EdgeScience

Current Research and Insights

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Special New Energy Section:

A Demon, a Law, and the Quest for Virtually Free Energy

Cold Fusion: Is Vindication at Hand?

ALSO IN THIS ISSUE

Breakthrough: Clues to Healing with Intention

Extreme "Adventures" of Super Athletes

A publication of the Society for Scientific Exploration

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Why EdgeScience? Because, contrary to public perception, scientific knowledge is still full of unknowns. What remains to be discovered—what we don't know—very likely dwarfs what we do know. And what we think we know may not be entirely correct or fully understood. Anomalies, which researchers tend to sweep under the rug, should be actively pursued as clues to potential breakthroughs and new directions in science.

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The Society for Scientific Exploration (SSE) is a professional organization of scientists and scholars who study unusual and unexplained phenomena. The primary goal of the Society is to provide a professional forum for presentations, criticism, and debate concerning topics which are for various reasons ignored or studied inadequately within mainstream science. A secondary goal is to promote improved understanding of those factors that unnecessarily limit the scope of scientific inquiry, such as sociological constraints, restrictive world views, hidden theoretical assumptions, and the temptation to convert prevailing theory into prevailing dogma. Topics under investigation cover a wide spectrum. At one end are apparent anomalies in well established disciplines. At the other, we find paradoxical phenomena that belong to no established discipline and therefore may offer the greatest potential for scientific advance and the expansion of human knowledge. The SSE was founded in 1982 and has approximately 800 members in 45 countries worldwide. The Society also publishes the peer-reviewed *Journal of Scientific Exploration,* and holds annual meetings in the U.S. and biennial meetings in Europe. Associate and student memberships are available to the public.To join the Society, or for more information, visit the website at scientificexploration.org.

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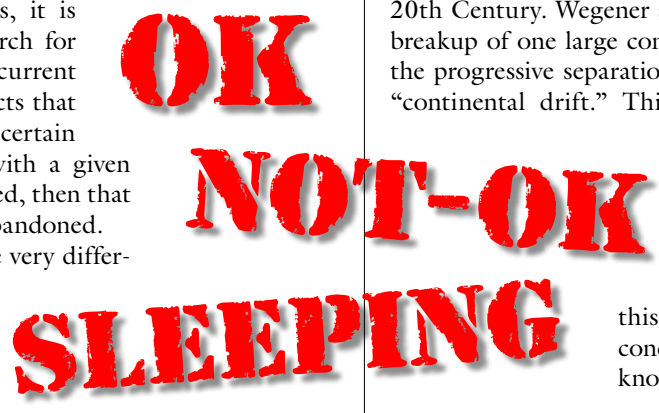
Peter Sturrock

Types of Anomalies

Anomalies should be the life-blood of science. Niels Bohr once said that "progress in science is impossible without a paradox," and Richard Feynman has remarked that "The thing that doesn't fit is the thing that is most interesting."

The crucial point to note about "anomaly" is that it is a relative concept, not an absolute concept. A result is an anomaly only with respect to a given theory or hypothesis. In scientific research, it would typically be an experimental or observational result that is not in accord with current theory. Therein lies its importance: An anomaly provides a test of a theory. As Feynman's remark implies, it is much more important to search for facts that do *not* agree with current theory than to find further facts that do agree with that theory. If a certain fact, which is incompatible with a given theory, can be firmly established, then that theory must be modified or abandoned.



Different anomalies evoke very different responses from the scientific community. To clarify matters, I suggest that we may distinguish three categories that we may refer to as "OK Anomalies," "Not-OK Anomalies," and "Sleeping Anomalies."

An "OK Anomaly" is one that has been discovered by an established scientist, preferably using expensive equipment, and which appears to be an anomaly that scientists can cope with. Examples of OK Anomalies include the discovery of quasars and pulsars. Claims for both of these astronomical discoveries were made by established astronomers using powerful (and expensive) optical or radio telescopes. Both anomalies were viewed as due more to limitations in our astronomical knowledge than to errors in our understanding of physics.

