunning views and legendary stories that afford the cemetery its WOW factor. This is the perfect tour for first-time visitors to Laurel Hill, and anyone else who enjoys beautiful art, scenic nature and fascinating history. "Hot Spots and Storied Plots" will be presented monthly as part of Laurel Hill Cemetery's Fourth Friday tour series, which take place on the fourth Friday of every month at 10:00am.

January's walking tour will take place on, departing from Laurel Hill Cemetery's Gatehouse entrance at 3822 Ridge Avenue, Philadelphia, PA 19132. Free parking is located in the lot across the street from the Gatehouse.

The cost is \$8/person general admission; \$5/ members. Tickets can be purchased at the door, or in advance by phone (215) 228-8200 or online.



**Tuesday, March 3, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Nadia Berenstein**  
Free and Open to the Public



## Calling All Astronomers! Rittenhouse Astronomical Society

**Monthly Meetings! Bring all of your out-of-this-world questions!** Join The Rittenhouse Astronomical Society the second Wednesday of each month at 7:30 p.m. in the Fels Planetarium at the Franklin Institute. The society offers all persons an opportunity to participate in the activities of an astronomical group at the laymen's level. They aim to spread knowledge, awareness and enjoyment of astronomy and astronomical issues. It is a popular science club that keeps its members up-to-date on the latest developments. No experience is necessary to attend the FREE meetings. Come with your astronomy questions!

[www.rittenhouseastronomicalsociety.org/](http://www.rittenhouseastronomicalsociety.org/)

**Tuesday, March 3, 2015 at 6:00pm - 7:00pm**  
at Eastern State Penitentiary, 2027 Fairmount Avenue, Philadelphia, PA 19130 phone: (215) 236-3300

<http://www.easternstate.org/home>

### The Searchlight Series: Conversations About Crime, Justice, and the American Prison System

Discussion Topic TBA. See website for details. Free and Open to the Public. Reception to follow.

**Tuesday, March 3, 2015 at 7:00 PM** at Washington Memorial Chapel, on Route 23 in Valley Forge.

Friends of Valley Forge Park

### Archaeology at Valley Forge

Archaeologist Jesse West-Rosenthal presents a history of archaeology at Valley Forge, details of recent excavations, and a show-and-tell of selected artifacts from the encampment.

<http://www.friendsofvalleyforge.org/speaker-series.shtml>

Free and Open to the Public.

**Wednesday, March 4, 2015 at 6:00 pm** at University of Pennsylvania Museum, 3260 South Street, Philadelphia, PA 19104

<http://www.penn.museum/events-calendar>

### Great Wonders Lecture Series

#### The Lighthouse at Alexandria: The Pharos in the land of the Pharaohs

**Jennifer Houser Wegner, Ph.D., Associate Curator, Egyptian Section**

Founded by Alexander the Great in 332 BCE, the city of Alexandria grew to become one of the most important cities in the ancient world. Alexandria was a hub of intellectual, commercial, political and religious activity, and its Mediterranean harbors were bustling centers of activity. The Lighthouse at Alexandria, or the Pharos, marked the entry into the harbor from the sea. The Pharos was constructed on the orders of the early Ptolemaic kings around 280 BCE. For most of its history, this remarkable building was one of the tallest man-made structures on earth. Writers as varied as Julius Caesar and the Arab traveler Abou Haggag Youssef Ibn Mohammed el-Balawi el-Andalousias, describe this illuminated tower whose image also appears on coinage and mosaics. After a series of earthquakes damaged the tower, it was finally destroyed in the 14th century CE, having served as an iconic image of the city of Alexandria for almost 1500 years. Recent underwater

excavations by French archaeologists have identified remains of the original structure in Alexandria's eastern harbor. This talk will consider the history of the lighthouse, one of the seven wonders of the ancient world.

Lecture with advance payment

\$5 General Admission

\$2 Penn Museum Members

\$10 At-the-door

For more information, call 215.898.2680. To register, visit [www.penn.museum/greatwonders](http://www.penn.museum/greatwonders).

**Wednesday, March 4, 2015 at 7:00 PM** at Frankford Hall on Frankford Avenue just north of Girard Avenue.

### Philadelphia Nerd Nite ... be there and be square, yo.

**Science discussions, good food, good company, and plenty of beer!**

For more information see the website at

<http://philadelphia.nerdnite.com/updates/>

Open to the Public. Admission \$5.00

Email us at: [nerdnitephilly@gmail.com](mailto:nerdnitephilly@gmail.com)

**Monday, March 9, 2015 at 6:00 p.m** at **National Mechanics, 22 S. Third Street, Philadelphia, PA 19106**

### Science on Tap

A monthly gathering that features a brief, informal presentation by a scientist or other expert followed by lively conversation. Good food and beer.

