The Next Truth

Where Science and Myth Meet©

Volume 2 Issue 5 **February 2020**

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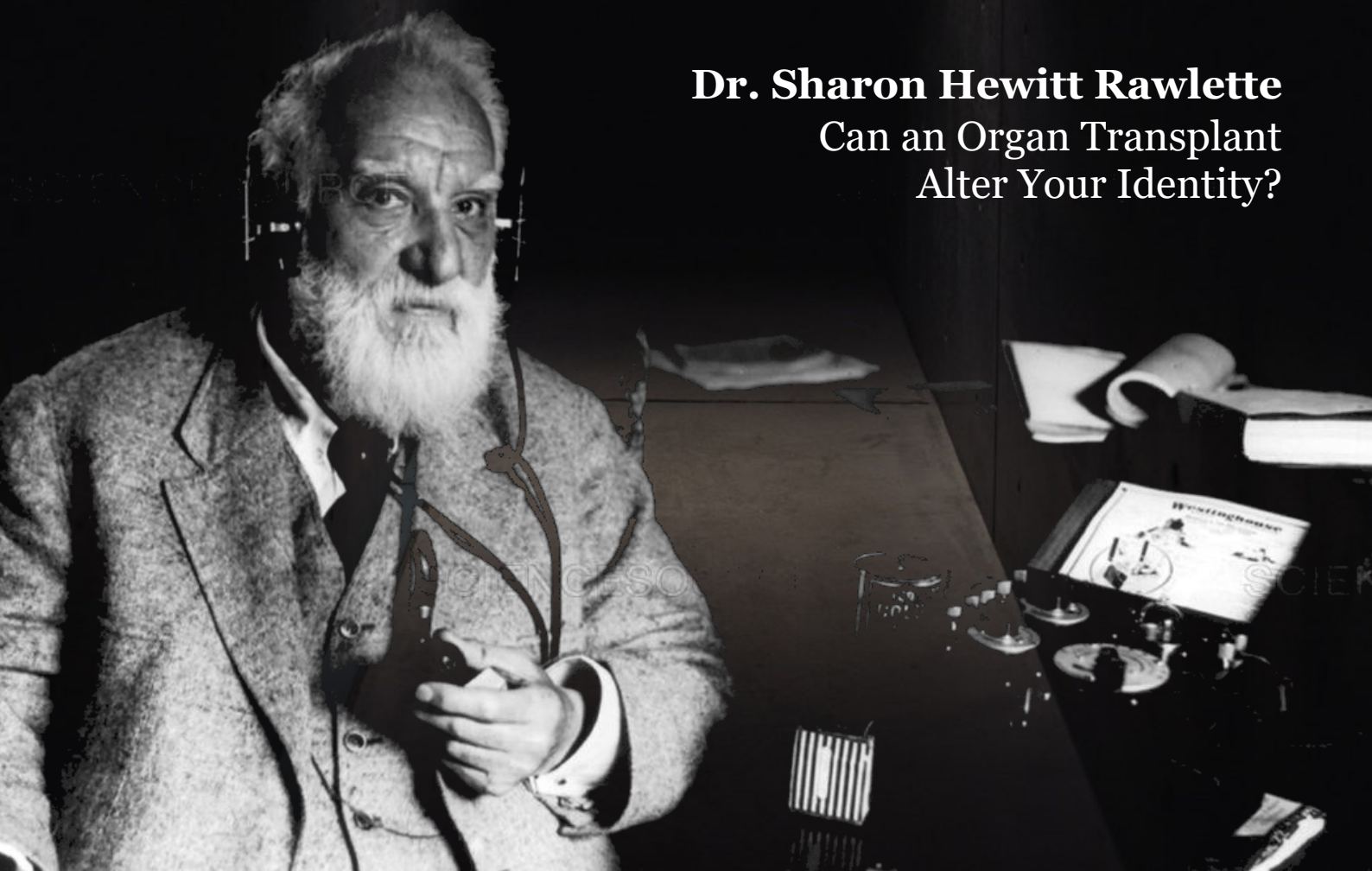

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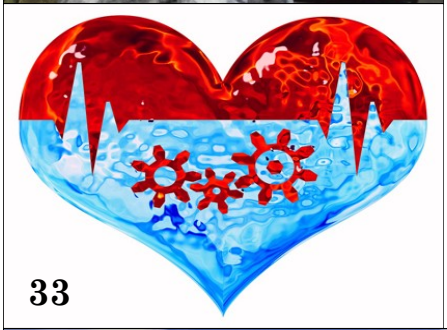

The Next Truth

Where Science and Myth Meet

WAS THERE MORE BEFORE THE BIG BANG?

Walking up to the globe of the CERN (European Organization for Nuclear Research) in July 2017, set a crazy quest for me in any understanding within the origin of evolution and with that the Universe … with tense curiosity… I went back and the story began…

Once upon a time … a little spot, smaller than the dot at the end of a sentence, was hovering through the universe.

This charged particle could have sparked the production of every other particle it encountered, not to mention every galaxy, solar system, planet, and … our species.

That tiny spot exploded in a place being pitch black.

It exploded into an almost inaudible illuminating flash of everything!

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Three Days of Hell on Earth!

2008 was the year that I typed the first story telling words on my laptop and I felt proud when I saved the word document. It took me 6 years after that before I wrote my first scientific lines for a booklet having only 95 pages and it t took me 3 years more before I wrote my very first scientific article. A real crappy one compared to my latest publications. Really, it was that bad, I cannot edit this myself anymore! And yes, I still have the article what bears the title, "Tachyon; the Leading Element in Evolution? "

Nevertheless, holding the home printed version of my very first scientific article I felt like standing at the top of the Mount Everest. I had reached the top of my writing skills! Hum, I was wrong. Standing on that mountain a helicopter flew over and the pilot informs me that I am not on the mountain I thought I was on. Apparently that is a few hundred kilometers in a different direction. How did I end up here? Not to worry, I can tweak a couple of parameters and then apply my insights to the actual mountain I am standing on, assuming it is actually a mountain. Has anyone checked?

After all those years of writing it turned out that I was just starting. 2 more years of struggling and pushing the boundaries in learning more about the scientific fields and how to find the correct words which are expressing both the complexity and the beauty of contemporary science, was what I still had in front of me.

Today, anno 2020, 4 books, 17 published issues of The Next Truth and over two dozen articles can be concluded in my leaning process. But have I reached that point in where I have aced my writing skills? May I tell myself that I am allowed to look out for the highest point of the Mount Everest?

In the second week of January 2020 I received an email from IWMF (International Woman's Media Foundation) what stated that several grant proposals had been opened that provided me the opportunity to submit my proposal. Even this feeling of 'is my English sufficient enough for this' started to overpower me I was eager to start. So, I opened the form and, when scrolling to the bottom, I found that I needed two professional references. SH*T!

It took two days but I found two people willing to act as a reference. Yes…fantastic! Thank you so much. And so, the next day I started to write but what I did not knew in that euphoric moment was that writing this grant proposal turned out to become 3 days of pure Hell on Earth!

My surrounding did not understand me. Why was I putting in these tremendous efforts for something which I probably would not get anyway? "It is an uncertain factor, a waste of time! So, why all these efforts for nothing?" Because I believe in myself, that is why!

Three days passed by of writing, rewriting and pushing my own boundaries…again because this was not the first time that I wrote into a grant proposal. I felt alone, not understood and my brain was slowly turning into something that looked like crumb cake. The moment I finally clicked the 'submit' button, what was about 01:30 in the morning, I could no longer distinguish the letters from the words.

Three days after I started writing my grant proposal, I found myself staring at my computer screen reading these words "Your application has been submitted successfully" over and over again. There I was, tired and alone in the middle of the night and…I cried. I felt relieved, exited and shitty at the same time while dealing with these thoughts of not being selected as a candidate for this grant. People will say…"You see, it was all for nothing. You are just not good enough!"

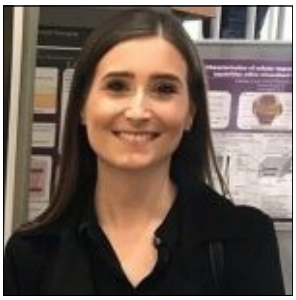
Now, you can say, "Ah, there is that female thing again", but in my opinion, these feelings are logical and normal. It does not show weakness, as some might think of that moment in where someone is expressing his/her emotions and/or thoughts; it shows that you are human first.

For those who write into grant proposals on a regular base, regardless the topic and financial amounts involved, you have my full respect because you have giving more then 100% of yourself.

Contributors

Christopher J. Preston (Montana, USA)

Christopher J. Preston is a professor of philosophy and a fellow at the Program on Ethics and Public Affairs at the University of Montana in Missoula. He works on the ethics of emerging technologies such as synthetic biology, gene drives, and climate engineering. Prof. Preston is the author of several books and numerous articles in environmental philosophy, including The Synthetic Age: Outdesigning Evolution, Resurrecting Species, and Reengineering Our World (MIT 2018). His work in ethics has been funded by the US National Science Foundation. **www.hs.umt.edu**

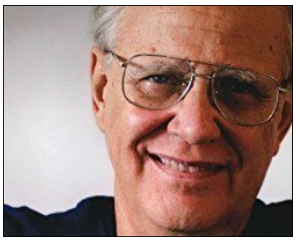


Megan Sharrock (UK)

Dr. Sharrock, PhD, is a researcher at the University of Leeds and part of the CDT TERM iMBE 2017 cohort. Her research is focused on haemarthrosis of the ankle joint and how the biological process contributes to mechanical effect within the ankle joint. She holds a BSc in Biomedical Science with First Class Honors and an MSc with Distinction in Industrial Biotechnology from Liverpool John Moores University. Dr. Sharrock also worked within Upstream Development at Allergan Biologics Limited as an industrial placement student.
www.regenerative-medicine.leeds.ac.uk

Nick Howe (UK)

Nick's involvement with the paranormal developed through an interest in religion, although of no faith it became apparent that the paranormal was a common theme of belief. Coupling this with personal experiences he was staggered by the number of events family, friends and acquaintances also experienced. On retirement he felt it was time to devote more time to studying this which culminated in the formation of PRI UK and became a member of The Society for Psychical Research and the Association for the Scientific Study of Anomalous Phenomena. **www.paranormalresearchinvestigators.co.uk**



Erich Goode (Maryland, USA)

Erich Goode, Professor Emeritus, is an American sociologist specializing in the sociology of deviance, drug use, deviant behavior, criminology, and collective behavior. He received his B.A. from Oberlin College (1960) and Ph.D. in sociology from Columbia University (1966). Prof. Goode has written a number of books on the field in general, as well as on specific deviant topics and is currently Senior Research Scientist in the Department of Criminology and Criminal Justice, University of Maryland. **www.stonybrook.edu**

Sharon Hewitt Rawlette (Virginia, USA)

Sharon H. Rawlette has a PhD in philosophy from New York University. Her parapsychology research has been published in the *Journal of Scientific Exploration* as well as in her 2019 book *The Source and Significance of Coincidences: A Hard Look at the Astonishing Evidence.* She blogs about consciousness and parapsychological topics for Psychology Today.
www.sharonrawlette.wordpress.com

Frank T. McAndrew (Galesburg, Illinois)

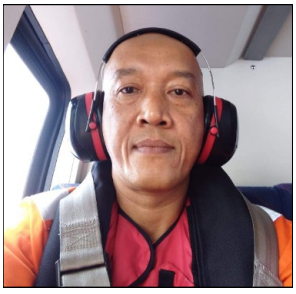
Frank McAndrew is the Cornelia H. Dudley Professor of Psychology at Knox College and is well-known as a purveyor of psychological science to lay audiences. He is regarded as one of the "key individuals" in the history of environmental psychology by researchers in that field. Prof. McAndrew is a winner of the Caterpillar Faculty Achievement Award and has been nominated for the prestigious CASE U.S. Professor of the Year Award. He is an elected Fellow of the Association for Psychological Science, the Society of Experimental Social Psychology and a Charter Fellow of the Midwestern Psychological Association. **www.frankmcandrew.com**

Eric Haseltine (USA)

Erich Haseltine, PhD, is a widely acclaimed popular science writer for Discover Magazine and Psychologytoday.com. An innovative neuroscientist and futurist, He worked at Walt Disney Imagineering as the executive vice president and head of research and development and served the US government as Associate Director of National Intelligence. He currently consults both for Hollywood studios and Intelligence agencies. Dr. Haseltine is the author of *Brain Safari*, *Long-Fuse, Big Bang* (2010), and co-author of *The Listening Cure* (2017) with Dr. Chris Gilbert. **www.drhaseltine.com**

Adriana Bankston (Washington D.C., USA)

Dr. Bankston obtained a Ph.D. in Biochemistry, Cell and Developmental Biology from Emory University and a BA in Biological Sciences from Clemson University. She is a Principal Legislative Analyst in the University of California Office of Federal Governmental Relations. In this role, she serves as an advocate for UC with Congress, the Administration and federal agencies. Prior to this position, she was a Policy & Advocacy Fellow at The Society for Neuroscience, where she provided staff support for special and on-going projects, including SfN's annual lobby event and the society's annual meeting. She is also Chief Outreach Officer at the Journal of Science Policy and Governance. **www.adrianabankston.com**



Yusnadi Usman (Sumatra, Indonesia)

Derrickman Yusnadi Usman, born in Langsa in Aceh Province on the island of Sumatera (Indonesia), is a husband and the father of two. He is an offshore and onshore oil driller for the company Offshore Vantage Groups. Mr. Usman has enjoyed significant job satisfaction during the 20 years he has been working in the oil industry whereby he developed and refined his skills in leadership and organizing. Besides his profession as derrickman, Mr. Usman takes great pleasure in running his company 'Café Truck'. **www.cafe-truck.com**

Girl Scout (USA)

Girls Scout USA extraordinary journey began more than 100 years ago with the original G.I.R.L., Juliette Gordon "Daisy" Low who, on March 12, 1912, in Savannah, Georgia, organized the very first Girl Scout troop. Girl Scouts unleashes the G.I.R.L. (Go-getter, Innovator, Risk-taker, Leader) in every girl, preparing her for a lifetime of leadership, from lobbying the city council with her troop to holding a seat in Congress; from running her own cookie business today to tackling cyber-security tomorrow. **www.girlscouts.org**

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We Are Human Scientists!

By Dr. Megan Sharrock, www.imbe.leeds.ac.uk

The word human relates to the characterisation of humankind and as scientists I believe we aim to show the better qualities of humankind. In spite of this, I have long felt the need to defend my 'human' status as a scientist, in particular as a female scientist. We are often made to feel that emotion is a weakness and that as a scientist we must focus on logic alone.

Many scientists have the 'brain' to conduct scientific research, the natural intelligence and ability. However, I would like to see more 'heart' in scientific research. The overwhelming desire and need to help others and further scientific knowledge.

Here are five ways that embracing our emotions can benefit us and our research.

1. Motivation Is Key

As scientists we recognise that research has its peaks and troughs (maybe more troughs than peaks if we are completely honest). During those times motivation is key to maintain perseverance and resilience. For that reason, emotion is essential. Although we are intellectually capable of conducting scientific research and interested in our field of work, without the motivation and determination to succeed our research would be hindered.