A "Not-OK Anomaly" is one that is not obviously resolvable and presents an unwelcome challenge to established scientists, possibly (but not necessarily) because it has been discovered by a non-scientist. A classical example of a Not-OK Anomaly is the case of meteorites. These objects fall from the sky and may be discovered by any citizen (with or without a college degree), and no specialized equipment is required. In 1772, French Academicians had ruled that these objects could not have fallen from the sky, since there are no stones in the sky to fall. The authenticity of meteorite falls was finally and incontrovertibly established by the distinguished scientist Jean-Batiste Biot, who was sent by the President of the National Institute to investigate a particularly large meteorite fall (over 3,000 stony meteorites) that occurred at L'Aigle, in Normandy, on April 25, 1803. A list of current Not-OK anomalies would contain many topics that are generally dismissed as bogus by the scientific community, such as UFOs and psi phenomena, as well as cold fusion and anomalous healing, two subjects touched upon in this issue.

A "Sleeping Anomaly" is one that has not yet been generally recognized as an anomaly. A historical example of a "Sleeping Anomaly" is the close geometrical match between the west coast of Africa and the east coast of South America. This fact had been noted by Francis Bacon and others, but it was not generally recognized as a challenge to understanding until Alfred Wegener drew new attention to it early in the 20th Century. Wegener attributed the correspondence to the breakup of one large continent (referred to as "Pangea") and the progressive separation of the parts by a process he called "continental drift." This proposal was ridiculed for many years, especially by geophysicists. The tide turned when geophysicists found that the magnetic signatures on the two sides of the Mid-Atlantic Ridge were effectively mirror-imaged, showing this ridge to be a "spreading center," a concept that plays a key role in what is known as "plate tectonics."

We now know that the scientific community was in error in its response to the challenge of meteorites and to that of continental configurations. Can we be sure that we, scientists of the 21st Century, are not making similar errors in our response to some current anomalies? A little doubt may be good medicine for one's intellectual health.

Peter Sturrock has spent most of his life as a conventional scientist, working on accelerator physics, electron physics, plasma physics, solar physics, astrophysics, and statistics at Stanford University. But he has in addition spent almost half his life studying topics that are decidedly unconventional. "It is rather like being a Republican by day and a Democrat by night," notes Sturrock, "which would I suspect give one keener insight into both parties. By working in both conventional and unconventional areas, I have—I believe—developed a deeper appreciation of the strengths and weaknesses of both kinds of science." His just published memoir *A Tale of Two Sciences: Memoirs of a Dissident Scientist* (www.exoscience.org) describes, among other things, the founding of the Society for Scientific Exploration.

Some Further Thoughts on Premonitions

I teach a class at Utah Valley University in a Technology Management Program entitled Reliability Engineering and Safety. One of the chapters in this course is Situational Awareness. The definition of this concept is short and sweet; *Knowing What is Going On Around You*. In this class we discuss how to have Situational Awareness and how to recognize when you have lost it. There are 11 clues that can be observed in one's operating vocations that tell you that you are losing your Situational Awareness.

This research work was done in part at the University of Texas in their Psychology Department under grants from NASA some years ago. The principle researcher at that time was Robert Helmrich. The concept has been widely adopted in the commercial aviation industry and has become part of instructional efforts in many other safety critical industries.

One of the results of their research was the observation that if 4 or 5 of these clues are observed in a given activity, there is a very high probability that a serious incident is imminent. The instruction is that the activity should be put in an idle or safe situation until the reason for the presence of the clues can be ascertained and resolved. Another observation of the research that became one of the clues was that if someone in the activity had a "Gut Feeling" that something was wrong, it should be carefully considered because the research showed that nearly 100% of the time, something bad happened.

The 11 clues are;

(1) Failure to meet Targets.

(2) Use of an Undocumented Procedure

(3) Departure from a Standard Operating Procedure.