Must be 21 or accompanied by parent. Free and open to the Public.

<http://scienceontapphilly.com/>

Hosted by the Mütter Museum

**Tuesday, March 10, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

### Brown Bag Lecture: Charlotte Abney

Free and Open to the Public

**Tuesday, March 10, 2015 at 6:00 PM - PENN LIGHTBULB CAFÉ** at **World Cafe Live, 3025 Walnut Street, Philadelphia**

<http://www.upenn.edu/pennnews/sciencecafe>

Free and Open to the Public

**Wednesday, March 11, 2015 at 7:15 PM** at the Fels Planetarium, The Franklin Institute, 222 North 20th Street, Philadelphia, PA 19103

**The Rittenhouse Astronomical Society**

Astronomy lecture open to the General Public. See website for more details:

<http://>

[www.rittenhouseastronomicalsociety.org/](http://www.rittenhouseastronomicalsociety.org/)

**Monday, March 16, 2015 at 7p.m** at Commonwealth Chateau, Chestnut Hill College, 9230 Germantown Avenue, Philadelphia, PA 19118

The Institute for Science and Religion

### Transhumanist Dreams and Christian Hopes Ronald Cole-Turner, PhD, H. Parker Sharp Professor of Theology and Ethics, Pittsburgh Theological Seminary

<http://>

[www.irands.org](http://www.irands.org)

Free and Open to the Public. A free will

donation is requested.

**Tuesday March 17, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

### Brown Bag Lecture: Mathias Grote

Free and Open to the Public

**Tuesday, March 17, 2015 at 7:30PM** at the Free Library of Philadelphia, 1901 Vine Street, 19103

<http://libwww.freelibrary.org/authorevents/>  
**Erik Larson | Dead Wake: The Last Crossing of the Lusitania**

Heralded for his "engrossing" and "utterly fascinating" (Chicago Tribune) narrative-driven nonfiction, Erik Larson is the bestselling author of *In the Garden of Beasts*, the story of the first American ambassador to Nazi Germany; and *The Devil in the White City*, a history of the serial killer who stalked attendees of the 1893 World's Fair in Chicago. He has also written books about gun violence in America, the Galveston Hurricane of 1900, and the loss of privacy in the digital age. A former features writer for *The Wall Street Journal*, Larson is currently a contributing writer for *Time* magazine. *Dead Wake* tells the tale of how the 1915 sinking of the RMS *Lusitania* placed America on the path to war.

Pine Tree Foundation Endowed Lecture

Cost: \$15 General Admission, \$7 Students

Buy tickets online | Ticket and Subscription Packages

**Saturday, March 21, 2015** at the **Wagner Free Institute of Science**, 1700 West Montgomery Avenue, Philadelphia, PA 19121

[www.wagnerfreeinstitute.org](http://www.wagnerfreeinstitute.org) Westbrook  
lecture – Times and speaker TBD

## PhACT Lecture

March 21, 2015 at 2:00 PM

**Dr. Deborah Berebichez will discuss “A Non-Stop Skeptic in a Believer’s World”**

**Tuesday, March 24, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Geert Somsen**  
Free and Open to the Public

**Tuesday, March 24, 2015 - PENN SCIENCE CAFÉ** at World Cafe Live, 3025 Walnut Street, Philadelphia  
<http://www.upenn.edu/pennnews/sciencecafe>  
Free and Open to the Public

**Monday March 30, 2015 at 7:00 PM** at MaGerks Pub and Grill, 582 South Bethlehem Pike, Fort Washington, Pennsylvania 19034.  
**American Revolution Round Table of Philadelphia**, <http://arrtop.com/>  
Program to be announced. Check website

**Monday, March 30, 2015 at 7:30PM** at the Free Library of Philadelphia, 1901 Vine Street, 19103

<http://libwww.freelibrary.org/authorevents/>  
**Paul Offit - Bad Faith: When Religious Belief Undermines Modern Medicine**

Paul Offit is the Chief of the Division of Infectious Diseases and the Director of the Vaccine Education Center at the Children’s Hospital of Philadelphia and a Professor of Vaccinology and Pediatrics at the University of Pennsylvania School of Medicine. His many honors include the J. Edmund Bradley Prize for Excellence in Pediatrics from the University of Maryland Medical School and election to the Institute of Medicine of the National Academy of Sciences. Co-inventor of the rotavirus vaccine and a founding advisory board member of the Autism Science Foundation, Dr. Offit is the author of more than 140 papers and five books, including *The Cutter Incident, Vaccinated, Autism’s False Prophets, Deadly Choices, and Do You Believe in Magic?*. His new book addresses the danger of faith healing.

