

# The REALL News

The official newsletter of the Rational Examination Association of Lincoln Land

*"It's a very dangerous thing to believe in nonsense." — James Randi*

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## The Physics of ESP, Part 3

by Robert Novella

In part one of this article I discussed the fundamental forces of nature and examined whether they can account for the claims made for extrasensory perception (ESP). It turned out that none could account for it, not gravity, not electromagnetism, nor any of the nuclear forces. Either they are too weak or too short ranged to be considered as viable explanations. In part two of this article I discussed ostensible support for ESP by Quantum Mechanics (QM) and human physiology. As weird and counterintuitive as QM is, it cannot be used to justify the claims made by proponents of ESP. Human physiology also fails to produce the elaborate and specialized organs that we would expect to exist if e.s.p existed.

Throughout this article I have implicitly used the term ESP for communication from one mind to another outside of the normal sensory channels. This definition, often called telepathy, is what is most commonly assumed when the term ESP is used, but there are other words that fall under the rubric of ESP, each with meanings different from telepathy. The most common are clairvoyance, precognition, and telekinesis. Each of these will be discussed in turn and shown to be as bereft of scientific feasibility as telepathy.

Clairvoyance involves acquiring knowledge about an object or event without the use of our normal modes of perception. This is very similar to telepathy, which involves mind-to-mind transfer instead of object-to-mind. Please read parts one and two of this article for an in-depth discussion of this type of phenomena. I will make one point about clairvoyance, however. At least with the idea of telepathy one mind creates the information signal and another picks it up. I'm even more skeptical about clairvoyance because the information is improbably sent by innocuous objects like a watch or piece of clothing.

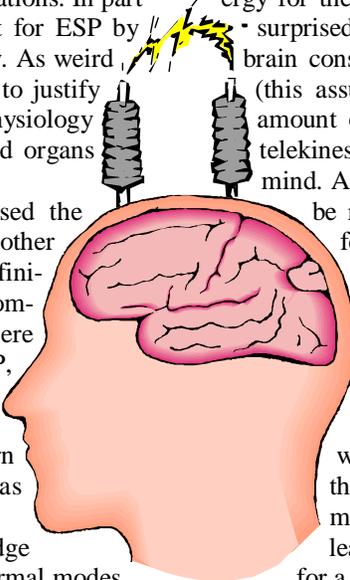
Telekinesis, or psychokinesis, is the ability to move or influence an object using only the power of the mind. Purists do not consider telekinesis to be part of ESP because it does not involve any form of supernatural perception. They consider it part of "psi" which is a more general term for paranormal abilities involving the mind. However, most people consider telekinesis to be a form of ESP, perhaps because it represents influence at a distance. Regardless of the semantics, telekinesis is a widely believed "power" of the mind and I believe it fits in well

with my discussion.

It is very compelling to think that with a mere thought we could move an object. Some argue that the brain can accomplish many amazing feats, and there remains a great deal to be discovered about it, so is it too much to ask for the brain to move an object by itself? It might seem trivial in terms of energy for the brain to move a small object but you might be surprised just how much energy is required. The average brain consumes about 25 watts<sup>1</sup> or 6 calories per second (this assumes a 2400 kilo-calorie diet). Let's see what amount of energy would be needed for a simple act of telekinesis in which a pen is moved by the power of the mind. Assuming the pen weighs four ounces, what would be required by the brain to move such an object a few feet into the air in about a second? A spherical field produced by the brain would need a 100 kilowatts of power in order to move a pen that is a few feet away<sup>2</sup>. This is similar to a modest radio station. If the power could be focused into a laser-like beam with modest dispersion then the power requirement could be reduced to 100 watts which is equivalent to the power output of the entire human body. Therefore, the simple act of moving a pen using telekinesis would require, at least, the entire energy output of the human body for a brief period of time.