For me motivation comes from the underlying need for my research. The clinical need behind my research is the reason I care so deeply about my work and why I remain motivated. Last year I had the pleasure of attending a conference where I got to meet many patients who shared their past experiences and thoughts on my research. This was invaluable. Being emotionally connected to my work and wanting to better the lives of others is why I chose to become a scientist. Without embracing that emotion, I would not be the researcher I am today. Think about the reason you became a scientist and what emotions this provokes for you, both the good and the bad. Embrace them.

The CDT has allowed me to continue to learn and develop skills in new areas aside from biology including engineering and business innovation through the wide selection of taught modules and laboratory placements whilst being a part of active research.
www.regenerative-medicine.leeds.ac.uk

2. Human Versus Scientific Answers

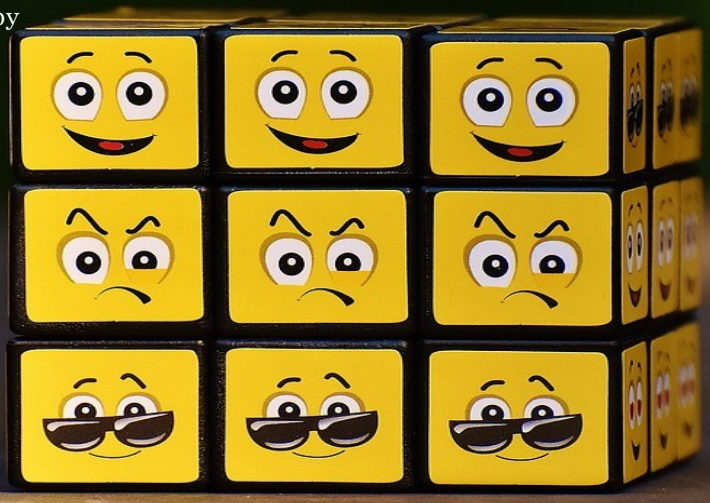
An insecurity of mine is Imposter Syndrome, one that many scientists share. There have been many times that I have attended a conference, a seminar, a meeting where despite my existing scientific knowledge, I feel completely lost on the subject matter. This is perfectly fine as we continue to learn and expand our knowledge over time.

However, as scientists we can become fixated on terminology and this can be detrimental to the widespread sharing of our work. When asked about my research I feel I often give more 'human' answers compared to other scientific researchers. Initially, this was an insecurity for me as I didn't feel as intelligent as my peers. However, it was brought to my attention that this is an advantage I have to embrace. Providing basic, simplified answers on complicated subject matter can result in increased understanding among researchers as well wider audiences which promotes public engagement. ›››

The role of human emotions in science and research.

"We tend to think that science is all about facts and logic and human feelings are often neglected or considered an obstacle to get rid of. Emotions are as important in science as they are in any other part of our lives. Science is made by humans, and as human beings, we cannot get rid of our emotions."

Source: Ted talk by Ilona Stengel



Referring back to my previous point, not all answers require in depth, highly detailed scientific terminology or 'robot' language as I like to call it. When presenting your work, answer honestly and refer back to the reason you decided to be a scientist. You care. That is more than enough.

3. Understanding Your Colleagues

Embracing your emotions in the workplace can benefit you but also your colleagues. Furthering your understanding of your colleagues can lead to a more efficient working environment and reinforce interpersonal relationships. We all have differing levels of emotional intelligence and that should be respected. The common expectation to leave our emotions at the door has always confused me. I am human. I have emotions. If we normalised and utilised our emotional capacity this would provide a more supportive work force and promote passionate research.

4. Supervisor-Student Relationship

I have been extremely lucky to have such understanding, supportive and passionate supervisors throughout my studies and road to research. Unfortunately, this isn't the case for everyone. I believe this can be attributed again to the lack of emotion within our working environment.

Checking in with your student on a 'human' level can make a world of difference to their research. Although work is important, if a person isn't feeling their best, their work will not be their best. Therefore, it makes sense to allow them to be honest about their feelings. My supervisor and I often split our meetings to address both work and personal topics. I often joke that the first half of our meetings are a therapy session and the other half about work. For me it is important to have a supervisor who I feel comfortable and able to share with or my work would suffer as a result. Also, asking your supervisor how they are and checking in with them can make a difference. Maintaining a brave face at work isn't always possible. We are human.

5. Aspire To Inspire

A common question: how do we get more people interested in STEM? EMOTION. Teach children and adults about how exciting STEM is. Show them how STEM can upset you when you see others suffering due to a lack of research. Express your frustration when your grant is rejected. Portray how happy you are when your methodology produces the results you want. Exude pride when your research has an impact. If we want others to become involved in STEM, we have to inspire them. I firmly believe that if I can become a scientist that anyone can. If you have the 'heart', your 'brain' will follow.

■ ■ ■

This article originally appeared at The Female Scientist, **www.thefemalescientist.com**

Are computers intelligent?

Well it does as long as you don't have a clapped-out Mini from the sixties. It's amazing that NASA sent astronauts to the Moon using less computing power than you will find in a modern family car – we're not even talking top of the range models here.

Mouse-less cars

So if they didn't need it to get to the Moon, why does your car need all that processing power just to get you around town? Cars don't have a mouse, USB port or qwerty keyboard, but they do contain up to 50 separate computers controlling the in-car hi-fi display, the ABS anti-locking brakes, the air bags, the air conditioning and even the locks. And this is before you take in account any back seat entertainment systems or satellite navigation gizmos.

Perhaps the most important computer in a modern car is the one that monitors engine emissions and adjusts spark plug rates, fuel injection and the air to fuel ratio in the engine in order to keep noxious emissions as low as possible. Making these sorts of adjustments can also improve engine performance and souped-up cars are now as likely to have additional software as alloy wheels.

Pockect calculator in space

But back to the Apollo mission. When men first walked on the Moon (1969), the Apollo guidance system was the first computer able to provide real-time flight information and automatically navigate the spacecraft. It was also the first operating system to use integrated circuits (miniature electronic circuits like micro chips) but it had a calculator-type keypad and screen. Despite looking primitive, it could multi-task and control actions such as turning on the lunar module descent engine at the right time.

In case of malfunction, the crew were able to use a spare programmable pocket calculator or a slide rule as a back up. It was definitely the skill of the Apollo astronauts and the team back at Mission Control that made the mission a success.

Could computers ever drive cars without us?

In the eighties TV series Knightrider, Michael Hasselhoff's best mate was his talking car, KITT, but will our cars ever really drive themselves? Up to now, computers have been added to cars to improve both the experience of the driver and road safety. However, as the processing power of computers increases, they will be able to take a more active role in driving.

Smart steering wheel

Researchers at the University of Portsmouth have developed a smart steering wheel that monitors the road conditions and speed in order to make changes to the braking and suspension of the car. There are also smart braking systems that know from the movement of your feet whether you are about to make an emergency stop and therefore can react much faster than normal. And speeding could become a thing of the past when speed restrictions are enforced by wireless transmission direct to the engine of your car.

Computer driven cars

But would you be happy to travel in a computer driven car? As computers take over more and more of the tasks involved in driving, drivers could become less aware of their surroundings making it more difficult for them to retake control in an emergency. Also, if a computer driven car is in an accident, who takes the blame?

Even if it still sounds like science fiction, in 2005 a driverless car called Stanley won $2m after autonomously completing a gruelling 131 mile course through the Mojave desert in Nevada. But now Stanley's developers at Stanford University are setting themselves up with an even bigger challenge, the DARPA Urban Challenge.

Junior, who is Stanley's successor, will have to negotiate city streets and obey traffic laws as well as avoiding obstacles and other traffic. But the large amount of kit needed to guide Junior, including eight laser systems, a GPS accurate ›››

to 30cm and numerous custom-built software applications, means that we won't be seeing computer-driven cars in the high street any time soon.

Is it true that NASA spent thousands of dollars developing a space pen, whereas the Russians just took a pencil?

As with most urban myths, there is a tiny grain of truth in this claim, but NASA weren't as spendthrift as some might like to think. NASA did start to develop a space pen, but the costs soon spiralled and when the agency came up against public opposition the astronauts reverted back to using pencils.

However, at around the same time, Mr Fisher of Fisher Pens had also started developing a pen that would work in weightless conditions using his own money. Fisher's pen had a pressurised ink cartridge which worked in weightless environments, in extreme temperatures and even underwater.

Presented with a fully developed pen, NASA managers agreed to equip the Apollo astronauts with Fisher's space pen. And the Soviet Union soon followed, supplying their cosmonauts with the pen at the end of the 1960s.

What type of technology is being used on space missions today?

Computer technology has come a long way since the Apollo astronauts took pocket calculators and slide rules into space but we still don't have the all-knowing talking computers predicted in films such as 2001: A Space Odyssey and Sunshine. So what technology do future space missions have in store?

NASA's replacement for the Space Shuttle, Orion, is due to start round trip missions to the International Space Station in 2014 before heading for the Moon around 2020 and then ultimately Mars. Almost all aspects of Orion's missions will be computer driven, relieving the astronauts of mundane checklists, navigational tweaks and button pressing. And all this only needs three briefcase sized computers.

The trouble of touch screens

A lot of thought has gone into improving the way information is displayed as well. Orion's computers will be linked to four flat screen panels, but NASA haven't missed a trick in not using touch screens. Imagine what might happen if a floating pen accidentally bumped into a screen…

So with these advances in computer technology, what are the possibilities for completely unmanned craft making its way to the Moon? Well, if you are up for challenge then you can enter the recently opened Google Lunar X Prize. The prize offers $30 million to anyone who can send an unmanned rover to the Moon. The rover not only needs to land on the Moon, but also to rove 500 metres across the Moon's surface and send video, images and data back to Earth.

Are computers intelligent?

Defining intelligence is notoriously difficult and psychologists now think that there are lots of different aspects to it including social, logical, creative, emotional and practical intelligence.

So how can we tell if a computer is intelligent? One of the most famous tests was developed by Alan Turing in the 1950s. Turing said that if a computer could fool a person into believing that it was human, then it should be classed as intelligent. So far, no computer has passed the Turing Test, but each year, developers compete for the Loebner prize for the most humanlike computer 'chatterbot'.

■ ■ ■

The Paranormal: Can New Science Explain Old Phenomena?

By Dr. Eric Haseltine, PhD, www.drhaseltine.com

Media personality Connie Willis was late for a meeting at Disney's Celebration community in Florida, and hopelessly lost as she drove the confusing maze of streets and highways around Walt Disney World. Growing anxious because the meeting was important to her, Connie heard a voice in her head say "turn left."

As someone who was open to paranormal phenomena (she's now weekend host of a popular nighttime radio show that covers the paranormal), Connie listened to that voice and quickly found her way to the meeting.

Years later, describing the experience, Connie said, "When you tell people you hear a voice, you worry that people will think you're schizophrenic, but every time I've heard something it has been 100 percent correct."

Dr. Eric Haseltine is a neuroscientist, futurist and the author of *Long Fuse, Big Bang: Achieving Long-Term Success Through Daily Victories* and *Brain Safari,* among others. **www.amazon.com**

It turns out that a lot of people would *not* think Connie was crazy for hearing a voice—possibly from a helpful spirit—because, according to Huffington Post/YouGov and Pew Research polls, a majority (up to 65 percent) of Americans believe in paranormal/supernatural phenomena that include spiritual energy, ghostly encounters, premonitions and connecting with the dead.

Moreover, a 2017 Chapman University survey found that a whopping 75 percent of Americans hold at least one paranormal belief, the most common beliefs being that ancient civilizations such as Atlantis once existed or that ghosts are real.

Despite the wide prevalence of beliefs in the paranormal, it's hard to find any "hard" scientist—the kind who require hard evidence in tightly controlled studies—who take the paranormal seriously. And indeed, I count myself among those hard scientists who remain highly skeptical of reports of ghosts, premonitions, aliens, lost continents, or past lives.

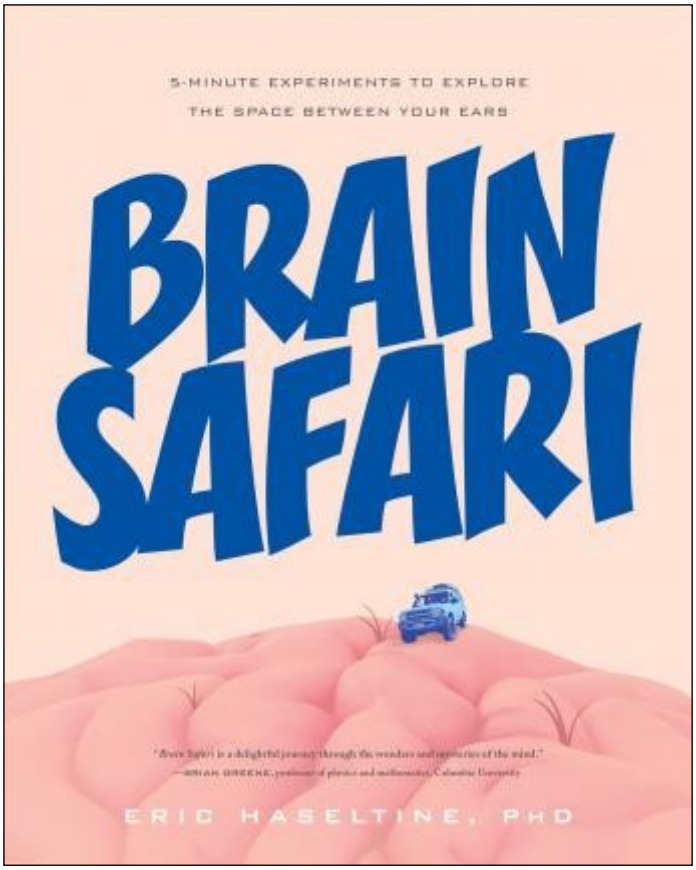
But, although I see little hard evidence for paranormal or supernatural phenomena, I also believe that conscientious scientists need to keep an open mind, and be very careful not to label things as "impossible." Reputable 19th century physicians and scientists thought it impossible that invisible particles (bacteria) could cause disease, and, over a century later, similarly reputable physicians and scientists thought it impossible that bacteria could cause ulcers, until Dr. Barry Marshall got the Nobel Prize for proving that *H. pylori* bacteria actually do cause ulcers. Similarly, physicist Eric Betzig recently got the Nobel Prize for demonstrating a phenomenon that was widely believed to be impossible (overcoming something called the diffraction limit that restricts how much magnification is possible in a light microscope). Finally, as I mentioned in my last post on Quantum Neuroscience, even a genius like Einstein turned out to be wrong when he labeled the quantum phenomenon "spooky action at a distance" impossible.

OK. So keeping an open mind is important in science: but is there any hard scientific evidence for any paranormal phenomena?

Up until recently, I would have said such evidence was sketchy at best. For example, in a previous post, Can your heart predict the future, ›››

I described research at Florida Atlantic University suggesting that changes in heart rate can sometimes foretell near-future events, but these findings remain highly controversial and are not widely accepted.

However last month, as my wife, Dr. Chris Gilbert, and I were researching new findings in mind-body medicine, we stumbled upon research in a new field called epigenetics that made me wonder whether a particular paranormal phenomena—memories from past lives—might not have at least a little bit of validity.



It seems our brains have a multitude of ways of doing things we have absolutely no idea about. Dr. Eric Haseltine builds a fascinating and convincing argument that our brains actually go out of their way to hide their actions from us. Through a series of fun, quick experiments that you can do by yourself, you will uncover these surprising secrets while on a thought-provoking adventure.