(4) Violating Maximums or other Limitations.

(5) "No One Flying the Plane" or No One in Control

(6) No One Looking Out the Window or observing what is going on.

(7) Communications Breakdowns

(8) Presence of an Ambiguity or Anomalous data

(9) Unresolved Discrepancies

(10) Preoccupation or Distraction (fatigue or emotional situations

(11) *Confusion of Apprehensive Feeling or the Gut Feeling that something is wrong.*

Regarding clue 11, many dismiss various explanations as the subconscious observing a bad developing situation or seeing several of the clues by the subconscious. Personally, although some of these other explanations may be valid, I am wondering if precognition may be operable in these situations that are generally life threatening.

An incident several years ago occurred with a Flying Tigers Airlines 747 on approach to Kuala Lumpur in Indonesia in the middle of a very dark night. From the direction they were on approach, the Instrument Landing System was out of service and they would have had to go another hundred miles to come in from the other direction where it was in service. While several of the clues to losing Awareness were eventually present (7, 8, 9 and 10), the first officer tried to get the captain to do the fly around, saying on three occasions, "Captain, I really don't feel good about this, let's go around and use the instrument system." These protestations occurred before any of the other clues were observable. Because of the ultimate presence of several of the clues, unrecognized, they flew into a mountain. The other 4 clues were observable only just prior to the crash. From the data I observed in this incident, it appears the first officer's comments were begun at least 15–20 minutes prior to the other four clues being observable.

The info you supplied in your article ("Straight From the Gut," *EdgeScience* No.1) will be valuable in my class when we discuss Situational Awareness. I can't put my finger on it precisely, but I have a feeling the ideas on precognition may be interacting somehow in the other 10 clues. Something to continue to ponder. Great article.

—John MacLean

First Issue

Bravo—for a great job on the first issue of *EdgeScience*… I especially enjoyed Roger Nelson's summary of GCP/REG research, and the inclusion of a review of one of my favorite books, Robert Becker's *The Body Electric,* a review that not so incidentally also served as a tribute to the author, a true "EdgeScientist" if ever I've met one. *—EWK*

Congratulations for such a nice, informative, and attractive first issue of *EdgeScience.* A publication like this was needed. *—CSA*

I really enjoyed the first issue of *EdgeScience* magazine… *—JR*

Love your new magazine…—JM

Excellent first issue…—RW

Absolutely fascinating…—CJ

William F. Bengston

Breakthrough: Clues to Healing with Intention

A very long time ago, soon after I graduated with a B.A. in sociology from Niagara University, I met a man who claimed he had only recently discovered his own psychic abilities. At the time, in 1971, Bennett Mayrick was a house cleaner. He had held a variety of jobs before I met him, including floor installer, professional singer, etc. Basically, he was a jack-of-all trades. Since I don't naturally default to belief, I asked him if I could test his claim. He not only agreed but also actually welcomed the opportunity as he proclaimed himself a skeptic. And so a partnership was born.

I began in the usual way, by giving him objects that belonged to various people and had him describe their character, surroundings, and events in their lives. I admit to having been impressed by his readings, even as I wondered if there might be an element of self-delusion in all of it. And so I dragged him around to people who claimed to be experts in such matters. We went to the American Society for Psychical Research in Manhattan, to the dream lab at Maimonides Hospital in Brooklyn, and such. I found these experiences to be quite frustrating, as the experts didn't seem to have their methodological acts in order. And so I, a fledgling researcher in the early stages of graduate training, began to design double blind tests that were far more rigorous than anything the "experts" had prepared for us. In short, Bennett passed these tests with flying colors, and I wondered what to do next.

That problem didn't last long, as one day while we sat in a kitchen talking about this and that, I had a flair up of chronic lower back pain that had made me give up a swimming scholarship. Off the cuff, I asked him to put his hands on my back and take away the pain. He thought I was crazy but tried anyway. About ten minutes after he put his hands on me, the pain went away. And decades later, it still hasn't returned. If this was hysterical suppression of symptoms, I'll take it!