The brain normally consumes about 20% of the body's energy production. In order for the brain to increase its power output to 100 watts, blood flow to the brain would have to increase by a factor of 4, and the body would have to increase its total energy production by 60%. This is equivalent to a moderately vigorous exercise. This is all assuming that the brain is capable of producing and focusing a coherent beam of energy with a high degree of efficiency (a completely separate and non-trivial problem). Therefore, a telekinetic engaged in the

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## Purpose

The Rational Examination Association of Lincoln Land is a non-profit, tax-exempt 501(c)(3) educational and scientific organization. It is dedicated to the development of rational thinking and the application of the scientific method toward claims of the paranormal and fringe-science phenomena.

REALL shall conduct research, convene meetings, publish a newsletter, and disseminate information to its members and the general public. Its primary geographic region of coverage is central Illinois.

REALL subscribes to the premise that the scientific method is the most reliable and self-correcting system for obtaining knowledge about the world and universe. REALL does not reject paranormal claims on *a priori* grounds, but rather is committed to objective, though critical, inquiry.

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## From the Chairman

David Bloomberg

Well, we were supposed to have our second annual REALL picnic on Saturday June 8, but we ended up canceling it due to lack of turnout. It seems we could not have possibly picked a worse day to have a picnic! Just about every high school and junior high in the area had graduation this weekend, plus there seemed to be loads of other activities going on as well. Personally, I was invited to three other activities after we set the date for the REALL picnic! It also didn't help that we didn't give people a whole lot of advance notice.

So we're going to try it again later in the summer. Watch this space for more info, because we're not sure exactly when yet.

## No July Meeting

However, I can tell you that we're not going to be meeting on July 2, which is when our usual schedule would put us in the Library. First of all, it's the week of Independence Day and I suspect we will have lots of people on vacation. Second, I won't be able to make it. Third, we don't have a speaker. So all around it seemed a good idea to cancel it.

## August?

In all likelihood, August will be when we have the picnic. Again, watch for more info.

## September

Ah, but we do have something planned for September! Professor Karen Bartelt will be coming to talk to us about the Intel  
(*"Chairman" continued on page 4*)

## A Nod to Our Patrons

REALL would like to thank our patron members. Through their extra generosity, REALL is able to continue to grow as a force for critical thinking in Central Illinois. To become a patron member of REALL, please use the membership form insert. Patron members are:

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(*"The Physics of ESP" continued from page 1*)

activity of moving even an object as small as a pen should experience an increased heart rate and breathing as if they were engaged in moderate exercise. Lifting two pens would require athletic conditioning, and anything heavier than that would be beyond the means of normal human physiology.

Perhaps we can tap into an external source of energy thereby removing any of the seemingly insurmountable problems associated with using biochemical energy. One such possibility is a form of energy called Zero Point Energy that exists everywhere, even in that paragon of nothingness, a vacuum. Quantum mechanics has conclusively shown us that a vacuum cannot be pure nothingness, it is suffused with unseen energy that constantly surrounds us. This stems from Heisenberg's Uncertainty Principle which states that there is a fundamental and irremovable level of uncertainty encountered when measuring systems on the atomic level. Variables like position and momentum cannot both be precisely known with arbitrary accuracy. The more accurately we know one the less we can know the other. If one is known with absolute precision then we can know nothing about the other. This not only applies to position and momentum but more generally to energy and time. Thus the value of the fields that pervade space like the electromagnetic or gravitational fields and their rate of change over time also cannot both be precisely determined. Therefore the value of such a field cannot be zero because then its rate of change would also have to be zero, and this is not possible. Consequently, at time intervals close to zero, energy can approach infinity. This leads us to the inescapable conclusion that space is seething with so called virtual particles that appear from nothing, survive for the briefest moments (about  $10^{-23}$  seconds), then disappear into the nothingness from which they appeared. This energy, also called vacuum energy, is not merely the idle speculation of an obscure principle of physics. The Uncertainty Principle has remained unassailable and bullet proof throughout the seven decades of its existence. Its predictions about Zero Point Energy are evident in the unavoidable noise encountered in electronic circuits. Even fluorescent lighting could not exist were it not for the random fluctuations of energy of the vacuum state.