As opposed to the field of genetics, which concerns itself with studying the way changes in inherited genes influence anatomy, physiology and behavior of living organisms, epigenetic science explores ways that inherited genes are *turned on or off*. For example, young mice who undergo early trauma undergo epigenetic changes in the way that glucocorticoid receptor genes express themselves, making the traumatized animals more likely to develop stress hormone-related behavioral responses—such as social avoidance—later in life. These epigenetic changes are thought to occur through processes such as methylation, in which a methyl group (CH4) attached to a DNA molecule prevents expression of a particular gene.

Although conventional wisdom held that such epigenetic changes to behavior stay with an individual and do not pass down to their progeny, studies conducted in 2016 suggest that acquired traits can indeed be passed down through the generations, even in humans. Dr Nicola Iovino of the Max Planck Institute of Immunobiology and Epigenetics, a leading researcher in behavioral epigenetic said, "Epidemiological studies revealed a striking correlation between the food supply of grandfathers and an increased risk of diabetes and cardiovascular disease in their grandchildren."

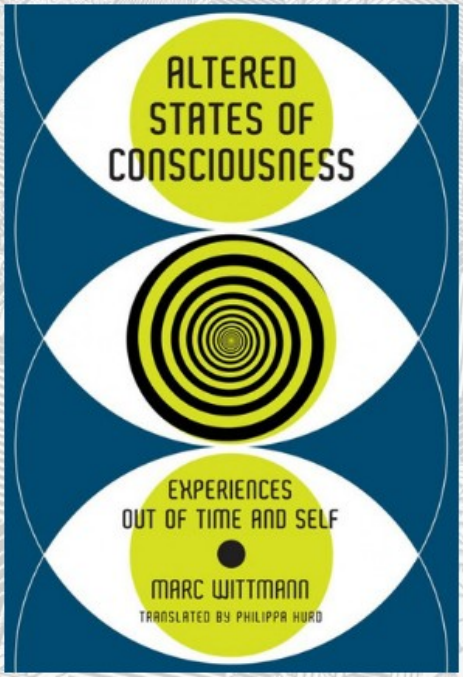
A 2015 review article by Dr. Brian Dias of Emory University Medical School on trans-generational learning through epigenetics in the journal, *Trends in Neuroscience,* described additional evidence that learnings and experiences of ancestors can be passed down to human descendants, including, transmission of PTSD and anxiety/ depression from parents to their children.

Animal research cited by Dr. Dias demonstrates that it's even possible for memories, such as fear of specific odors, to be passed from parents to their offspring.

Could experiences and learnings of your parents and ancestors explain phenomena such as deja vu, intuition or even why you pick up math or music skills so quickly? Did what happened to your ancestors directly influence your dreams, your memories or your emotions? In this hard scientist's opinion, recent research has moved the answer to such questions from a firm "No" to a definite "Maybe," although I'm still trying to figure out whether I believe that all on my own, or got the belief—through the magic of epigenetics—from my parents. Or grandparents. Or great -grandparents

■ ■ ■

This article first appeared in psychology today, **www.psychologytoday.com**



Marc Wittmann

What altered states of consciousness can tell us about the mystery of consciousness?

Dr. Wittmann, PhD, is a research fellow at the Institute for Frontier Areas of Psychology and Mental Health in Freiburg and takes us through the brain science of time perception with clarity and insight. He covers new approaches to the issue from psychological, neuroscience, and clinical studies with a good emphasis on newer imaging studies that implicate brain regions. Dr. Wittmann considers the emergence of the self in waking life and dreams; how our sense of time is distorted by extreme situations ranging from terror to mystical enlightenment; the experience of the moment; and the loss of time and self in such disorders as depression, schizophrenia, and epilepsy.

https://mitpress.mit.edu/books/altered-states-consciousness

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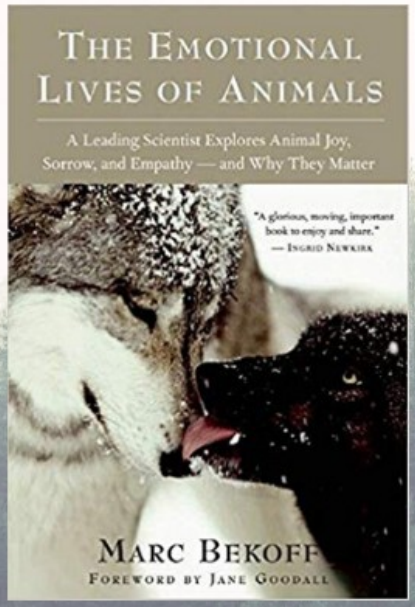


Based on award-winning scientist Marc Bekoff's years studying social communication in a wide range of species, this important book shows that animals have rich emotional lives.

Prof. Bekoff skillfully blends extraordinary stories of animal joy, empathy, grief, embarrassment, anger, and love with the latest scientific research confirming the existence of emotions that common sense and experience have long implied.

Filled with Bekoff's light humor and touching stories, "The Emotional Lives of Animals" is a clarion call for reassessing both how we view animals and how we treat them.

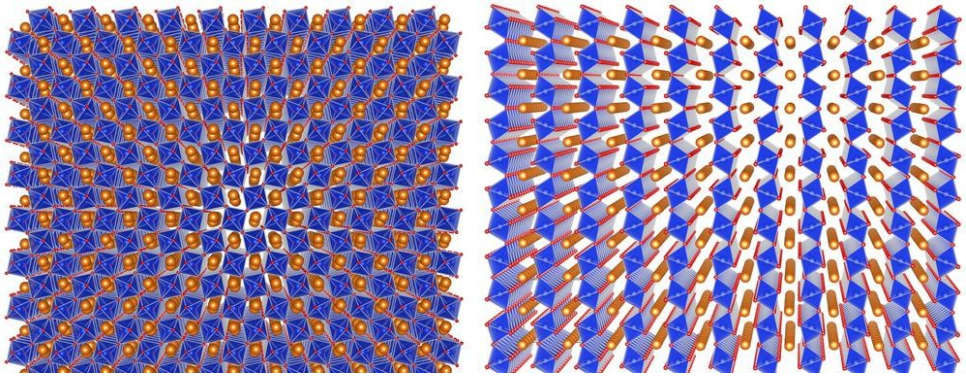
www.amazon.com

Scientists Probe Earth's Deep Mantle in the Lab

Extreme conditions experiments sharpen view of our planet's interior

DESY Press Release, December 2019, www.desy.de

Simulating the conditions 2700 kilometres deep underground, scientists have studied an important transformation of the most abundant mineral on Earth, bridgmanite. The results from the Extreme Conditions Beamline at DESY's X-ray light source PETRA III reveal how bridgmanite turns into a structure known as post-perovskite, a transformation that affects the dynamics of Earth's lower mantle, including the spreading of seismic waves. The analysis can provide an explanation for a range of peculiar seismic observations, as the team headed by Sébastien Merkel from the Université de Lille in France report in the Journal *Nature Communications*.



The crystal structures of bridgmanite (left) and post-perovskite (right).
Credit: Université de Lille, Sébastien Merkel

Bridgmanite is a magnesian-iron mineral ($(Mg,Fe)SiO_3$) with a crystal structure that is not stable under ambient conditions. It forms about 660 kilometres below the surface of the Earth, and microcrystalline grains found as inclusions in meteorites are the only samples ever recovered on the surface. "In order to study bridgmanite under the conditions of the lower mantle, we had to produce the mineral first," explains Merkel. To do so, the scientists compressed tiny amounts of iron-magnesium-silicon-oxide in a diamond anvil cell (DAC), a device that can squeeze samples with high pressure between two small diamond anvils.

The freshly made bridgmanite was then put under even higher pressure of 1.2 megabar (about 1.1 million times the pressure on the surface) corresponding to the lowest layer of Earth's mantle, just above the core. Here, seismic waves are reflected while they are travelling through Earth's interior, and the way they are reflected depends on the characteristics of the material they encounter. "Seismic waves sometimes behave funny in that region," says Merkel. "Sometimes you see strong reflections, and sometimes you don't see anything at all."

Scientists have long suspected that a structural change within bridgmanite is an important part of the explanation. "We have known for 15 years that bridgmanite transforms to a different crystal structure called post-perovskite under these conditions, but what we didn't know was, how fast it does that," explains Merkel. Post-perovskite consists of the same chemical elements as bridgmanite, but has a different crystal structure, leading to different characteristics.

At DESY's Extreme Conditions Beamline (P02.2) the scientists could now investigate the dynamics of the transformation. It turned out that it happens in about 10 to 10,000 seconds, depending on pressure and temperature. This includes the timescale of the frequency of seismic waves. "This means that seismic waves can trigger the transformation, and in turn it can amplify the seismic signal," emphasises Merkel. "This observation explains why you sometimes see strong reflections and sometimes you don't. And it might also explain other anomalies."

The mantle-core boundary at about 2900 kilometres below the surface is not as sharp as a mirror surface. Instead in a region roughly 200 kilometres above the core, known as the D" layer, ›››

large slabs of different material with different structures move about. “You can think of it as a second set of plate tectonics down there,” explains Merkel. Also, in a boundary layer of about 100 kilometres thickness, bridgmanite and post-perovskite can co-exist, complicating the analysis of seismic signals. The more details scientists know about the physical characteristics of the material at the boundary, the better the analysis they can do. This helps not only to investigate the boundary region itself, but also many other regions inside the Earth, as seismic waves probe all layers on their way.

“The better we know the material characteristics at the core-mantle boundary, the sharper is our view of the Earth's interior,” underlines Merkel.

The Université de Lille, the Université Clermont Auvergne, the University of Münster, the Université Lyon, the Institut Universitaire de France and DESY were involved in this work.

■ ■ ■

How Cities and Lights Drive the Evolution of Life

By Professor Christopher Preston, www.humansandnature.org

Urbanization and the spread of artificial light are transforming all of earth's species, bringing about a host of unintended consequences

In 1800, only two percent of the human population lived in cities. A century later, that portion grew to 15 percent. Then, sometime in 2007, a person was born in a city somewhere on the globe who tipped the proportion of *Homo sapiens* that lives in cities over the 50 percent mark. Despite the fact that cities cover only two to three percent of terrestrial surface area, more than half of humanity is now urban-dwelling. There is no going back.

For a species that spent close to 200,000 years living in grasslands and scrubby forests, hunting and foraging, and using skins, wood, and grasses for shelter, we are increasingly occupying an evolutionarily unfamiliar niche, where the sensory and physical dimensions of a life lived in daily contact with the natural world have been replaced by a whole set of alternate experiences: Cement and traffic, 90-degree corners, bars, sirens, glass, and streetlights increasingly dominate our senses. As far as our genes are concerned, we live in an alien world. Phobias about snakes slithering out of toilet bowls, coyotes snatching children out of strollers, and diseases infiltrating city water supplies reveal the location of our biological roots. The shadow of the wild continues to haunt the psyche of even the most entrenched urbanite.

Alongside us, fast-breeding and opportunistic species are changing their behaviors and their genomes so that they will fit better in the urban world. City-dwelling swallows are evolving shorter wings that allow them to avoid the traffic better, and sparrows and starlings have raised the pitch of their calls to compensate for the background urban noise. Moths are gaining different color patterns so that they have more suitable camouflage in their new concrete habitat. Evolutionary forces are turning city-bound mice into separate subspecies in different city parks, unable to exchange genes with cousins who live a few blocks away.

Christopher J. Preston is professor of philosophy at the University of Montana in Missoula, and the author of, among other books, "The Synthetic Age," from which this article is adapted. **www.hs.umt.edu**

A second and related agent of evolutionary change is the progressive banishment of darkness from the world at the hands of electric light. Paul Bogard has written poignantly of his deep regret at the "end of night." He points out that the spread of electricity across many parts of the globe has condemned real darkness to the planet's history. This lack of night comes with sizable biological consequences. Excessive illumination is disrupting the natural rhythms created by millions of years of the earth's steady axial rotation.

The first photos of the earth from space taken by lunar-bound astronauts revealed a spectacular blue marble poised in front of a star-speckled expanse. The individuals lucky enough to see the planet from this vantage point were all ›››

Thanks to the ubiquity of electric light, less and less of the planet falls genuinely into darkness any more.
Image source: Vladimir Kudinov, via Unsplash

transformed. American astronaut Edgar Mitchell memorably described his impression of it as "a small pearl in a thick sea of black mystery." The planet's finitude, its swirling beauty, and its apparent fragility gave our species its first clear sense of our lack of astral significance. Norman Cousins later remarked that "what was most significant about the lunar voyage was not that man set foot on the Moon but that they set eye on the Earth."

More recent photographs of the earth taken at night have revealed a pearl that is increasingly crossed by spider webs of yellow light projected from cities and the transportation corridors between them. The world is now comprehensively illuminated. Thanks to the ubiquity of electric light, less and less of the planet falls genuinely into darkness any more. Power shunted through incandescent filaments, the gases of fluorescent lights, and a billion light-emitting diodes means that darkness is being pushed off the landscape by this electric interloper. Synthetic light races through the air for miles beyond its intended destination, leading to a diffusion rate that far exceeds that attainable by the bulldozers and diggers that make its spread possible.

Prior to Thomas Edison's design of the first commercially viable light bulb, nighttime illumination came only from flames fueled by imperfect sources, such as wood, whale oil, paraffin, and natural gas. The light from these sources danced unpredictably and was always mottled by the smoke of imperfect combustion. The spread of the light was limited by available fuel, environmental conditions, and a basic lack of penetration. Many still feel attached to the light provided by a cavorting flame, seeking it out from wood and wax when wishing to disappear into memories or create venues for intimacy.

When the limited light cast by these flames was overtaken by that of incandescent bulbs, the nighttime started to change its color from a deep inky black to various shades of orange, yellow, and white. The carefree spreading of megawatts of unused light into the night sky has led to a pale dome of illumination above every population center. This glow refuses to leave the city's vault even when most of its residents are asleep. Bogard quotes an Iroquois writer who told him "we have the night so the Earth can rest." As electrification has spread across the world, the amount of rest available to the earth has diminished. This loss to the planet also appears increasingly to be a loss of our own.

Human bodies have natural circadian rhythms. These rhythms are adjustments to the waxing ›››

and waning of light during the earth's daily rotations. Evolution lodged such patterns deeply inside of us. The circadian rhythm has an influence on hormone production, body temperature regulation, blood pressure, and other key functions. Plants, animals, cyanobacteria, and fungi all have similar rhythms that are their own evolutionary adaptations to the rising and setting of the sun. Leaves turn to face the sun and drop in the fall, petals open and close daily, animals rest, and bacteria fix nitrogen at rates that are direct responses to periodic and predictable changes in light. When patterns of light and darkness change, organisms must rapidly adapt or pay the price.

Consider that more than a fifth of all mammal species are bats. In addition to these well-known lovers of a dark world, 60 percent of invertebrates and 30 percent of vertebrates are nocturnal. This means that a large number of the living forms that share the planet with us have evolved so that darkness is an essential factor in their well-being. Of those species that are not fully nocturnal, a large number are crepuscular, a word that has exactly the right sound to describe the creeping and partially hidden character of activity that takes place at twilight. The swapping out of darkness for light across much of the planet affects all of these species.