All of this was before the "new age" boom, when alternative-healing practices became widespread even if not accepted by the medical community. I watched Bennett put his hands on person after person and saw much that I myself would never believe had I not witnessed it. Some ailments responded poorly or not at all. Warts, for instance. There was no effect at all on warts, and to this day I consider that to be a clue even as I continue to be flummoxed by what it means. On the other hand, cancer responded almost immediately, and the more aggressive the cancer the faster it seemed to respond. The only failures with cancer were with those who had had radiation or chemotherapy. I suspect this is another clue, which might mean that healing does not mix well with therapies that kill.

After watching many dozens of healings, I began to get frustrated. Sure, the cures were amazing, but the complexities involved in clinical cases made them too fuzzy for my sensibilities. Did a cure result from the hands-on treatment, the extra vitamin C that the patient took, their personality type, or something else? I needed to know.

And so with a friend named David Krinsley, we decided to take the healing phenomenon into the lab. At the time David was chair of the geology department at Queens College of the City University of New York, and I was a fledgling instructor at St. Joseph's College in New York, doing graduate work in sociology, specializing in criminology, the sociology of religion, and statistical modeling. David was in a position to call in some favors so he solicited the head of the biology department to devise a test that would be airtight. One of the chair's department members had been doing mice studies on a particular form of mammary adenocarcinoma that is 100 percent fatal within 27 days of injection. The model itself was so well understood that statistical studies of lifespan were routinely done, even as no mouse had ever lived past 27 days. If we could even get our mice to live closer to the 27 day mark, that would be strong evidence of a healing effect. If a mouse were to live to day 28, well, then we'd own the world record.

Our original intent was to have Bennett do the treatments, but circumstance had him back out at the last minute. We were then left with cancer-infected mice and no healer. Rather than cancel the experiment, David convinced me to act as substitute healer. By that time I had spent a great deal of time watching, testing, and also assisting Bennett in some healing cases. And so, seeing no alternative, I reluctantly (and without much confidence) agreed.

A Skeptic as Healer

I used healing techniques that Bennett and I developed through introspection, trial and error, and simple intuition. The techniques are completely belief-free and involve a process of extremely fast visualization of a series of personal images done in conjunction with the laying-on of hands, in which the person tries, with as little effort as possible, to feel an energy flowing out from the palms of his or her hands. The images each person uses are generated by a personal list, prepared prior to the experiment, of 20 outcomes wanted in his or her life, specific goals that involve their own health, ideal jobs, material aspirations, or other people. Each item on the list is translated into an image that represents the achievement of that particular goal. These personal images are then memorized and the prospective healer practices cycling through them in a kind of mental filmstrip loop. This technique, rather than slowing down brain activity through some sort of meditative

technique, actually speeds up brain functioning and activity through the rapid visualization. At the same time the hands-on technique is done in a very detached manner on the assumption that focus or belief would only get in the way. We can carry on normal conversations and even read while doing the hands-on techniques.

For an hour a day I placed my hands around the cage of six mice, wondering how in the world I had come to this. Here I was, a skeptical researcher suddenly saddled with the task of treating a cancer that is always fatal.

Since neither David nor I had any precedent in what we were doing, we naively suspected that if the treatment was to have any success then either the mice wouldn't develop tumors or the tumors would be slow to grow. To our initial consternation, neither scenario occurred. Within a few days, palpable tumors developed on the mice, and I was discouraged to say the least. My initial reaction was to cancel the experiment, put the mice out of their suffering, and call it a day. David urged otherwise, especially since he had gone to a great deal of trouble to set up the experiment. And so I continued the daily treatments even as the tumors grew larger.

Any remaining hope I had disappeared as the tumors developed blackened areas on them. I saw this as the beginning of the end. Then, the blackened areas ulcerated and the tumors split open. Again I urged that we do the ethical thing and end the experiment. But the biology chair noticed that the mice still had smooth coats and their eyes remained clear, and he wondered why they were acting as though perfectly healthy.