Could this ubiquitous Zero Point Energy be the power source behind an apparent telekinetic effect? Unfortunately this option suffers the same problem that plagues biochemical energy, namely lack of sufficient energy. Even if we could somehow tap into this energy (another big problem) there does not seem to be enough to make it practical. Some scientists believe that if this energy could be harnessed it would end all our energy problems once and for all. Although estimating how much of this energy might exist is problematic, evidence is lacking to support this contention. Nobel prize-winning physicist, Steven Weinberg, estimates that within a volume the size of the earth there is an amount of zero point energy equivalent to only a gallon of gasoline. To lift a pen would require utilizing the amount of Zero Point Energy found in ten billion cubic meters of space, roughly a cube three kilometers on a side<sup>3</sup>.

Precognition is very different from telekinesis but it is similar to telepathy in that information would have to travel through space in order to be perceived by the brain. But, because precognition involves the perception of future events, this

information would have to travel through time as well. We shall see that this introduces a host of new problems that are peculiar to this form of ESP.

The concept of time travel (to the future) received firm scientific backing with the development of Einstein's Special Theory of Relativity in the early part of this century. This amazingly successful theory predicted that time was not an absolute as Newton believed. Rather its passage can be dramatically different for two objects moving at high speeds relative to each other. It has been conclusively demonstrated, for example, that subatomic particles accelerated to appreciable fractions of the speed of light survive far longer than they otherwise would have. This "time dilation" effect essentially slows time for speedy travelers compared to their partners back home. They therefore move into the future at a pace quicker, from their point of view, than the usual one second per second. Because of the mountains of evidence supporting this phenomenon there is not one reputable physicist alive today that doubts that space travelers on a high speed journey would return to earth younger than their former contemporaries.

If traveling into the future is possible then perhaps information can somehow be retrieved from the future and be perceived by the human mind. A problem arises with this scenario, however, due to the fact that once this information is attained it would then have to travel back in time so that we can perceive it. Physicists agree that traveling back in time is not possible under ordinary circumstances. There has been some speculation that black holes and worm holes might offer a method for traveling into the past, but they represent extreme conditions which cannot exist on Earth. Black holes are the infinitely compressed remnants of super giant stars, where gravity is so intense that even light can't escape. The problem with black holes is traveling to one and hoping you're not turned into spaghetti by the tidal forces. Worm holes are hypothetical tunnels through highly curved space that might connect distant regions of the universe. Some scientists believe that if one end of a wormhole is accelerated to a high velocity compared to the other end then traveling through it might offer access to the past. As you can imagine, even if this were true, the engineering problems would be formidable. In addition, the tunnel's existence would be so fleeting that it would collapse on you while you were traversing it. Some propose that the mouth of the wormhole could be propped open with matter that has enormous negative pressure. Finding this so-called "exotic" matter might be an insurmountable problem, however, since no evidence or theory suggests that it might exist.

If this doesn't make time travel into the past difficult enough, consider the paradoxes that can be produced. The canonical example is called the grandfather paradox. If I travel to the past and inadvertently kill my grandfather before my mother was born then I would never be born. (yes, I know, tenses are difficult when discussing time travel) But if I'm never born then I can't travel to the past to kill my grandfather? If grandpa doesn't die, then I will be born and I will kill him. Therefore if he survives he also dies. The only way to resolve this is to invoke alternate and coexisting realities or timelines. If this is the case then this isn't really time travel, is it.

Perhaps ephemeral information doesn't suffer the con-

(*"The Physics of ESP" continued on page 7*)

## Author Looks at Ideas at the Frontiers of Science by David Bloomberg

Is reality stranger than fiction? Sometimes, though not nearly as often as believers in many of the phenomena you'll see discussed in this newsletter would like us to think. But there is no doubt that the newest theories and hypotheses of physics are stranger than almost anything even the best science fiction writer or UFO believer could dream up. Yet some or all of them might turn out to be true.