Sea turtles emerging from the surf and no longer able to navigate by the moon due to beachfront floodlights are perhaps the best-known victims of artificial illumination. But in addition to the turtles, countless other species are shifting their behavioral patterns to accommodate a planet that is increasingly lit up.

Peregrine falcons, for example, are adapting to the new frontier of urban living by figuring out how to hunt pigeons, ducks, and bats in the city at night. The nocturnal hunt no longer involves the 200-mile-per-hour "stoop" from above that has made peregrines famous as the fastest birds on earth. Illumination provided by the glowing city means that the nighttime ambushes involve a new type of stalk. Peregrines fly upward toward the illuminated bellies of their unsuspecting prey, rotating at the last second to pierce the hapless victim's feathered breast with their deadly talons.

Like Homo sapiens adapting to the city, peregrines are figuring out ways to live, feed, and rest in a world that no longer resembles the one their genes prepared them to find.

Meanwhile, in developed countries, up to 20 percent of the workforce is employed in service industries that require employees to be awake for large portions of the night. Night-shift workers such as janitors, health care attendants, and those who labor in 24-hour manufacturing facilities are some of the people who bear this burden. Those who work the graveyard shift seldom replace the number of hours of sleep they missed at night with the same number of hours of sleep during the day.

In a striking indication that the end of night has consequences, the World Health Organization's International Agency for Research on Cancer concluded in 2007 that "shift-work that involves circadian disruption is probably carcinogenic to humans." It is thought that this may have something to do with disruption to the production of the hormone melatonin, but at the moment, ›››

Like Homo sapiens adapting to the city, peregrines are figuring out ways to live, feed, and rest in a world that no longer resembles the one their genes prepared them to find.
Source: Wikimedia Commons

this is little more than a guess. It should come as no surprise that the human body has a deep biological connection to the earth's diurnal rhythm. One of a growing number of local and national organizations concerned about the loss of darkness in America is the National Park Service.

This agency has created a "night sky team" to raise awareness of the importance of darkness as a new type of resource, pointing out with impeccable logic and federally approved rhythm that "half the park happens after dark." In 2006, the Park Service committed itself to preserve the natural lightscapes of parks, which it described in ethical language as "resources and values that exist in the absence of human-caused light." Artificial light is now deemed an "intrusion" into the park ecosystem, suggesting that the distinction between what is artificial and what is natural is not yet completely moot.

Astronomers too are obviously miffed. Light pollution from cities is making optimal conditions for star gazing harder and harder to find. This is not only the concern of a few professionals with big budgets.

Astronomy may be one of the most widely enjoyed arts on the face of the planet, ranging in its practitioners from Ph.D. scientists with multi-million-dollar telescopes to five-year-old children trying not to topple to the ground while craning their necks upward to wonder at the night sky. Seeing the moon and the stars above is one of the most orienting of human experiences, yet it was recently determined that more than a third of the world's population can no longer see the Milky Way due to the presence of light pollution.

There may be no reason to lament the urban path we have taken given its many positive contributions to our humanity. But there is no doubt it is a path causing an unstoppable shift in who we, as well as the species that like to live alongside us, essentially are. After all, "If we never see the Milky Way," asks Bogard (quoting science writer and poet William Fox), "how will we know our place in the universe?"

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This article originally appeared at the MIT Press Reader,
www.thereader.mitpress.mit.edu

In the book "How to Think Like a Neandertal", archaeologist Thomas Wynn and psychologist Frederick L. Coolidge team up to provide a brilliant account of the mental life of Neandertals and offer an eye-opening portrait while painting a remarkable picture of these long-vanished people and providing insight, as they go along, into our own minds and culture.

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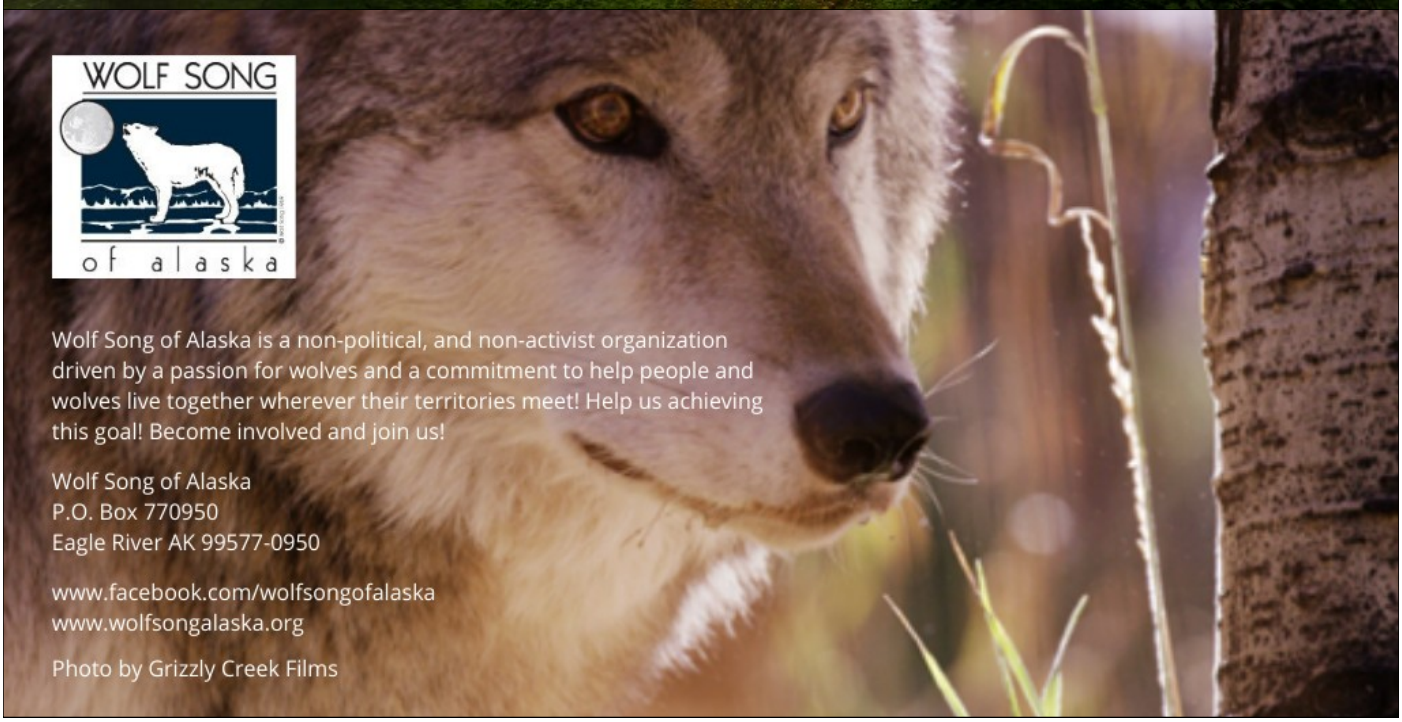

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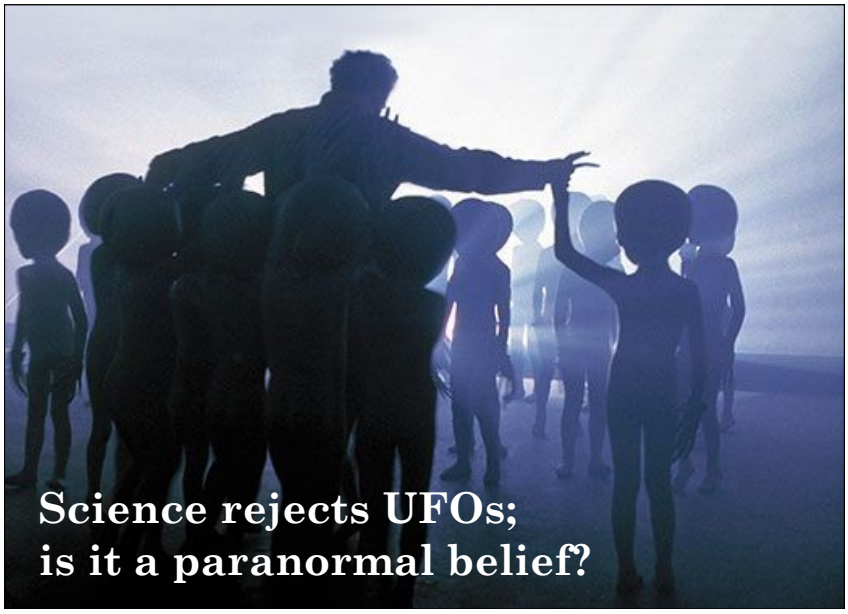
Photo by Grizzly Creek Films

Is It Paranormal to Believe That UFOs Are Real?

By Professor Erich Goode Ph.D, www.stonybrook.edu

Most people use the term, "UFO" or "unidentified flying object," as a catch-all phrase for extraterrestrial craft. Actually, the term means what it says: an object in the sky that hasn't yet been identified. Some UFOs are eventually identified and turn out to be nothing more than the planet Venus, swamp gas, weather balloons, northern lights, or a hoax. In principle, all UFOs could become IFOs—"identified flying objects", if we had enough relevant, verifiable information. Though some UFOs do remain unidentified, this does necessarily not mean that they are alien craft. A substantial number of observers claim that they have identified objects that they saw in the sky specifically as alien craft. Herein resides the source of the controversy: Are UFOs "something real"? Are they alien aircraft? And if no such evidence yet exists, is such an assertion or belief paranormal in nature?



Extraterrestrials almost certainly exist somewhere in the universe. This is not a paranormal belief. Most astronomers believe that, in all probability, intelligent life exists on planets outside our solar system. The late Carl Sagan spent much of his life thinking and speculating about and searching for extraterrestrial intelligence; SETI, the Search for Extra-Terrestrial Intelligence, his pet project, now defunct, expressed this hope. There are 100 of billion of stars in the Milky Way Galaxy, and very possibly 100 of billion of galaxies in the universe. The laws of chance almost dictate that the universe, in some places other than Earth, be teeming with life.

Yet Sagan did not believe that UFOs were "something real," and today, neither do most scientists. But ufologists argue that a search for extraterrestrial intelligence outside our planet is misdirected since, they believe, evidence demonstrates that that intelligence is right here, flying above, or even walking on, the earth. What makes most scientists, especially astrophysicists, uncomfortable about the extraterrestrial hypothesis? And why would some of them brand it as a paranormal belief?

Most people who think, talk, and write about UFOs are mainly interested in one issue: Are they alien spaceships? If we came across evidence documenting the affirmative, this would almost certainly be the most momentous discovery in human history.

Observers have made literally thousands upon thousands of UFO sightings in the United States each year. Since the 1940s, every couple of years, a new poll asks a sample of the American public about their views on UFOs and whether they think they have seen one. In the United States, about eight percent of the population, or one in 12, say that they have seen a "mysterious object" in the sky that might have been a visitor from another planet, and a third believe that it's likely that aliens have visited Earth. Among adults, this computes out to about 20 million people. Supporters of the UFO hypothesis argue that the very volume of such reports provides strong evidence that at least some of them are valid. How could all of them be false? they ask, insisting, "Something must be out there!" ›››

Indeed, if 90 percent, or even 99 percent, of these reports, even all except one, turn out to be hoaxes or misperceptions, then the extraterrestrial hypothesis would still be correct. After eliminating many, most, or nearly all, or all but one, false reports, there remains an irreducible minimum that can't be dismissed or explained away. For the anti-UFO position to be correct, every single report of a UFO would have to be disproven, an obvious impossibility.

To put the matter another way, the fact that there are no valid UFO sightings is readily falsifiable. All that would be necessary is for a single extraterrestrial craft to park itself in a location for everyone to see: a classic flying saucer landing in the Rose Garden of the White House during a press conference with two hundred reporters in attendance, complete with tiny gray creatures emerging from the craft and uttering the classic line, "Take me to your leader." On the other hand, the view that UFO sightings are interplanetary craft is not falsifiable.

Erich Goode, Prof. Emeritus from Stony Brook in 2000, works in the areas of deviance (*Deviant Behavior*, 9th edition, 2011), drug use (*Drugs in American Society*, 8th edition, 2012), and moral paincs (*Moral Panics* with Nachman Ben-Yehuda, 2009), and is currently writing on the sociology-1 of memoir.

There is no conceivable evidence that could be presented or even imagined that will satisfy all or even most committed pro-UFO adherents that space creatures have not visited Earth. If one sighting is shown to be a hoax or a case of misperception, another will be offered. If a hundred are refuted, ufologists will come up with a hundred more. There is no possibility of refuting all of them. This is not a matter of bias on the part of UFO believers or scientists, it is inherent in the logic of the position that most scientists hold: a single piece of unassailable evidence would verify the pro-UFO position; but on this issue, the committed skeptic's position requires all evidence to be negative-which cannot be satisfied. Hence, all reports of UFO sightings do not have to be refuted for the position to be false, according to the scientist. The fact that most follow a recognizable pattern is important.

The major dimension along which believers and doubters differ is the likelihood of accepting alternate realities. Some people have a mind-set that regards anomalous stimuli verifying paranormal phenomena. Others encounter the same stimuli and assume that it must be conventional or routine in origin. Just as devout Catholics see a miracle in a form or shape that resembles Mary or Jesus, ufologists see an alien spaceship in lights or unexplained objects in the sky.

Seeing UFOs as real is correlated with reading science fiction, believing that astrology is accurate, and believing in the occult. Believers do not so much reject mainstream culture as they adapt it to their own version of reality. They are entranced with the mysteries of life, the anomalous, the unusual, the hidden, the fantastic. They believe that there is a dimension beyond the mundane plane of existence that is every bit as real as that which we see in our everyday lives. In addition, it is far more interesting, entrancing, and captivating. Moreover, they are more likely to believe that what they see in their everyday lives provides a clue to that alternate reality; the clues are there if only we have the sensitivity, intelligence, and insight to look for them.

In a study I conducted among my undergraduates, I found a consistent relationship between belief in the reality of UFOs and acceptance of a wide range of paranormal assertions. I asked my respondents to tell me if they agree or disagree with the statement: "Many of the unidentified flying objects (UFOs) that have been reported are really space vehicles flown by intelligent beings from another planet." Just under one respondent in five (19 percent) agreed; four in ten disagreed (40 percent); and the rest weren't sure. Respondents who agreed with the UFO question were also significantly more likely to agree that: the Loch Ness Monster is real; King Tut's curse is ›››

real; astrology is valid and true; some people have ESP; ghosts are real; angels exist; the devil is real; and God created Earth in six days, as narrated in the Bible.

Belief that UFOs are "something real" rests on a general paranormal outlook. Believers hold to a view of reality that is compatible with the idea that: traditional empirical science is incomplete; scientists are often wrong, and what they regard as scientific laws can be skirted or violated; there are dimensions or manifestations of reality not noticed or explained by conventional natural scientists; strange things happen that require unconventional explanations; the ordinary man or woman may notice phenomena that are missed by scientists; it is plausible that occult, supernatural, or spiritual events take place in the material world; and the line between the material, spiritual, and paranormal is often unclear. Theirs is a worldview that finds it perfectly understandable that anomalous, ambiguous stimuli in the sky are alien craft.

In addition, ufologists almost always attribute extraterrestrials with paranormal or supernatural powers: the ability to move through physical barriers, "rematerializing" on the other side; to move physical objects with their mind; to "beam up" physical objects to their space ships; to communicate without speaking; to read the mind of humans.