Then, in the final stages, the mice tumors simply imploded without any discharge or infection of any sort; it was a full lifespan cure. We were stunned. Here was a skeptical healer and a presumably non-believing group of mice that had gone through a novel pattern of remission to full cure in a mouse model without precedent of a cure.

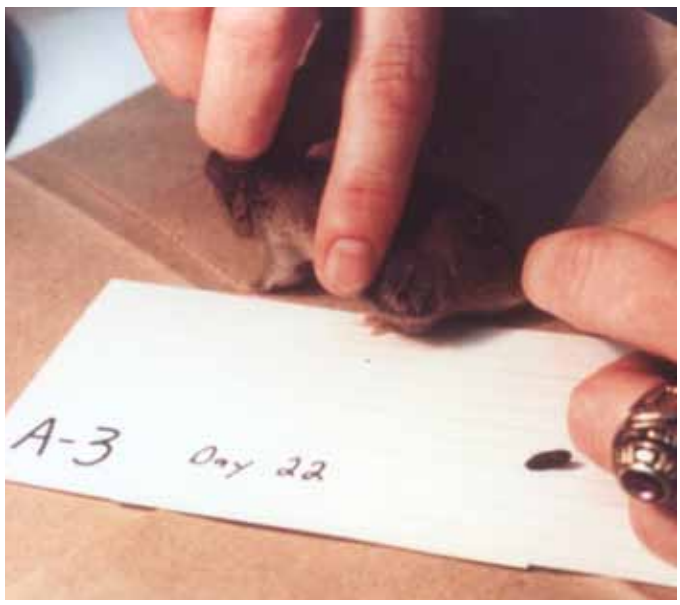
Let's Try That Again

What to do next? Obviously replication. Even then it occurred to me that if this healing phenomenon were to have any practical use, it needed to be independent of any individual. Plus, I was pretty burned out from the emotional rollercoaster of the experiment. And so I insisted that David, the biology chair, and two non-believing student volunteers submit to being trained in the healing techniques. The only requirement for inclusion in the experiment was that the volunteer healers not believe that healing was possible. I actually went through several students in my screening process to find the strongest levels of skepticism. Clearly I am not into faith healing.

In fact, I'm quite sure that positive attitude isn't necessary to do healing. Certainly belief isn't either. Speculatively, I think there is a possibility that belief can hinder healing effects, as believers have a tendency to insert themselves into the process because they have a stake in the outcome (the same reason healers can't generally heal themselves). Healing is effective to the extent that the ego is removed. I also think that ritual (all ritual, really) destroys the thing that it is trying to reproduce. In healing, ritual blocks the "flow" of healing. People get very mad at me when I say this. And so in speculative hindsight, I unintentionally may have loaded the deck in my experiments by working only with non-believing clean slates.

The four skeptical "volunteers" then replicated what I did, and we got essentially the same results. All of the mice were cured. I then moved the operation to St. Joseph's College where I was working, and with the chair of the biology department there did experiments three and four with other skeptical volunteers. In those experiments we also tried injecting the mice with twice the dosage necessary to produce a fatal cancer, tried multiple injections, and even tried re-injecting them after the experiment was over. But the mice remained immune to future injections throughout their two-year lifespan.

Day 14: A mouse 14 days after being injected with mammary adenocarcinoma.



Day 22: A blackened area begins to develop on the tumor.

We have now done ten experiments on mice at five different institutions, including two medical schools. Eight of those experiments involved the same mammary adenocarcinoma, and two of them used methylcholanthrene-induced sarcomas, which are not quite as aggressive. Though these experiments achieved healing across the board, the intricacies of the results are complex and, frankly, quite puzzling.