Marcus Chown has spoken to a number of the scientists who have put themselves out on the frontier of science and compiled their ideas into the new book, *The Universe Next Door: The Making of Tomorrow's Science* (Oxford University Press, \$26).

Chown admits that some of the ideas "may seem crazy." But there are many ideas that scientists today take for granted that seemed "crazy" a relatively short time ago. For example, a few decades ago, who would have thought that electrons, light, and other basic building blocks of the universe would have the characteristics of both particles and waves? Who would have thought that time slows down for people moving at high speeds?

"Nature is under no obligation whatsoever to respect our sensitivities and behave in a way that appeals to everyday common sense," Chown says. Indeed, that concept is repeated several times by different scientists throughout the book. Just because we may not understand or particularly like what one theory says is not a valid reason to throw it out; we need to go wherever the evidence may lead. But that is the key – the evidence. Believers in paranormal phenomena could easily try to take some of the statements in this and the previous paragraph out of context and say this book and, indeed, this review supports their ideas. Nothing could be further from the truth. The proper perspective is that evidence may point us in directions we did not expect to go. It may present us with strange new ways of looking at the universe. But always we must start with that evidence – an area in which the paranormal is seriously lacking.

With that in mind, the author did not just go find the nuttiest professors – all of the discussions here rely on evidence, though some certainly have more than others.

Topics presented include areas of the universe where time runs backwards, the possibility that there are an infinite number of realities determined by different quantum "decisions," fundamental particles that exist outside of time, the existence of a fifth dimension (or more) in addition to the normal four of space and time we're accustomed to, life-filled planets wandering between the stars, dark matter made up of refrigerator-sized black holes that populate much of the universe, "mirror matter" that is completely invisible to us, and much more.

Each of the twelve chapters takes up one of these ideas and explains both the evidence and the speculation involved – the reader should have no doubt, many of these include a good dose of both. Some ideas, such as particles that are actually miniature time machines, have less in the way of evidence going for them than others, such as string theory.

In a few cases, the scientists pile a bit too much speculation into their ideas. For instance, one suggests that it might have been a "mirror matter" asteroid or comet that caused a huge blast in Tunguska (Siberia) in 1908, which flattened trees for miles around but left no crater or other obvious evidence of a culprit. It is called mirror matter because "it is like ordinary matter reflected in a mirror," except it is invisible. However, scientists have explained the Tunguska blast quite well with a plain old regular matter asteroid – there is no need to create a new bogeyman.

But most of the time they stick to fairly solid ground. Certainly, all of the hypotheses here will not turn out to be true. Some of them even seem to contradict one another. This is in great part because all of the evidence is not yet in. As our technology gets better, we will gain more information that will either prove these theories right, wrong, or subject to further refinement.

For example, right now we have almost no way to find a planet roving through space unattached to any star. Eventually we will have telescopes that can do that, and we will be able to determine if the universe is populated with such roaming bodies. Similarly, as our particle physicists gather more evidence, they will better be able to determine which theories about time and space make sense.

Until then, the theorists continue making predictions – which is the way of science – and hoping those predictions will be borne out by the next wave of information.

Chown has put together a good overview of these different ideas. One minor complaint is that, because he hits on similar topics in different chapters and each chapter is written as if it were a stand-alone article, there is some repetition. For example, black holes are explained several times over.

But overall anybody who is attracted to new ideas of where science might be going will find this book of interest. Just remember to separate the speculation from the facts.

*[A shorter version of this article originally appeared in the State Journal-Register. It is printed here with permission of the author.]* ♡

*("Chairman" continued from page 2)*

igent Design movement, some history, some deceptions, and the like. This should be Tuesday, September 3 (back to our usual first-Tuesday schedule), so plan for it now! A few months back we had a meeting in which we discussed how we could fight against the local creationists, and this meeting is one of those ways.