Cost: FREE

No tickets required. For Info: 215-567-4341.

**Tuesday, March 31, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-

2222

**Brown Bag Lecture: Daniel Klein**

**Wednesday, April 1, 2015 at 7:00 PM** at Frankford Hall on Frankford Avenue just north of Girard Avenue.

**Philadelphia Nerd Nite ... be there and be square, yo.**

**Science discussions, good food, good company, and plenty of beer!**

For more information see the website at

<http://philadelphia.nerdnite.com/updates/>

Open to the Public. Admission \$5.00

Email us at: [nerdnitephilly@gmail.com](mailto:nerdnitephilly@gmail.com)

**Thursday, April 2, 2015 at 6:00 PM** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106

<http://www.chemheritage.org> Tel: 215-925-2222

**Rohm and Haas Fellow in Focus Lecture: Nadia Berenstein**

The Rohm and Haas Fellow in Focus Lecture series gives the Beckman Center’s scholars an opportunity to present their work to a broad audience interested in history, science, and culture.

In this lecture Nadia Berenstein will explore the history of synthetic flavors.

Fellow in Focus programs are presented by CHF’s Arnold and Mabel Beckman Center for the History of Chemistry, home to CHF’s fellowship program and the heart of academic programming within the organization.

**Free and Open to the Public**

**Tuesday, April 7, 2015 at 6:00pm - 7:00pm** at Eastern State Penitentiary, 2027 Fairmount Avenue, Philadelphia, PA 19130 phone: (215) 236-3300

<http://www.easternstate.org/home>

**The Searchlight Series: Conversations About Crime, Justice, and the American Prison System**

Discussion Topic TBA. See website for details. Free and Open to the Public. Reception to follow.

**Tuesday, April 7, 2015 at 7:00 PM** at Washington Memorial Chapel, on Route 23 in Valley Forge.

Friends of Valley Forge Park

**The Bartram Family: Plant Collectors in the 18th century**

Joel T. Fry, the curator of Bartram Gardens, shares the story of the careers and travels of John and William Bartram, famed natural scientists and plant men, and the family garden.

<http://www.friendsofvalleyforge.org/speaker-series.shtml>

Free and Open to the Public.

**Tuesday, April 7, 2015 - PENN LIGHTBULB CAFÉ** at World Cafe Live, 3025 Walnut Street, Philadelphia

<http://www.upenn.edu/pennnews/sciencecafe>

Free and Open to the Public

**Wednesday, April 8, 2015 at 7:15 PM** at the

Fels Planetarium, The Franklin Institute, 222 North 20th Street, Philadelphia, PA 19103

**The Rittenhouse Astronomical Society**  
Astronomy lecture open to the General Public. See website for more details:

<http://>

[www.rittenhouseastronomicalsociety.org](http://www.rittenhouseastronomicalsociety.org)

**Saturday, April 11, 2015 at 12 – 4 pm** at the **Wagner** Free Institute of Science, 1700 West Montgomery Avenue, Philadelphia, PA 19121  
[www.wagnerfreeinstitute.org](http://www.wagnerfreeinstitute.org) Special Community Program – Unedited North Philadelphia: Part II, in partnership with the Wagner, The Special Collections Research Center at Temple University Libraries, The Beech Companies, and The Philadelphia History Truck (This is a screening of archived news footage featuring the people, places, and events that shaped the neighborhood around the Wagner. It is a follow up to a popular event we held in November and will be on a Saturday afternoon. The building and museum will be open to the public during the program and we will have the Philly History Truck here to record people’s stories.)

**Monday, April 13, 2015 at 6:00 p.m** at **National Mechanics, 22 S. Third Street, Philadelphia, PA 19106**  
**Science on Tap**

A monthly gathering that features a brief, informal presentation by a scientist or other expert followed by lively conversation. Good food and beer.

Must be 21 or accompanied by parent. Free and open to the Public.

<http://scienceontapphill.com/>

Hosted by the American Philosophical Society Museum

**Tuesday, April 14, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Nandini Bhattacharya**  
Free and Open to the Public

**Thursday, April 16, 2015 at 7p.m** at Commonwealth Chateau, Chestnut Hill College, 9230 Germantown Avenue, Philadelphia, PA 19118

The Institute for Science and Religion  
**Emergent Mind: What Brains and Cognition Tell Us about Faith**

**Phil Clayton, PhD, Ingraham Professor, Claremont School of Theology** <http://www.irands.org>

Free and Open to the Public. A free will donation is requested.