Control Group Cures

Among the more interesting complications is that under certain conditions, our untreated control group mice also remitted. If the control mice were housed in a different building than the experimental mice, they always died on schedule. But if anyone who knew the healing techniques came into a room where the control mice were housed, the infected mice who were still living went through the process of remission of blackened area to ulceration to tumor implosion to full lifespan cure. At first this was extremely annoying, as conventional scientific analysis takes success to mean that there was a greater effect in treated verses untreated groups. But if the untreated control mice also got cured, then there were no differences for us to report! At first we simply relied on the fact that the mice we were working with always died when injected with cancers, and so we already knew what should have happened with our mice. All of them should have died. But since mice from both groups were getting cured, we knew we had another clue. It was just a very difficult clue to interpret.

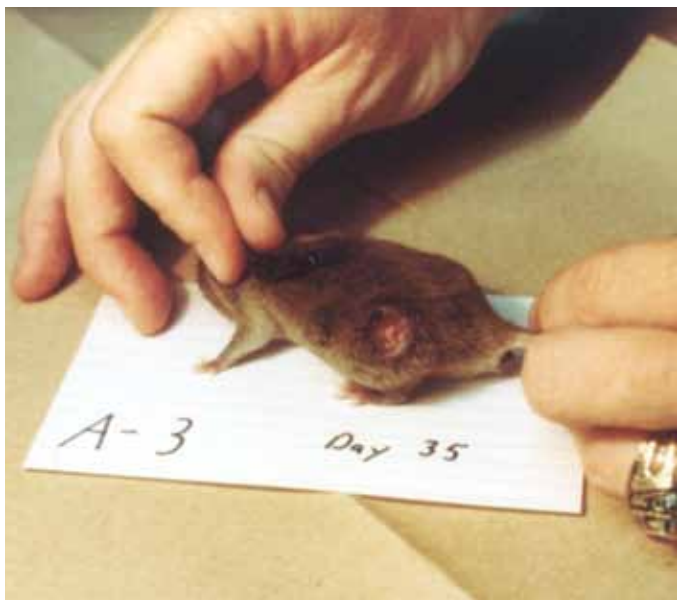
I worked on this problem for a long time until I realized that perhaps one of the basic assumptions of experimental methods might just be incomplete: that separate groups are independent. If that assumption of independence between groups can be violated, then perhaps I could account for the remitting control mice. Perhaps all the mice were somehow resonantly bonded with each other. Our colleagues in physics are certainly used to entanglement, or what Einstein famously called "spooky action at a distance," but only on a microscopic level. As far as I know, entanglement has only been shown to about 100 or so atoms, certainly fewer than the number of atoms in a mouse. Yet we were getting similar effects in complete biological organisms. I wonder how many other labs might have experienced resonant bonding between their experimental and control groups, and mistakenly concluded that their experiments were not successful and dismissed their findings? (This is called a "type II" error – thinking that nothing significant happened when in fact it did.)

Placebo Effects

A few years back I was giving a talk on this possibility at the 2003 Paris meeting of the Society for Scientific Exploration when a group from a lab in Freiburg, Germany, jumped up excitedly and said that I may have solved the placebo problem. I expressed gratitude to them for saying that, but I also said that I didn't know what the problem was. Like many people, I assumed that the placebo phenomenon was simply the power of suggestion, and that doctors, for example, might prescribe an inert pill that could produce real effects in a patient because of that suggestion.

But after the conference, I began to look into placebos a bit more, and what I found astonished me. The idea that a placebo could produce real physiological effects was unthinkable in medicine 50 years ago, but by now medicine recognizes that placebos do work, even as the mechanism by which they work and the circumstances under which they work remain a mystery. Yet, in fact, it turns out that placebo effects increase over time to the point where up to 80 percent of the effects of drugs can be mirrored in placebos. The strength of this

Day 28: Tumor ulceration begins.



Day 35: Tumor ulceration.

effect has made it difficult for drug companies to prove that their new drugs work, as the gold standard of double-blind, placebo-controlled trials often end up mimicking the effects of the real drug in the control groups that only get placebo.