In closing for this month, I hope everybody has an enjoyable summer, and we'll see you at the picnic whenever we get it rescheduled! ♡

# Odds Are Good that Readers Will Like This Book

by David Bloomberg

What are the chances that the lottery ticket you buy today will win you millions of dollars? On the flip side, how likely is it that you will be audited by the IRS? If you've ever considered the likelihood that any of a variety of occurrences would happen to you, *What Are the Odds?: The Chances of Extraordinary Events in Everyday Life* (Prometheus Books, \$21), by Jefferson Hane Weaver, is a must-read. Indeed, this book should be read by many in the general public, who often seem to have little understanding of the kind of statistics used every day.

While money is one of the interests addressed by Weaver, it is by no means the only one. Death is by far the most-discussed topic, with sex and romance coming in second.

What are the chances you'll be killed by a meteor? Or drop dead at work? How likely is it that you'll find the perfect mate? Or that you'll have extramarital sex? Weaver looks at all of these with a combination of wit and easy-to-grasp explanations.

The author knows that the topic of statistics is not one that most people will necessarily want to read about in their spare time. As he says in the Preface, "When asked if they would be interested in learning more about statistics, most people will cringe as though they were in the presence of an insurance salesman. Yet the subject is fascinating and, when properly explored, can provide hours of amusement and entertainment."

While this may seem difficult to believe at first, any reader picking up this book would be hard pressed to disagree. Weaver manages to briefly explain concepts without the difficult equations or terminology we recall (or have forgotten) from math class – and does so in such a comedic fashion that the entertainment value outweighs the fear that we might accidentally learn something. Indeed, skeptics would do well to adopt a similar format when discussing probabilities and other related topics that often come up when addressing concepts as varied as evolution and predictive dreams.

The book begins with relationships. As an example of Weaver's humor, there is a long discussion about how to find the perfect mate out the entire world population. In the end, he concludes that there is likely more than one "perfect" match for everybody, so we don't have to spend every waking minute in our search to find him or her. Good, because that gives us more time to read this newsletter.

However, what if you should want to expand your horizons beyond that one perfect mate? Presuming your significant other is amenable to the idea, Weaver discusses these probabilities. While for a given individual, the likelihood of finding even one partner, let alone multiples, may be lower than his or her chance of ending up crushed by a passing asteroid (everybody knows somebody like this), Weaver explains in his humorous way how

a proper cross-section of the population might be obtained to determine the overall odds.

In his section on "Death, Disaster, and Mayhem," Weaver helpfully provides a table that shows the diameter of an incoming meteor, its equivalent force in megatons, the area it would destroy, and the frequency of such hits on the Earth. He further goes into darkly comic detail about the reader's chances of perishing in such a strike in any given year. Alas, there is no similar table for alien abductions. Then again, I guess it would have only one entry, noting a "zero" chance.

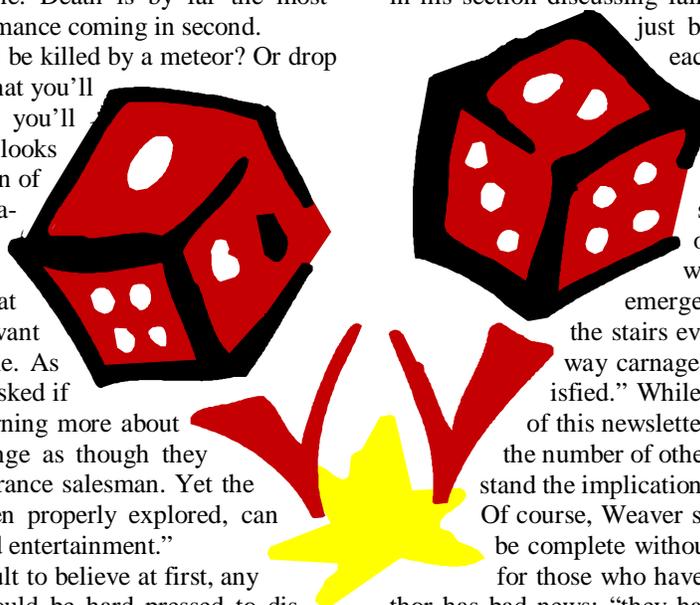
As he discusses one topic after another, Weaver corrects some common misperceptions about probability. For example, in his section discussing falling down the stairs, he notes that

just because an average of 300 people each year may be killed in such tumblers, "the fact that it is December 28 and the 300 people have already bitten the dust on the stairs does not mean that you can do a swan dive off the landing or strap on a pair of roller skates on the way to the cellar and expect to emerge unscathed. You can still die on the stairs even if the statistical quota for stairway carnage for the year has already been satisfied." While this may seem obvious to readers of this newsletter, I think we might be surprised by the number of others out there who truly don't understand the implications of such numbers.