Einstein's theory of relativity holds that the speed of light traveling through a vacuum is a constant 186,000 miles per second. Hence, objects cannot travel faster than the speed of light; nature prohibits it. As an object approaches the speed of light, the theory holds, it becomes infinitely heavy. All the planets outside the solar system are simply too far for a spacecraft from a location beyond ours to reach us in any conceivable lifetime.

To get here from any distant planet, barring improbable modes of transportation-worm holes, black holes, parallel dimensions, a time warp would require almost unimaginably long periods of time. Light leaving Alpha Centauri at the time of Moses, roughly 3,300 years ago, would arrive here today. All the other stars are much further away. Most scientists regard the obstacles facing technology to travel such vast distances to be virtually prohibitory.

It's not a matter of being smart or advanced enough to overcome such obstacles; it's that the laws of physics dictate limitations on inter-stellar travel. Advances in science are not so much a violation of previously devised laws as an extension of them. No matter how intelligent extraterrestrials are, it’s unlikely that they can work out technology that contradicts Mendeleev's table of periodic elements, Newton's law of gravitation, or Einstein's constant.

Are UFOs extraterrestrial craft? It's more likely that every sighting of an alien craft is erroneous than aliens have gotten here from a distant-that is, non-solar system-planet. Is ufology a paranormal belief? If it brushes away the theoretical problem of surmounting Einstein's constant as a technicality, yes, it is a theory that's based on a paranormal foundation. Ufology is entertaining, entrancing, and enchanting, but it's probably only so much hocus-pocus. We'd all love to rub shoulders with benevolent aliens, but traditional science holds the assertion that they are in fact among us to be as fanciful as belief in angels, fairies, gods, and demons.

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This article was original published on the website of Psychology Today, **www.psychologytoday.com**

Benjamin Radford

Ben Radford is one of the world's few science-based paranormal investigators, and has done first-hand research into mysterious phenomena in sixteen countries on four continents including psychics, ghosts and haunted houses; exorcisms, miracles, Bigfoot, stigmata, lake monsters, UFO sightings, reincarnation, and crop circles, and many other topics. He is perhaps best known for solving the mysteries of the Santa Fe Courthouse Ghost in 2007, the Hispanic vampire el chupacabra in 2010, and his book Bad Clowns, the first to fully examine the evil clown phenomenon.

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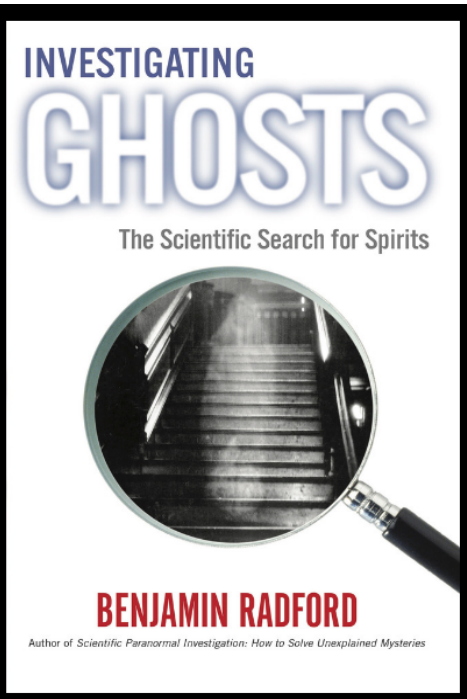

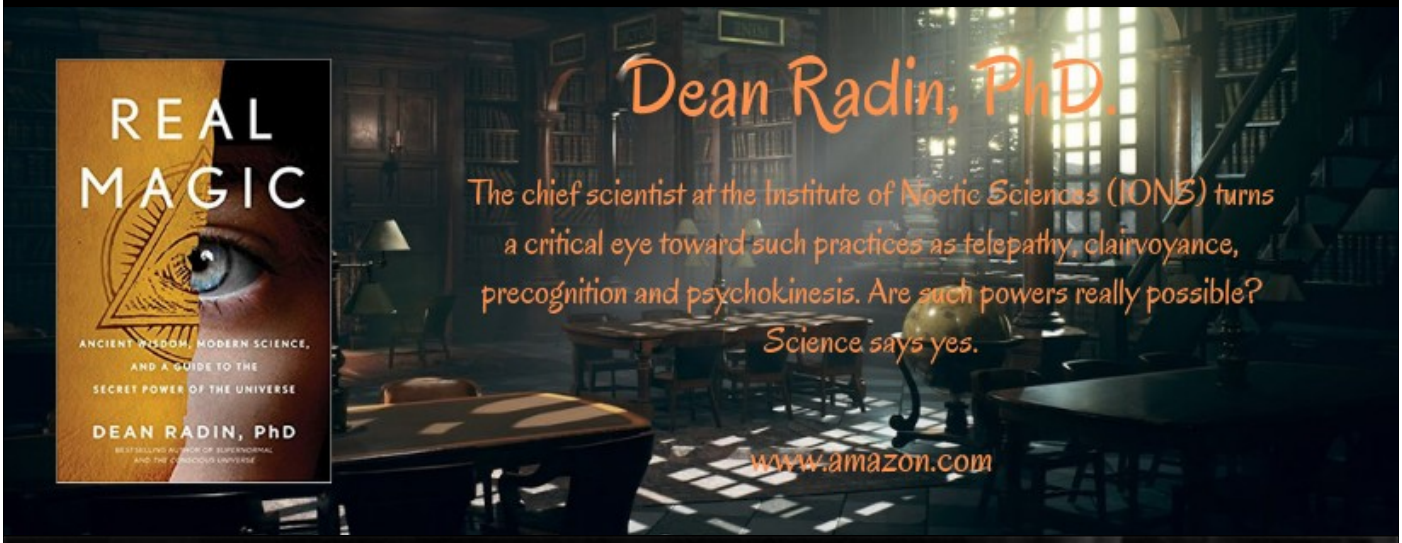

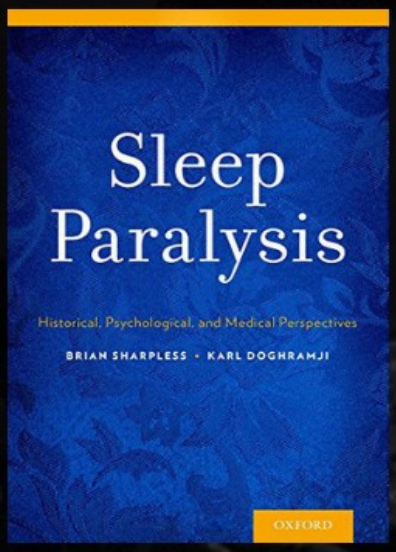

Dr. Brian A. Sharpless

WWW.BRIANSHARPLESS.COM

Humans throughout history have described a peculiar state between wakefulness and sleep during which they are consciously aware of their surroundings, but physically paralyzed. Sleep paralysis is also commonly accompanied by high levels of fear, feelings of suffocation, and hallucinations (i.e., waking dreams).

Drs. Brian Sharpless and Karl Doghramji synthesize the many literatures while providing practical guidance for the diagnosis and treatment of sleep paralysis. Included are medication suggestions and a new psychotherapy manual for mental health professionals.

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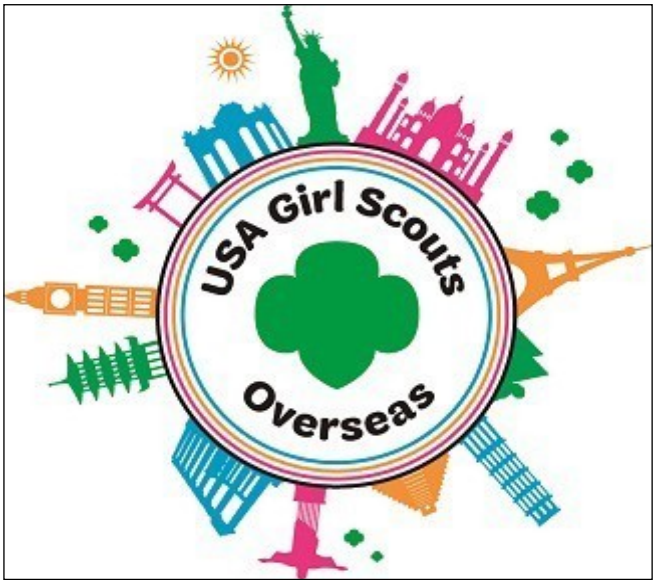
Girl Scouts Works With the SETI Institute to Skyrocket Girls' Interest in STEM

By Girl Scouts of the USA Press Room, www.girlscouts.org

On August 17, 2017 (New York, NY), Girl Scouts of the USA (GSUSA) announced new details about a five-year program called Reaching for the Stars: NASA Science for Girl Scouts. Funded by NASA's Science Mission Directorate and led by the SETI Institute, the program offers more girls opportunities to explore careers in science, technology, engineering, and math (STEM) through new Space Science badges.

Research shows women are still vastly underrepresented in STEM fields and exposing girls to these subjects at a young age is vital to ignite their curiosity and close this gap. In response, together with five partners—the SETI Institute, Girl Scouts of Northern California, the Astronomical Society of the Pacific, the University of Arizona, and ARIES Scientific—GSUSA is equipping girls as young as five years old with the confidence and skills they need to take their STEM interest to the next level.



At the center of the collaboration are new Space Science badges for girls at every Girl Scout grade level. These badges, combined with GSUSA's larger suite of national STEM programming, provide a seamless pathway for girls to develop a lifetime love of the cosmos and its endless possibilities. The badges range from Space Science Explorer, which introduces Daisies in kindergarten and first grade to the fundamentals of space science, to Space Science Master, which engages Ambassadors in grades 11–12 in their own explorations of space based on research that NASA scientists are conducting.

Other badges include Space Science Adventurer (for Brownies), Space Science Investigator (for Juniors), Space Science Researcher (for Cadettes), and Space Science Expert (for Seniors).

By 2019, the Space Science badges will join GSUSA's already robust roster of STEM badges for girls, and all badge content and activities will be delivered to volunteers through the organization's national online Volunteer Toolkit. This "digital assistant" for troop leaders, volunteers, and parents not only makes it easier than ever to plan meetings and activities but also makes STEM programming more accessible and understandable for volunteers, reducing the intimidation some feel when guiding girls' STEM experiences.

Additionally, thanks to NASA's funding, in the summer of 2017, 90 Girl Scout councils across the United States received kits filled with materials that allow girls to explore space science and eclipse-related activities, leading up to the August 21, 2017 Total Solar Eclipse.

The kits include instructions for educational activities, such as using smart-phones or digital cameras to "see" infrared light, using the sun to tell time, and building a solar oven. Many Girl Scout councils have held eclipse-viewing events on August 21 Science lovers have purchase eclipse-viewing glasses, a complete guide to the Total Solar Eclipse, and more from participating councils' stores.

"We are incredibly grateful for the SETI Institute's partnership and the funding from NASA's Science Mission Directorate to make space-science learning even more accessible to girls," said GSUSA CEO Sylvia Acevedo.

Read further on page 30

girl scouts
of western ohio

FRIENDS TODAY. CHANGEMAKERS TOMORROW

Make new friends? Discover new passions? She'll do all that and more at Girl Scouts! Whether she's exploring nature and the outdoors, expressing herself through art or music, designing robots or board games, or helping her community through service projects, she'll have a blast as she earns badges in just about anything that piques her interest. Get ready, because she's going to make the world a better place—today and for the next generation!

BECOME A GIRL SCOUT!
gswo.org/getstarted

Please attend our Girl Scout Troop Formation Meeting:

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6:30-7:30 p.m.
Friendship Methodist Church
Thomas Family Hall
1025 Springfield Pike

Questions? Contact:
Joan Callahan at
513.295.5680 or
justjoanathome@gmail.com

At Girl Scouts, the next opportunity to stand up, speak up, and take the lead is never far away.

"My experience as a Girl Scout prompted my love of all things STEM, and served as the foundation for my future career as a rocket scientist. It also empowered me with the leadership skills and confidence to excel within a male-dominated field. Now, through this collaboration, even more girls will have the opportunity to explore the exciting realm of space science, in the supportive and holistic environment that Girl Scouts provides."

According to the Girl Scout Research Institute study *Generation STEM: What Girls Say about Science, Technology, Engineering, and Math* (2012), though a majority of girls find STEM fields interesting (including 74 percent of teen girls), gender barriers persist: only 13 percent of girls say their first career choice would be in STEM, and 57 percent say that if they went into a STEM career, they'd have to work harder than a man to be taken seriously. In addition, extracurricular engagement in STEM among girls remains low. Only a third (36 percent) of girls who identify as having an interest in STEM report having participated in STEM activities outside school.

Girl Scouts has long been committed to challenging stereotypes and providing girls of all ages with interactive and engaging programs that increase their interest in STEM. In fact, the Girl Scout Research Institute's *The Girl Scout Impact Study* (2017) found that Girl Scouts are more likely than non–Girl Scouts to participate in STEM activities, such as conducting science experiments, designing video games, and building robots (60 percent versus 35 percent). And Girl Scouts goes beyond offering STEM content by also providing a supportive all-girl environment that fosters social, emotional, and leadership development, the ingredients girls need to develop the confidence to persevere and succeed.

"Girl Scouts, the SETI Institute, and NASA have a rich heritage of working together to give girls more opportunities to learn about space science, and we are excited to advance the cause," said the SETI Institute Director of Education Edna DeVore. "With the resilience, ingenuity, and courage Girl Scouts instills in girls, it's no surprise that many female astronauts in the United States are Girl Scout alumnae. We recognize today's girls are tomorrow's STEM leaders, and with the new badges and programming, Girl Scouts everywhere will have access to even more of these opportunities, building the next generation of women leaders in STEM that we so desperately need." Along with the new badges and total solar eclipse events, GSUSA's collaboration with NASA and the SETI Institute supports leadership training in astronomy for Girl Scouts at NASA's Goddard Space Flight Center and the University of Arizona.

We are Girl Scouts of the USA

We are 2.6 million strong—1.8 million girls and 800,000 adults who believe in the power of every **G.I.R.L. (Go-getter, Innovator, Risk-taker, Leader)** to change the world. Our extraordinary journey began more than 100 years ago with the original G.I.R.L., Juliette Gordon "Daisy" Low. On March 12, 1912, in Savannah, Georgia, ›››

she organized the very first Girl Scout troop, and every year since, we have honored her vision and legacy, building girls of courage, confidence, and character who make the world a better place. We're the preeminent leadership development organization for girls. And with programs from coast to coast and across the globe, Girl Scouts offers every girl a chance to practice a lifetime of leadership, adventure, and success.

About the SETI Institute
Founded in 1984, the SETI Institute is a non-profit, multi-disciplinary research and education organization whose mission is to explore, understand, and explain the origin and nature of life in the universe. Our research encompasses the physical and biological sciences and leverages expertise in data analytics, machine learning and advanced signal detection technologies. The Institute is a distinguished research partner for industry, academia and government agencies, including NASA and NSF. To connect with the SETI Institute, visit www.seti.org.

About NASA
NASA leads the Nation on a great journey of discovery, seeking new knowledge and understanding of our Sun, Earth, solar system, and the universe. The NASA Science Mission Directorate (SMD) searches for answers across three overarching themes: Safeguarding and improving life on Earth, searching for life elsewhere, and discovering the secrets of the Universe. SMD's STEM Science Activation program advances STEM to improve U.S. scientific literacy through the leveraging of partners such as GSUSA and SETI.