**Tuesday, April 21, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Meredith Farmer**



Free and Open to the Public

**Tuesday, April 21, 2015 - PENN SCIENCE CAFÉ at World Cafe Live, 3025 Walnut Street, Philadelphia**

<http://www.upenn.edu/pennnews/sciencecafe>

Free and Open to the Public

**Sunday, April 26, 2015 at 12 – 4 pm** at the **Wagner Free Institute of Science**, 1700 West Montgomery Avenue, Philadelphia, PA 19121  
[www.wagnerfreeinstitute.org](http://www.wagnerfreeinstitute.org) ph 215-763-6529

## PhACT / Philadelphia Science Fair Lecture

**April 2015  
Date and Location TBA**

**Toxicologist Dr. David Cragin and Science Journalist Faye Flam will discuss the controversy of Genetically Modified Organisms (GMO).**

**Monday April 27, 2015 at 7:00 PM** at MaGerks Pub and Grill, 582 South Bethlehem Pike, Fort Washington, Pennsylvania 19034.

**American Revolution Round Table of Philadelphia**, <http://arrtop.com/>

Program to be announced. Check website

**Tuesday, April 28, 2015 at Noon** at the Chemical Heritage Foundation, 315 Chestnut Street, Philadelphia, PA 19106  
<http://www.chemheritage.org> Tel: 215-925-2222

**Brown Bag Lecture: Michael Worboys**

Free and Open to the Public

**Tuesday, May 5, 2015 at 6:00pm - 7:00pm** at Eastern State Penitentiary, 2027 Fairmount Avenue, Philadelphia, PA 19130 phone: (215) 236-3300

<http://www.easternstate.org/home>

**The Searchlight Series: Conversations About Crime, Justice, and the American Prison System**

Discussion Topic TBA. See website for details.

Free and Open to the Public. Reception to follow

**Wednesday, May 6, 2015 at 7:00 PM** at Frankford Hall on Frankford Avenue just north of Girard Avenue.

**Philadelphia Nerd Nite ... be there and be square, yo.**

**Science discussions, good food, good company, and plenty of beer!**

For more information see the website at

<http://philadelphia.nerdnite.com/updates/>

Open to the Public. Admission \$5.00

Email us at: [nerdnitephilly@gmail.com](mailto:nerdnitephilly@gmail.com)

**Wednesday, May 13, 2015 at 7:15 PM** at the Fels Planetarium, The Franklin Institute, 222 North 20th Street, Philadelphia, PA 19103

**The Rittenhouse Astronomical Society**  
Astronomy lecture open to the General Public.  
See website for more details:

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

**May 16, 2015 at 10:00**

**PhACT Expedition to the Mullica River to Capture the Jersey Devil**

**Wednesday, June 10, 2015 at 7:15 PM** at the Fels Planetarium, The Franklin Institute, 222 North 20th Street, Philadelphia, PA 19103

**The Rittenhouse Astronomical Society**  
Astronomy lecture open to the General Public.  
See website for more details:

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

## PhACT Lecture

**September 19, 2015 at 2:00 PM**

**Professor Paul Halpern will discuss his new book *Einstein's Dice and Schrödinger's Cat: How Two Great Minds Battled Quantum Randomness to Create a Unified Theory of Physics***

**MCHUMOR.com** by T. McCracken



**Newton fails to discover the Theory of Gravity under a coconut tree.**

**Cartoon by T. McCracken**

<http://www.mchumor.com/>

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I support the aims of PhACT and would like to join/rejoin for the next year. The annual membership is \$15 and \$10 for students which includes e-mail delivery of Phactum.

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Membership dues of \$ \_\_\_\_\_ enclosed to pay for \_\_\_\_\_ years of membership.

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**Glenside, PA 19038**

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\_\_\_\_\_

Phone: \_\_\_\_\_ E\_mail \_\_\_\_\_

## The Philadelphia Association for Critical Thinking is grateful

for the hospitality extended by Community College of Philadelphia and especially Dr. David Cattell, Chair of the Physics Department, for hosting PhACT and giving us access to such excellent facilities. Part of CCP's mission is to serve Philadelphia as a premiere learning institution and PhACT is pleased to support this goal by having talks on wide ranging, engaging, and educational topics. Students and faculty are invited to be active participants in our activities.

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Phactum Editor, Ray Haupt  
[phactpublicity@aol.com](mailto:phactpublicity@aol.com)

**“People unfit for freedom - who cannot do much with it - are hungry for power. The desire for freedom is an attribute of a "have" type of self. It says: leave me alone and I shall grow, learn, and realize my capacities. The desire for power is basically an attribute of a "have not" type of self.”**

~ Eric Hoffer (1902 - 1983)