Of course, Weaver says no book on this subject would be complete without a discussion of the lottery. Alas, for those who have dreams of striking it rich, the author has bad news: "they have a snowball's chance in hell of actually walking away with a few million dollars." But that doesn't stop him from explaining why this is so or how it is that no amount of "strategy" (other than cheating) will make it more likely that any given player will win.

Whether you loved learning math in school or broke out into a cold sweat with every pop quiz, Weaver's humorous look at events both ordinary and unlikely will keep you entertained. And you just might learn something in the process. While the book does not deal specifically with any of the fringe science or paranormal topics we generally address, it does present a great deal of information that can be applied to any number of circumstances, which makes it a good aid in all of our struggles against irrational thinking.

*[A shorter version of this article originally appeared in the State Journal-Register. It is printed here with permission of the author.]*



## Sherlock Holmes Stories Teach About Common Mistakes

by David Bloomberg

People lose time and money to errors in logic and probability every day; indeed, it's something we, as skeptics, try to point out when we can. Yet most people have no interest in sitting down to read a book about math or statistics – or, unfortunately, even looking at the REALL newsletter! Physicist and writer Colin Bruce set out to create a way to impart such information in an entertaining, yet still meaningful, way. He did so by using the venerable Sherlock Holmes and his faithful companion, Dr. Watson.

The result was his book of last year, *Conned Again Watson!: Cautionary Tales of Logic, Math, and Probability* (Perseus Publishing, \$24). Bruce has done an excellent job of recreating the Holmes and Watson personas and writing in a style similar to Sir Arthur Conan Doyle, Holmes' creator. Indeed, this is his second book using such stories – his first explained difficult concepts in modern physics.

Bruce focuses the short stories on different aspects of various "cons." Among these are intentional attempts to scam another person and also the times when people con themselves, both in business and in everyday life. He uses stories told by clients and by Watson to show a number of ways in which the same fallacies tend to show up again and again.

For example, in one story Watson talks about how he has gone to a certain part of town for sandwich bread and meat, and avoided the other side of town because the bakery there charges twice as much for a loaf of bread. Holmes points out that this is true, but that the butcher Watson visited charges more for the meat. While the percentages are such that the meat price seems only a little bit higher, that small amount is more than is saved on the bread. By looking at the percentages instead of the actual cost, Watson ended up paying a higher price. He refused to pay double the price for bread, but ended up paying more for the sandwich overall. This is the "penny-wise, pound-foolish error."

Another error described by Holmes – and one that is of more direct interest to this newsletter's readers – is the belief that "the laws of chance require outcomes to come back into balance." For example, if you flip a coin and get heads five times in a row, many people believe the next flip is more likely to be tails. In fact, it is not. Each flip is independent; the same is true of many situations.

In further discussions of chance events, Bruce addresses statements such as an event having a "one in ten thousand chance" of happening. People tend to forget that such things can, indeed, occur – just with a low frequency. A given person, for example, has only one chance in millions of winning the lottery; but people win every week – it doesn't even strike peo-

ple as strange.

Yet if a small cancer cluster is found and an expert says there was a one in a thousand chance of it happening, rarely does anybody run to an atlas to see how many towns of this size exist in the U.S. Could there be a thousand? If so, is it really so odd that something like this should happen? While Bruce doesn't discuss this type of situation specifically, his stories lead one to realize how often such claims are misused.