"Reaching for the Stars: NASA Science for Girl Scouts" is based upon work supported by NASA Science under cooperative agreement No. NNX16AB90A. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Aeronautics and Space Administration.

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To volunteer, reconnect, donate or join
visit **www.girlscouts.org**
Visit **www.girlscouts.org/councilfinder** to contact a local council for information.

Can an Organ Transplant Alter Your Identity?

By Dr. Sharon Hewitt Rawlette, www.sharonrawlette.wordpress.com

In 1988, Claire Sylvia received the first heart-lung transplant performed in New England. In the days and weeks following her surgery, she realized that she had some strange new cravings. For one thing, she found herself "dying for a beer," even though she'd never liked beer before. She also began to add green peppers to everything she ate, whereas before she had always picked them out. And, when she was finally able to drive again, she found herself heading to KFC for chicken nuggets, even though she had always steered clear of fast food in the past.

There were other odds things, too. Like the fact that Sylvia suddenly found herself with an immense amount of energy, even more than that of other heart transplant recipients she knew. And she rarely got sick anymore, even though she was now on immunosuppressants to prevent rejection of her transplanted organs. There was also the fact that, though she had always been great at spelling, in the years after her transplant, she began reversing letters.

But the really strange thing was the dreams, especially an "unusually vivid" one that occurred five months after her transplant. In this dream, she "inhaled" a man whom she somehow knew was named "Tim L."

It was only a year and a half later that a series of coincidences led Sylvia to discover that her donor was in fact named Tim Lamirande. What was more, according to Lamirande's family and friends, he had been extremely energetic, hardly ever got sick, and had trouble in school, with a learning disability that made reading hard for him. As for his tastes, he did enjoy drinking beer, and he loved green peppers. "But what he really loved," said his sister, "was chicken nuggets." In fact, when he had the motorcycle accident that killed him, he had a container of chicken nuggets inside his jacket.

Claire Sylvia published her experiences in 1997, in the best-selling book *A Change of Heart*, which also recounts similar experiences had by other members of her transplant support group. And while her book remains one of the most readable, enjoyable introductions to the subject of "transplant memories," it is by no means the only source for such information.

"I'm a writer and philosopher fascinated by coincidences: those strange, enigmatic experiences that are so often personally meaningful and yet push the boundaries of what we consider scientifically possible. I have written several personal essays on the topics of relationships, spirituality, and the environment, which have appeared in Salon and Orion, among other places."

Other books written by organ recipients with strange experiences include *L'Intrus* by French philosopher Jean-Luc Nancy and *De coeur inconnu* by French actress Charlotte Valandrey. Valandrey describes very precise dreams of the car accident that took the life of her donor (who was unknown to her at the time) as well as a newfound taste for lemon meringue pie *sans* meringue, an odd preference she later came to find had been shared by her donor. In an even stranger twist, Valandrey actually fell in love with the widower of her donor, before she knew him to be such.

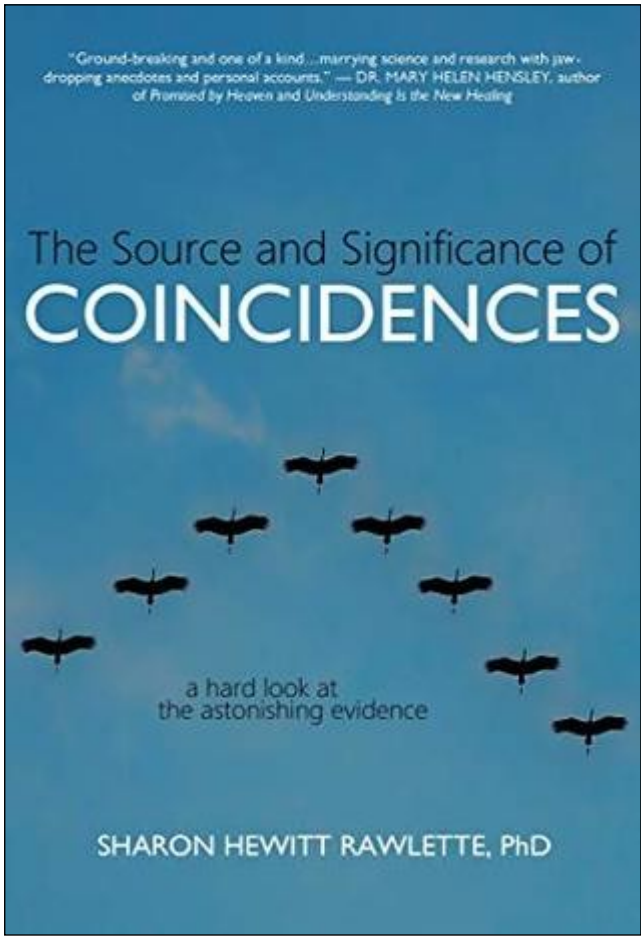
In addition to these book-length accounts, ›››

several scientific researchers have collected accounts of personality changes from large groups of organ recipients. In a study published in 1992 (Bunzel et al.), Viennese researchers interviewed 47 recipients of heart transplants, asking them if they felt the same way about themselves after the heart transplant or if they felt changed. And a Canadian study published in 2014 (Mauthner et al.) analyzed video recordings of interviews with 25 heart transplant recipients in which they were asked whether their transplant had affected how they thought about themselves or their bodies.

Some of the organ recipients in these studies brought up specific changes in personality they felt were related to their transplant. In the Viennese study, a patient reported feeling that the person they'd gotten their heart from must have been a calm person, because they were feeling much calmer, and another reported loving to listen to loud music through earphones, something he didn't ever do before. In the Canadian study, a woman said she was no longer interested in having sex with her husband and attributed this to having received a male heart.

Neither of these studies systematically compared recipients' statements about perceived personality changes with independent information about their donors, but another study published in 1999 in the journal *Integrative Medicine* (Pearsall et al.) focuses on this kind of comparison and presents 10 cases in which there are undeniable correlations between the two.

For instance: A 7-month-old boy named Carter received the heart of a 16-month-old boy, Jerry. Before Carter had ever met Jerry's father, he picked him out of a room full of people, running right up to him, climbing into his lap, and saying, "Daddy." When his mother asked him why he'd done that, "he said he didn't. He said Jerry did and he went with him." When Jerry's parents spent the night at Carter's home, Carter went into their bedroom and asked to sleep with them, cuddling between them the way Jerry used to do. He told them not to cry because Jerry said everything was okay. It is also interesting to note that Jerry had suffered from mild cerebral palsy predominantly on his left side, and after the transplant, Carter developed "stiffness and some shaking" on his left side as well.



Every now and then, we all have experiences that seem too meaningful to be chance but that we can't explain in any normal way. Now, philosopher Sharon H. Rawlette tackles some of the hardest questions surrounding such coincidences by bringing together an immense body of research (drawn from science, statistics, near-death experiences, deathbed visions, and many other extraordinary human experiences) that clearly points to a meaningful reality beyond the bounds of current science. **www.amazon.co.uk**

- A 47-year-old white man received the heart of a 17-year-old black man. His wife reported that he had become more comfortable with his black friends, inviting them over to the house for the first time, for example. He himself said that one big change in him was that he now loved classical music, playing it all the time. "I know it's not my new heart," he said, "because a black guy from the hood wouldn't be into that." Unbeknownst to him, his donor was a violinist whose friends always made fun of the music he liked.

- A 47-year-old man received a heart from a 14-year-old female gymnast. The girl's mother reported that her daughter "had some trouble with food," sometimes skipping meals or purging. She also said her daughter "had this silly little giggle when she got embarrassed." The man who received her heart developed a tendency to giggle (his brother called it a "girl's laugh") that annoyed his wife to no end. He also found himself nauseated after eating, ›››

wondering if it would help if he threw up.

- A 9-year-old boy received the heart of a 3-year-old girl who had drowned in a backyard pool. The boy's mother reported he was now "deathly afraid of the water" even though he used to love it. The boy himself said of his donor, "I talk to her sometimes. I can feel her in there. She seems very sad. She is very afraid. I tell her it's okay, but she is very afraid. She says she wishes that parents wouldn't throw away their children. I don't know why she would say that." Apparently, the girl's parents had gotten a divorce and left her alone a lot. She drowned while the babysitter was on the telephone.

A 5-year-old boy received a heart from a 3-year-old boy named Timmy who fell while trying to retrieve a Power Ranger toy that had fallen onto a window ledge. Without knowing Timmy's name, age, or manner of death, the recipient of his heart said, "I gave the boy a name. He's younger than me and I call him Timmy. He's just a little kid. He's a little brother like about half my age. He got hurt bad when he fell down. He likes Power Rangers a lot I think, just like I used to. I don't like them anymore though. I like Tim Allen on Tool Time, so I called him Tim. I wonder where my old heart went too. I sort of miss it. It was broken, but it took care of me for a while."

While there is no scientific consensus regarding the explanation for the changes observed in these transplant cases, it's very clear that something is happening that belies the simplistic view of the heart as "just a pump" and the brain as the sole arbiter of consciousness. These cases strongly suggest that some measure of personality is intimately connected with the organs of the physical body and that this bodily consciousness may be transmitted to an organ recipient in some as yet unknown way. If we continue to investigate such cases, they may ultimately provide us with some important clues regarding the nature of consciousness and its connection to the physical body.

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You can contact Dr. Sharon H. Rawlette via her website **www.sharonrawlette.wordpress.com** in order to become more familiar with her books and research.

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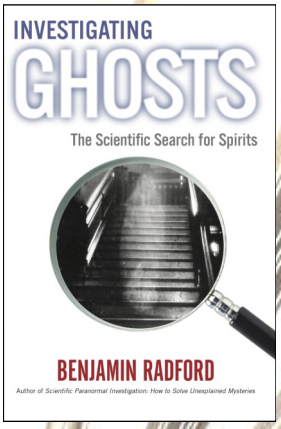

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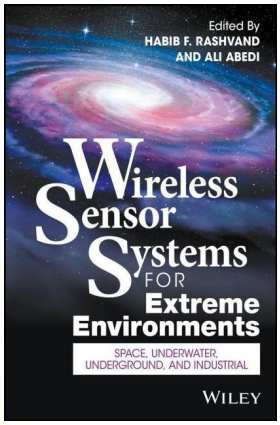

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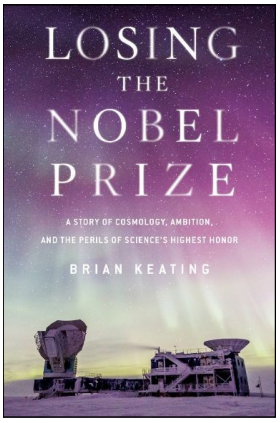

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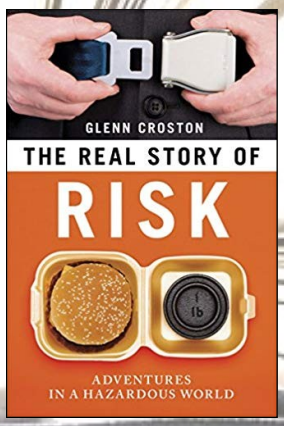

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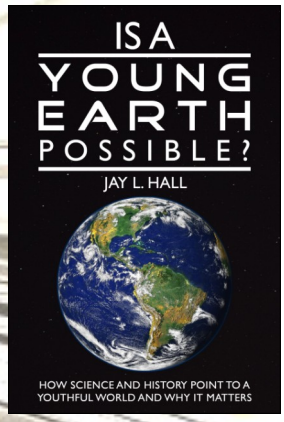

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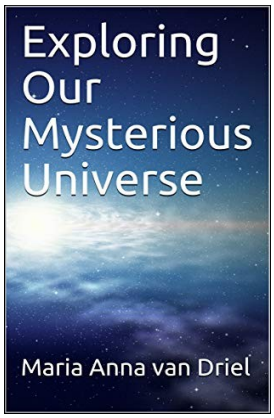

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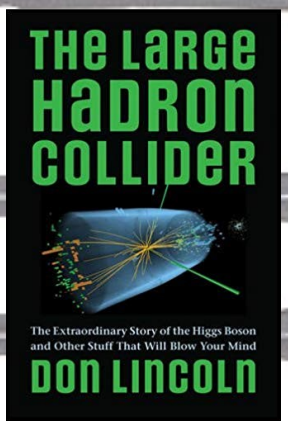

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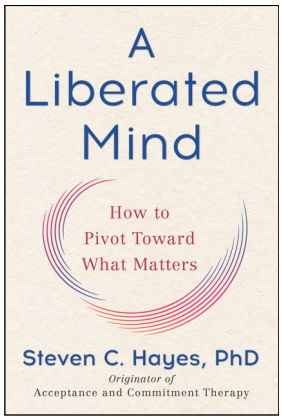

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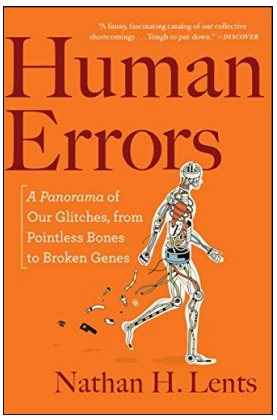

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Men as Advocates for Women in STEM!

By Dr. Adriana Bankston, www.adrianabankston.com

Power imbalances in academia are so prevalent, and women are fighting many battles. Truly changing the landscape for women to feel more powerful in academia will require the participation of various groups, and a conscious effort from men to help with this change at multiple levels. This post will describe this issue and provide a few possible solutions on how the scientific community can contribute.

When I worked at the bench, I wasn't quite aware of the gender disparities that exist in academia. My PhD advisor was a woman, and she always taught us to stand up for ourselves, and certainly prioritized diversity within her own lab. The department I worked in during my PhD was also very accepting of different genders, cultures, skin colors and origins, so I think most of us felt that our differences were celebrated.

Then, when I had enough data to go to conferences and started realizing how my work fit into that of others in the field, it was initially very exciting. These meetings were also eye opening for other reasons. I did notice that the societies I was a part of prioritized diversity and inclusion, made sure to have an equal number of women on panels, and asked women to organize events as part of society meetings.

But, increasingly, over the years, I began to realize that there were real issues with women getting ahead in academia. First of all, I realized at some point that the department in which I did my graduate work only had two female PIs, one of which was mine. But she did not let herself be intimidated by this fact. Similarly, I didn't personally experience this myself, but I did hear of many instances where men did not value the opinion of women and sought to ask the same question from their male counterparts, for example on a panel or during a meeting. This practice not only undermines the power that women have- and they do have it but it's not obvious under all these layers of oppression- but also creates an imbalance that will overtime only perpetuate this sense that women are less capable of doing something.

In addition to working at UC, Adriana serves as Vice-President of Future of Research, a non-profit organization whose mission is to champion, engage and empower early career scientists with evidence-based resources to improve the scientific research endeavor. **www.adrianabankston.com**

In the academic world, where power imbalances are so prevalent, women are fighting many battles- psychological, financial, biological, etc. Some of these can't be helped, but in cases of blatant discrimination, men also need to step up. Men who lead organizations, departments, or really any kind of group or team, need to ensure that they bring on the best and brightest minds, and the people who can get the job done, and that they do not prioritize other men purely based on gender. This can also be very damaging if the women in the group have the perception that men are being celebrated more.