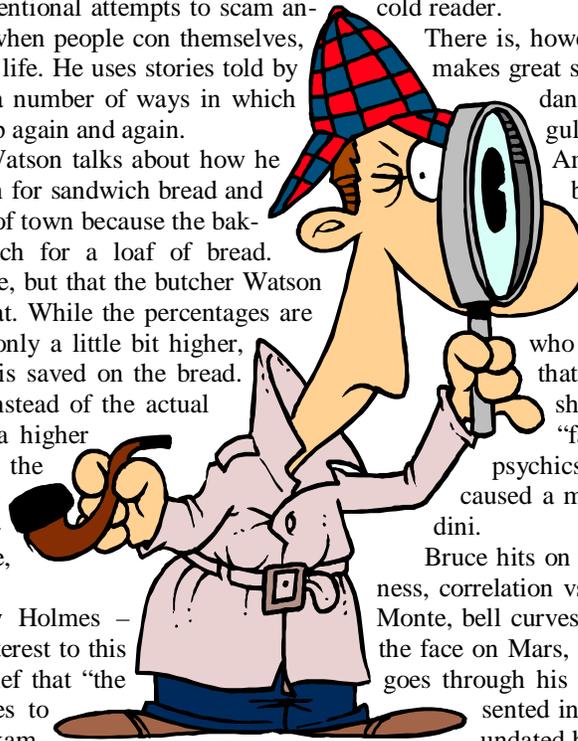
Another area rife with problems is addressed in Bruce's discussion of horoscopes and similar predictions. Holmes addresses the way people tend to remember the correct predictions and forget or ignore those that fail. If somebody's horoscope says he will face a challenge and have a great accomplishment and so will reap monetary reward, he might find that there is, indeed, an accomplishment in the near future. But he may easily forget about the reward if none actually occurs. He will later think back to his horoscope as a correct prediction. We see this all the time with psychics, astrologers, and every other sort of cold reader.

There is, however, one prediction offered by Holmes that makes great sense: If people are not careful they will face danger – "Danger of believing predictions too gullibly."

Amusingly, Bruce even takes what appears to be a shot at Sir Arthur Conan Doyle, who was a completely uncritical believer in many bizarre claims. In reading Bruce's discussion of a scientist who fell prey to fake spiritualists and forged photos, those who are familiar with Doyle's history may recall that he believed in obviously fake photos that showed some young girls playing with "fairies" and also believed in all manner of psychics and spirit mediums – to the point that it caused a major falling-out with his friend, Harry Houdini.

Bruce hits on gambling, the lottery, the nature of randomness, correlation vs. causation, the placebo effect, Three-Card-Monte, bell curves, the Bible Code, crop circles, faith healing, the face on Mars, and the necessity of double-blind tests as he goes through his many Holmes stories. All of these are presented in such a way that the reader does not feel inundated by information, as if he was in some statistics class. Even though some of the topics he discusses are not immediately intuitive, the reader can't help but learn something new about the way we often find ourselves conned again. Even better, perhaps those who don't routinely peruse skeptical books may find themselves adopting a more logical outlook on life.

[A shorter version of this article originally appeared in the State Journal-Register. It is printed here with permission of the author.] ♡



## REALLity Check

by David Bloomberg

Well, it's been quite a while since we've had a "REALLity Check" column – in fact, as far as I can tell, we haven't had one all year. But this month we're back with some news you can use, and we've got stories that span the globe.

### Death by Belief

We begin in New Zealand, where the *New Zealand Herald* (6/5/02) reports that a jury has found a couple guilty of killing their own son. Unfortunately, news of parents killing their own children is not as rare as it once was, and it wouldn't normally rate mention in this newsletter except for the manner and reasons for this death.

Deborah and Roby Moorhead were convicted because their son died of broncho-pneumonia due to a vitamin B-12 deficiency which the paper says "could easily have been treated." But instead of allowing an injection of the vitamin, the couple took their son from the hospital and went into hiding. The paper says instead of this treatment, "They administered a variety of herbal remedies including smearing garlic on the soles of his feet."