So for those who want to help, what can be done?

I think this is a question that the entire scientific community struggles with, and extends beyond the walls of academic institutions, into ›››

scientific meetings, to various other groups and workplaces, and are therefore more widespread issues than just for the academic community.

The first thing to ask ourselves is why this perception exists- is it just because it's always been this way? Do men actually make a conscious effort to change this perception for themselves, and within the context in which they operate on a daily basis? Do they make sure that the women in their group have a voice and that it is heard? If a woman in the group expresses a concern of discrimination, is it being addressed?

It would be great to hear more stories from those who prioritize diversity and inclusion within their organizations, such as on their boards and in other leadership roles. It is also important to prioritize having diverse points of view from those who are not only women, but also women of color and other origins, and may thereby experience additional barriers to success.

Collecting data and stories on particular issues has proven to be a successful strategy for several organizations, and it would be beneficial to utilize this type of strategy within any group to assess internal diversity. Making sure that everyone is being heard and that there is a conscious effort to celebrating their views is really critical within any community.

Data on this topic has shown time and time again that women are being discriminated against in terms of salaries, leadership positions, and other professional opportunities. Truly changing the landscape for them to feel more powerful will require the participation of various groups, and a conscious effort from men to help with this change at multiple levels both within academia and beyond.

This post represents my personal views and not the views of my employer (University of California).

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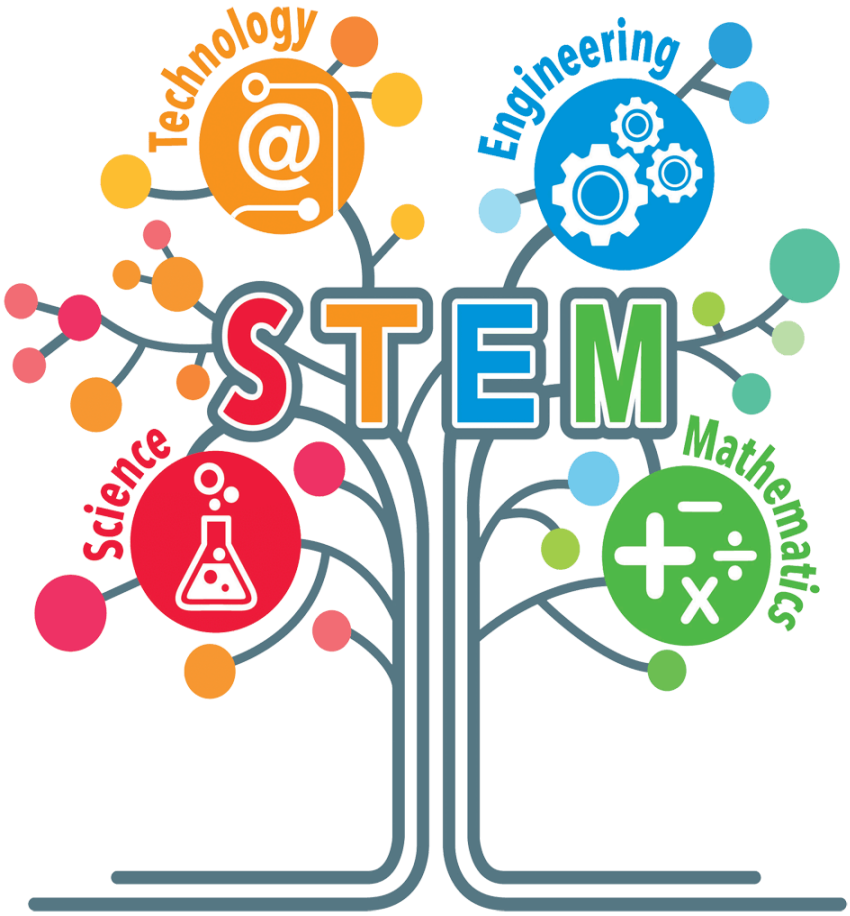
This post was originally published by the Female Scientist, **www.thefemalescientist.com**



In an ever-changing, increasingly complex world, it's more important than ever that our nation's youth are prepared to bring knowledge and skills to solve problems, make sense of information, and know how to gather and evaluate evidence to make decisions. These are the kinds of skills that students develop in science, technology, engineering and math—disciplines collectively known as STEM.

Source **www.ed.gov/stem**

How Stories About Haunted Houses Become Self-Perpetuating

By Professor Frank T. McAndrew, www.frankmcandrew.com

My recent article "The Psychology, Geography, and Architecture of Horror: How Places Creep Us Out" for *Evolutionary Studies in Imaginative Culture* delves into the question of why we find some kinds or physical spaces to be unsettling. Haunted houses, especially as they are portrayed in horror fiction and film, figure prominently in my discussion of why some places succeed so well at creeping us out.

I am interested in why a belief in haunted houses persists long after investigations of the case reveal them to be little more than a good ghost story. In other words, accounts of paranormal events are able to withstand an assault from actual facts quite well.

In no case has this been more evident than in one of the most enduring ghost stories of our time, *The Amityville Horror*, which inspired a book and a series of movies. Kevin Christopher explored the story behind this in an article for Skeptical Inquirer Magazine in 2003, and I am relying heavily on his account here.

On November 13, 1974, Ronald Defeo Jr. murdered six members of his family in his Dutch Colonial home at 112 Ocean Avenue in Amityville, New York. Defeo was convicted for his crime and sent to prison. In December 1975, the house was purchased by George and Kathy Lutz, but they and their three children lasted in the house for a mere 28 days before they were driven from their home in abject terror. A great many frightening and peculiar things happened to them during their brief stay, including plagues of flies—in midwinter! —Kathy levitating above her bed while she slept, the Lutz children beginning to sleep in the same positions in which the murdered corpses of the Defeo family had been found, green slime oozing from the walls, frequent sightings of a pig-like demon with glowing red eyes, an image of a demon burned into the fireplace, and George witnessing his young wife being turned into a hideous old hag right before his eyes. The Lutzes contacted a local priest to bless the house, and during the blessing the priest was slapped in the face by an unseen hand and he heard a loud voice warning him away.

This story frightened the bejesus out of everyone who heard it *because it was true!* Except that it wasn't.

The Lutzes' account contradicted the account of the priest who had supposedly been involved in the incident, and all of the reported creepy happenings were embellishments at best, and more often, outright fabrications. In fact, the whole thing turned out to be a ruse concocted by the Defeos' attorney and George Lutz in order to turn a profit by writing a book about the incident. The fact that the entire affair was quickly revealed as a hoax did little to diminish the appetite for a book and a movie, and accounts of the haunting in the popular press kept the legend alive by glossing over inconvenient facts in favor of telling a good ghost story. One of the most well-known of these sympathetic media stories ›››

aired on Halloween night, 2002, on ABC's *Primetime Thursday*. So, a belief in tales of haunted houses may persist at least in part because of the public's *wish* to believe—facilitated by a complicit media.

Another part of the problem is that once an individual believes that haunted houses are real, even well-intentioned individuals may hoodwink themselves into experiences that genuinely creep them out. A fascinating case study of just such a situation has been described by paranormal investigator Benjamin Radford, also in *Skeptical Inquirer Magazine* in 2008.

Radford was contacted by a terrified woman near Buffalo, New York, in November of 2003. She was completely convinced that her house was haunted by ghosts or at least by some sort of evil spirit. She and her husband were contemplating moving because they could no longer stand the tension of living in a haunted house. They had been in the house about three years, and over time they saw an increase in what they believed to be paranormal activity. She and her husband slept in separate bedrooms because of his sleep apnea, and his room seemed to be particularly haunted. He experienced tapping on his feet as he was drifting off to sleep and on more than one occasion awakened when his bed was violently kicked by an unseen force. The family pets also seemed to be afraid to enter this room.

The house was full of strange cold spots and the floors creaked throughout the night from the sounds of footsteps. They photographed the image of a demonic face on one of their tabletops, and a tape recorder they planted in an otherwise empty upstairs recorded the muffled sounds of conversation as well as animal noises. When they were downstairs, they frequently heard the sound of faint music and other unexplainable noises coming from empty upstairs rooms. The couple even summoned a priest to bless their house, but the haunting continued to get worse.

Radford, who worked for the Committee for the Scientific Investigation of Claims of the Paranormal in Amherst, New York, agreed to look into the case. He found the husband and wife to be normal, sincere people who were thoroughly frightened and creeped out by what was going on in their home.

After a few weeks of experimentation and investigation, he discovered that the couple had inadvertently, but quite literally, haunted their own house. They fed each other's fears by engaging in self-confirming "top down processing" that is guided by one's expectations. Once they believed that their house was haunted, any ambiguity that they experienced was resolved in the direction that was dictated by their fears, which in this case meant that there were ghosts running wild in the house.

The house was old, drafty, and poorly insulated. There were in fact "cold spots" that had a perfectly natural explanation, as did the creaky staircase, the mysterious music and voices, and the animal sounds. The couple had been completely unaware that sounds from people conversing on the street, dogs barking in the distance, and neighbors raking leaves filtered into the upstairs of the house and could be captured by a tape recorder.

These things only sounded sinister when one did not know their origin and when one fully expected to hear ghosts. The demonic face on the table turned out to be the reflection of a lamp. Just as people can see the face of Jesus in a puddle of oil or an image of the Virgin Mary in a grilled cheese sandwich if that is what they expect to see, the random patterns in the reflection of a lamp can indeed be perceived as a demonic face. (The perceptual experience that results from imposing order on random stimuli is known as a *simulacrum*). The tapping on the husband's feet and the shaking of his bed turned out to be nothing more than the side effects of a very large man with sleep apnea twitching and shaking on a flimsy bed while he was sleeping.

In short, whether a place seems truly haunted can very much be in the mind of the beholder.

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Prof. McAndrew's essay on haunted house stories was first published on the blog of *Evolutionary Studies in Imaginative Culture* **www.esiculture.com**

Offshore and Onshore Oil and Gas Drilling; How Drilled Oil From Harsh Environment Reaches our Cars.

Derrickman Yusnadi Usman Weighs In

By Maria Anna van Driel, www.nextttruth.com

Remember the biographical disaster movie 'Deep Horizon'? An oil drilling rig operated by private contractor Transocean is set to begin drilling off the southern coast of Louisiana on behalf of BP. At first, the operation goes smoothly, but the cement job eventually fails completely, triggering a massive blowout that overpowers and kills the drill team members. As night falls and the burning oil lights up the area, the Coast Guard becomes aware of the incident and sends a ship to collect the survivors. With all lifeboats full chief Electronics Technician Michael Williams locates the emergency life raft, but it becomes separated from the rig before he and Andrea can board.

Fortunately, these kind of disasters are not a common event due to the fact of the implementation of robots that are navigated by trained male and female engineers who are drilling for gas and/or oil on rigs, on drill-ships or during onshore drilling. But that does not alter the fact that it is still a profession in which life-threatening dangers arise every now and then.

The majority of the people have this typical image of men smeared with oil and working with heavy tools while fighting the rough wimps of the sea as soon as the job description of oil and gas drillers is being mentioned. But there have been a great deal of changes in the oil and gas industry ever since the first successful oil well in North America was established in Oil Springs, Ontario, Canada in 1858.

How does a company go about finding oil and pumping it from the ground? Derrickman Yusnadi Usman (45), born in Langsa in Aceh Province on the island of Sumatera (Indonesia) weighs in of this question. As an off- and onshore oil driller for the company Offshore Vantage Groups, Mr. Usman has enjoyed significant job satisfaction during the past 20 years working in the oil industry, developing and refined his skills and knowledge, especially with regard to a myriad of drilling operations.

Being strongly committed to furthering safe work practices and the increasing coherent communications between Department Supervisors, Mr. Usman, husband and father of two, displays strong organization and leadership abilities what reflects in his close and energetic work relationship with colleagues.

Welcome Mr. Usman, I appreciate the time you took for letting us peer into your career as a Derrickman within this amazing job of onshore and offshore oil drilling.

Q: Can you tell a little bit about yourself? Who is Yusnadi Usman?

Mr. Usman: I was born in Langsa (1971) in Aceh Province on the Island of Sumatera (Indonesia) and I am the father of two children. I have been working on international drilling onshore and offshore platforms for the last 20 years. In order to promote natural products of Aceh and my home town, I am also a member of Harley Davidson Club which touring Sumatera regularity to promote Coffee Gayo, souvenirs, snacks made by my lovely wife. You will find more information about the organic coffee, for instance, on my website. **www.cafe-truck.com**

Q: What inspired you to become interested in the oil industry?

Mr. Usman: The challenging occupation of the colleagues working at Arun gas field in the 90's has inspired me to join the drilling industries. ›››

The Arun gas field which was discovered by Mobil Oil Corporation in 1971 is located Lhokseumawe Aceh near my home town Langsa (Indonesia).

Q: How does a typical day looks for you?

Mr. Usman: It depends on the weather and location. Typically it is a continuous operation whereby I work 28 days in a row on board of the drill-ship. (12 hours a day, at 12:00 to at 24:00 for two weeks and at 24:00 to at 12:00 for two weeks also) During that time, I shall live on the ship.

Q: How does one become a Derrickman and what are his/her are responsibilities?

Mr. Usman: In order to become a Derrickman one requires years of experiences and training with certificate. The responsibility of the Derrickman is to keep the drill platform in a balance having a close communicating with the captain. There are 4 mud pumps located in the pump room which shall be controlled during the drilling activities. This also prevents the drill bit to get stuck in the wellbore. The chemical (drilling mud) is constantly being observed to avoid blow out because of gas leakage.

*With Mrs. Rahma (left) the owner of **Ketiara Coffee Gayo** who has been fighting for the last 30 years in Takengon to push for Faitrade and Organic coffee to increase local farmer economy. This made Coffee Gayo international. USDA-NOP, EU (ID: 818070) and FLO Fairtrade (ID: 27501).*

Q: Every now and then you are flying with a chopper to your work which I find personally really cool. Have you ever flown to your work experiencing extraordinary moments?

Mr. Usman: There was a challenging moment whereby the pilot had to land the chopper during bad whether. The adrenaline increased during rough sea wave and storm which makes this job really cool for me.

Q: What is the difference between onshore and offshore drilling?

Mr. Usman: Offshore means I have to move to different countries to perform the drilling activities. While onshore means the drilling is around the shore of the same country.

Q: Are there also woman working in your team? If not, why? If so, what are their responsibilities?

Mr. Usman: Sure there are women working on the offshore drilling operation but most of them don't have kids and still were very young. Most of the woman are engineers, less are working as cleaners and in the catering. In a nutshell, it all comes down to the carrier choice of the woman herself.

Q: What are the most common activities on a drill ship?