Why did they do something like this? The couple said they saw the issue as a test of their faith, and they would not compromise their beliefs by using conventional medicine. The newspaper reports that the court indicated, "Belief in the healing power of alternative remedies, or the healing power of God, or opposition to blood transfusions was not a lawful excuse for omitting to obtain medical treatment for a sick child."

It seems I often find myself referring back to James Randi's statement, quoted in our masthead. It is indeed a dangerous thing to believe in nonsense. In this case, it wasn't dangerous for those who believed, but for an innocent boy who never had a chance.

### Italy's Homeopathy Fight

Moving on to Italy, we find a fight over alternative medicine – specifically homeopathy. Readers may already know that homeopathy, while I would consider it all too popular here in the U.S., is even more beloved in Europe, where it has official

recognition in several countries.

In June, Italian newspapers reported on a document signed by two Nobel laureates and dozens of famous scientists that denounces homeopathy and says it doesn't work. In addition, studies by government health agencies have found it to be ineffective.

But did this cause all the pro-homeopathy people to say, "Oh, yes, you're right. Never mind."? Not quite. Instead, they have, of course, reacted against it. What's worse is that the Health Minister has apparently announced that he will ignore the results of the study, because "there are other studies that prove the opposite." Where is this great evidence? I suppose it's in pro-alternative medicine journals, which don't quite have the same standards of peer review as scientists and doctors should be used to.

However, it shows what science is up against when politics gets involved.

### Reinventing the Wheel

Here in the U.S., the Bush administration has decided to reinvent the wheel when it comes to ephedra. While the drug/herb/supplement/whatever you want to call it has been blamed for numerous deaths and even more cases of nasty side effects, that just isn't enough. The *Chicago Tribune* reported in June that not only won't it be banned – as consumer advocates would like – but it won't even be labeled, despite the fact that federal health officials have long wanted warnings.

Instead, a new group has been assigned to study it from the bottom up all over again. They will begin with a review of already-existing data, the results of which are due in the Fall. Then they will determine what additional information they need. Etc.

Mind you, if this had been a prescription drug, it would already be off the market due to its side effects. But since the FDA is not allowed to regulate "supplements" in the same way, they are helpless. And it doesn't look like Bush is exactly jumping in to help out the situation.

In other words, despite the number of deaths and side effects that have been documented, don't expect anything to happen under this administration. ☹

(*"The Physics of ESP"* continued from page 3)

straints that seem to prevent macroscopic objects from traveling back in time. People with precognition simply acquire information from the future, obviating the need for people to do the traveling. Might not this prevent all these problems? Unfortunately, changing the past is the same as sensing the future and altering the present. Consider, I have a vision of a future calamity. Using my precognitive information I prevent this calamity. How then can information travel to the past about an event that never happened? If I am not warned then I can't prevent the calamity and it occurs. We're back to the grandfather's paradox. Theoretical physicist Stephen Hawking, the Lucasian pro-

fessor of mathematics at Cambridge University, has my favorite, if unique, objection to time travel. He contends that if it were possible we would be inundated by hordes of tourists from the future.

What this all boils down to is the violation of one of the foundations of all modern science, cause and effect. All of physics is based on cause and effect and the existence of precognition would require the modification of many of its principles. Physicist Lawrence Krauss said it best, "That's a lot to ask for a little precognition."<sup>2</sup>

After examining the different forms of extra sensory per-

(*"The Physics of ESP"* continued on page 8)



## Our Next Meeting

### *Stay Home!*

We have nothing planned for the July meeting, so stay home and relax for a change!

*(“The Physics of ESP” continued from page 7)*

ception and many well established, widely accepted principles of science, it is obvious that both are incompatible. Either the reported claims of ESP are somehow in error or much of science is. In this regard, ESP is similar to many other paranormal phenomena and pseudosciences. When one looks for a physical process or mechanism, none are found that are consistent with our understanding of nature. Our minds, however, are powerful. Powerful enough to reveal many of the true wonders of the universe. ESP is just not one of them.

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