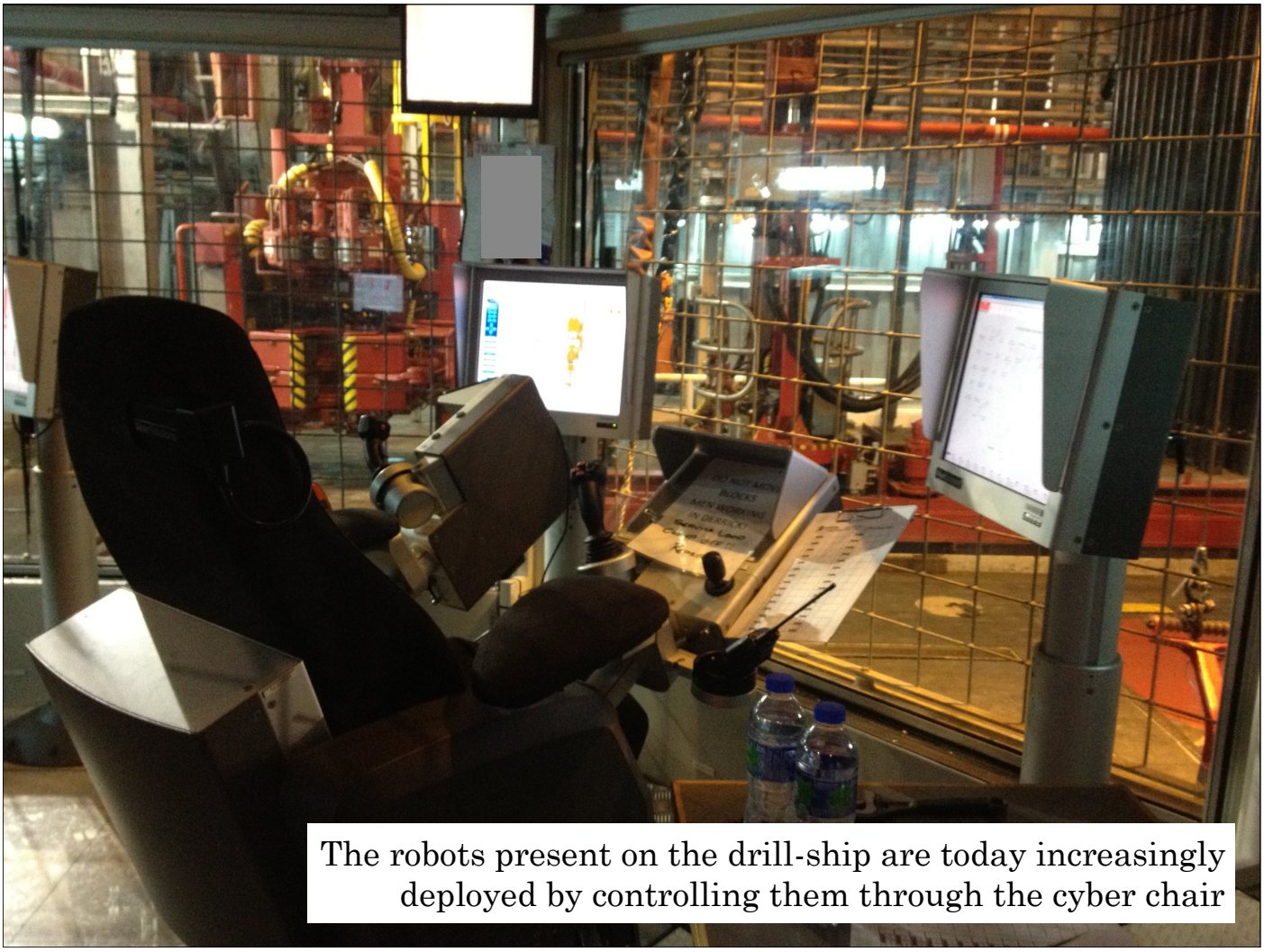
Mr. Usman: Since we have WiFi on the platform, most of our spare time is spend to communicate with the family and sleeping. Of course we always have fresh food like meat, fruit and vegetable shipped in regularly.

Q: Which technologies are used with onshore and which with offshore drilling?

Mr. Usman: The robots present on the drill-ship are today increasingly deployed by controlling them through the cyber chair. Most of these robots are manufactured by Aker Solution and National Oil Well Varco. This creates less dangerous situations for the crews as well as it makes life on a rig and drill-ship much easier compared with the same activities 20 years back.

Q: How is it determined where to drill?

Mr. Usman:
Actually before drilling, we have to use ultrasonic equipment to determine the drilling site, but the responsibility to determine where to drill lies with the Directional Driller. The engineers are the one who steer the well and it shall move to the right direction otherwise we are going to lose millions of dollars. It is really a precision work in which you have to focus well. ›››



The robots present on the drill-ship are today increasingly deployed by controlling them through the cyber chair

Q: How much does it cost to drill for oil?

Mr. Usman: The daily estimation for drilling one hole is between 10.000 – 18.000 dollars. This depends on types of oil rigs and drilling equipments.

Q: Can you describe this process of how drilled oil from harsh environment reaches our cars?

Mr. Usman: It is actually a long process, but I will explain briefly. The process starts with spudding (the process of beginning to drill a well). A 36 Inches diameter casing (the back bone of the well) is forced 100 meters in to the sea floor. Several smaller casing (a series of steel pipes that are run into a drilled oil well) are inserted deeper and are cemented to the bottom of the sea bed.

A Blow Out Preventer (B.O.P) is then lowered to secure the drilling process. The drill process is started by using drill bits, drill collars, drill pipes, turntable and derrick to cut through the rocks under the sea. When everything goes as planned the speed of oil and gas from the casing shall be flown out in a controlled manner. This cured oil/gas then will be stored on the platform before shipped to the oil refinery. The refined oil is distributed to the gas stations for the car users to purchase.

Q: Which Company are you working for at the moment and has it done research to determine the effects of discharges on the marine environment?

Mr. Usman: Offshore Vantage Groups is an offshore drilling contractor that operates and manages a fleet of modern, high specification drilling rigs on a worldwide basis. It owns and manages fleet currently consists of three ultra-deep-water Drill-ships and five premium BMC 375 Jack-ups (a mobile platform that consists of a buoyant hull fitted with a number of movable legs, capable of raising its hull over the surface of the sea). It also provides construction and preservation management services for other vessel owners. ›››

Offshore Vantage Groups is operated on highly respected business ethically and in compliance with all applicable U.S. and foreign laws, including prohibitions against corruption. Every employee, officer and member of our board of directors is expected to uphold Vantage's commitment to ethical business practices and regulatory compliance. This means conducting business in accordance with the spirit and letter of applicable laws and regulations, and in accordance with ethical business practices.

We follow strict Guidelines for Offshore Oil and Gas Development which includes: Air emissions, Wastewater discharges, Solid and liquid waste management, Noise generation (including underwater), Spills, Energy efficiency and resource conservation

Q: What kinds of waste materials can be produced during offshore oil (and gas) exploration or production activities?

Mr. Usman: There are some contamination levels that shall not be surpassed by the guidelines which include: Organic Phase Drilling Fluid concentration lower than 1% by weight on dry cuttings, Non Aqueous Phase Drilling Fluid (NAF) 6.9%, Hg: max 1 mg/kg dry weight in stock barite, Cd: max 3 mg/kg dry weight in stock barite

The well is created by drilling a hole 12 cm to 1 meter in diameter into the earth with a drilling rig that rotates a drill string with a bit attached. After the hole is drilled, sections of steel pipe (casing), slightly smaller in dia-meter than the borehole, are placed in the hole.

Q: Which wastes generated from offshore oil (and gas) exploration and production activities may be discharged into the ocean?

Mr. Usman: It is allowed discharging oil and grease into the sea when its content does not exceed 42 mg/L daily and maximum; 29 mg/L on a monthly average. An environmental risk assessment to determine the maximum site-specific allowable concentrations should be conducted for all other chemicals.

Q: What regulations govern the discharge of wastes produced by onshore and offshore oil exploration and production activities?

Mr. Usman: There is an international convention for the Prevention of Pollution from Ships (known universally as MARPOL) which was adopted in October 2008, which entered into force on July 1, 2010. www.imo.org

Q: What would you say is a moment in your career that stands out as most meaningful?

Mr. Usman: The most meaningful moment in my career is when the oil price reached its peak 143 USD per barrel on 3rd of July 2008. Everybody was very happy and it created an endless feeling of satisfaction and pride in our occupation.

Q: What was the biggest challenge you have experienced during your 20 years of oil-drilling?

Mr. Usman: In the past most of my activities require a lot of climbing what increased the risk of deathly accidents with the crew. Except for this being a really dangerous activity, it also cost a lot of money to transport crew members as fast as possible to the nearest hospital with the chopper when being injured.

Q: What holds the future for your career?

Mr. Usman: Actually, the future is bright since the offshore drilling market is expected to grow of almost 9% during 2019-2023. This is due to the rising demand for oil from recent emerging industrial countries such as India, Indonesia, Vietnam, Thailand and some African countries.

Q: Mr. Usman, thank you so much for this interview. I am sure it will be an inspiration to many. ›››

A drillship is a marine vessel designed for use in exploratory off-shore drilling of new oil and gas wells or for scientific drilling purposes. Drillships were first developed in the late 1940s by marine architects but in most recent years these vessels have been equipped with the latest and most advanced dynamic positioning systems.

Do you have any additional advice you can give for aspiring oil and gas drillers who want to obtain a career in drilling on a rig, a drill ship or onshore?

Mr. Usman: You are welcome Maria. Oil drilling is a real cool profession for young people who like the challenge and to travel, sometime around the world. It creates a window of opportunity in meeting people on an international level. Beside that, it is a profession that provides relatively high and stable income.

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Find out more about Mr. Y. Usman and his work as a Derrickman via his LinkedIn profile. If you like to read about his business and hobby with Coffe Gayo, **www.cafe-truck.com**

PRI-UK in the Spotlight
Nick Howe Weighs In

By Maria Anna van Driel, www.nexttruth.com

I was driving my motorcycle, than…a car. I hid the streets. I answered 'yes'. I was reborn.

We all know the movie Ghost Rider in where motorcycle stuntman Johnny Blaze (Nicolas Cage), finds his flesh consumed by hellfire, causing his head to become a flaming skull, whenever evil roams. Riding a fiery motorcycle and wielding blasts of hellfire from his skeletal hands, Johnny eventually learns he has been bonded with the demon Mephistopheles (Donal Logue) to whom he sold his soul to save the life of a loved one. He has become an avenging agent of demonic justice.

The oldest representation of the Christian idea of the devil may be this sixth-century mosaic in the Basilica of Sant'Apollinare Nuovo, Ravenna, Italy. The blue figure may be Lucifer. Unlike later depictions, he is beautiful and radiant, not the horned, hoofed, red monster as we know him today. The color of the holy kingdom in the sixth century, red became associated with hellfire and the devil in later centuries.

Even this being a movie, it seems that some people are making real attempts in sealing a, in blood written, contract with demonic forces from the deepest debts the Earth possess and goes by many names. What is so appealing about making a compact with this ancient creature from the shades below and release a psychological Armageddon? Why do some people pray to God in time of need and others consider offering their soul to the Devil in exchange for diabolical favours? Favours which only seem to avail the Devil and brings you nothing except for eternal damnation.

But how real is this fiery beast described in Dante Alighieri's inferno, lived by Johann Georg Faust, used by William Shakespeare in the play 'Macbeth' and feared by Leonardo Da Vinci as he was fighting his demon 'time'. Who or what is this personification of evil playing a noble knight, understanding the balanced melodies in the speech and the teachings of poetry what is causing you to ride with him? Is this creature the illusion of a passionate knight, sharing with you the beauty of infinity what is mirroring his emporium?

The figure of Satan has been a standing puzzle in the history of religion. Where did this 'figure' originate? And, what is its role? I guess it depends on whom you ask. Still, many ancient religions have scriptures detailing the struggle between good and evil. For instance, in the Zoroastrian religion, an ancient Persian religion and is believed to be one of the worlds earliest, the supreme deity, Ormazd, created two entities: the chaotic and destructive spirit Ahriman and his beneficent twin brother, Spenta Mainyu.

In Sumerian and Akkadian mythology Hanbi, or Hanpa, was the god of duality and the father of Pazuzu and Humbaba. Pazuzu, or the ZoZo demon, is an Assyrian/ Babylonian demonic god who was most popular in the first millenium BCE. This demon is often depicted as a combination of diverse animal and human parts. He has the body of a man, the head of a lion or dog, talons of an eagle, two pairs of wings, and a scorpion's tail.

The term "demon" in the modern day always carries with it the connotation of evil but this was not so in the ancient world. The English word "demon" is a translation of the Greek word ›››

daimon which simply meant "spirit" and could be good or evil, depending on its intentions and the results of a visitation. In ancient Mesopotamia, as in other cultures of the ancient world, demons were often sent by the gods as punishment for sin or to remind one of one's duty to the gods and others in one's community. Demons were not always evil and even those who were, were still capable of good deeds.

Nevertheless, Pazuzu is the most famous Mesopotamian demon in the present day and likely the only one people have ever heard of, and the only Mesopotamian demon to have starred in a movie - *The Exorcist*. If this well known ancient evil force, what has allegedly harassed hundreds via Ouija boards, is manageable when it steps in our reality is up to the myriad dimensional researchers.

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"I regularly play guitar at folk clubs and bars, therefore hoping to develop powers of telekinesis that can make the guitar play by itself! Joking, but it would be fun to sit in the audience and watch it."

Welcome Nick, I appreciate the time you take for letting us peer into your career as a paranormal investigator and some of your theories and research within the field of the paranormal.

Q: You are a team member of PRI-UK. Will you tell us a little bit about yourself? Who is Nick Howe?

Nick: I am a keen motorcyclist, for already 44 years, I love playing bottleneck blues on guitar, which gave me the name 'Nick the Slide', and fishing. Also, occasional ghost hunter, a committed student in the school pessimism and a bar room philosopher of which the latest musings are on how artificial intelligence will affect the way people will perceive the paranormal.

But without wanting to sound flippant, I'm not sure that I know. I don't think about it and just get on with things my way. People are more than welcome to judge my thoughts and deeds so I'll leave it to them to decide who or what I am.

Q: What is your position with PRI-UK?

Nick: As the group name suggests we are both investigators and researchers, we seek out locations or people find us. Nick Terrell has a whole list of contacts so once he's got a site lined up I deal with the paperwork and organisation. Where people find us Andy and I will deal with it on a 50/50 basis much in the same way as our written output and research.

Q: When did you first become interested in the paranormal?

Nick: At a very young age, under 10 hears for sure. My mother developed an interest in spiritualism and faith healing and that had a profound impact. I can also remember my parents and friends regularly getting together and the topic of the paranormal cropping up.

Quite honestly it scared me so I suppose in later life and in light of my own experiences it was only natural to revisit that fear and rationalize it.

Q: What is the most hilarious or scariest moment you have experienced during an investigation?

Nick: During one investigation in a school hall I tripped over the edge of the stage in the pitch black, I rolled over and eventually came to rest under a grand piano. Not particularly funny but the audio recording captured a stream of profanities that would make Satan blush coupled with the unbridled mirth of the rest of the team made it a moment of pure farce.

Q: Do you think modern science will soon find proof for the existence of the unexplained?

Nick: I'd like to think so, if not then science will be failing human kind. Unfortunately, science seems to be shackled by dogma, it's hilarious ›››

to hear a celebrity professor publicly state there are no ghosts. Ironically the statement was not backed up by "good" science or even consideration as to what a ghost may be.

Q: What's the best advice you can give for aspiring investigators who want to explore the mysteries of the still unknown realms of the afterlife?

Nick: Throw out the b*llsh*t kit.

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Exploring Our Mysterious Universe

by Maria Anna van Driel

www.amazon.com