I began to speculate that perhaps this was happening to my mice. While they were not technically getting a placebo, the fact that the untreated mice kept getting cured was obviously suggestive. Perhaps the same process was at work. Perhaps experimental and control groups aren't as independent as we once thought, and just as people taking an inert pill respond as if getting an active substance, my control group mice were responding as if getting an actual healing. Could it all be connected? If so, we have to do some serious re-thinking of the assumptions of classical experimental design. Perhaps a treatment given to one group is also a treatment given to all groups? I've designed a sequential series of experiments to tease out what percentage of the placebo effect is due to suggestion and what percentage is due to resonant bonding, but I've yet to get funding or a lab to carry out the work.

The placebo/resonant bonding problem has also given me pause about whether healing can indeed be taught. I once thought that since I taught non-believers my healing techniques and they then went on to cure mice that otherwise would have surely died that I had demonstrated that my techniques were learned and effective. Now I'm not so sure. Think about it: if we have an experiment where five volunteers are trying to remit their cage of mice, even if only one person is able to do it then perhaps all the mice will be cured anyway and each volunteer will assume that he or she is the one who produced the cure. This is a daunting problem. In one experiment I was treating numerous cages of mice for different lengths of time trying to figure out what is the minimum dose necessary to produce a healing, and in one of the cages I never saw the mice but only held water that was fed to them. At the end of the experiment all of the mice were cured. Should I conclude that treated water can cure cancerous mice, or was it perhaps due to resonant bonding of all of the mice so that a treatment given to one is a treatment given to all? I'm still not sure of the answer.

Where Should We Go From Here?

All of this work is in the early and preliminary stages, but at this point there are some conclusions that can be made with relative certainty, and some conclusions that are a bit more tricky. The largest category, of course, is the enormous list of things we don't know. There is certainly plenty of research that needs to be done.

The most unambiguous conclusion is that cancer can be cured in experimental animals. Even a doubter such as myself has to throw in the skeptical towel after ten experiments. At this point we have only tested two types of cancers, and it remains to be seen whether different cancers respond differently to healing techniques.

All of the cured mice lived their normal lifespan of two years. After the initial cure, subsequent re-injections simply had no effect on the mice. This strongly suggests that an immune response is somehow being stimulated in the animals. If that is the case, perhaps the stimulated immune response can somehow be transferred to an animal that has not received the healing treatments. In fact, after one experiment was over and I was no longer involved in the day-to-day business of the animal labs, some cells were taken without my knowledge from remitting mice and transplanted to fully infected mice just to see what would happen; the transplanted cells seem to have in turn cured the fully infected mice. This suggests we might have the potential for either a literal or metaphorical vaccine that could reproduce the healing without the healer. Is there an immunologist who would be willing to take on this work?

What are the correlates of healing, in the healer, the healee, and the surrounding environment? We have undertaken other experiments to find answers to such questions.

Margaret Moga and I have done three mice experiments on mammary cancer at her lab at Indiana University Medical School, and while going through the usual routine of hands-on healing, also strategically placed geomagnetic probes to test whether there might be some interesting environmental correlates to the healing. And so we examined DC magnetic field activity during hands-on healing and distant healing of mice with experimentally induced tumors. And, in fact, during the healing sessions we observed distinct magnetic field oscillations adjacent to the mice cages beginning as 20-30 Hz oscillations, slowing to 8-9 Hz, and then to less than 1 Hz, at which point the oscillations reversed and increased in frequency, with an overall symmetrical appearance resembling a "chirp" wave. The waves ranged from 1-8 milligauss peak-to-peak in strength and 60-120 seconds in duration. We speculate that this evidence may suggest that bioenergy healing may be detectable with DC gauss meters.

About three years ago, independent researcher Luke Hendricks contacted me about my research with the mice. Luke is interested in both brain research and the practical applications of healing. After a few conversations about research possibilities, he in turn approached Jay Gunkelman of Q-Pro Worldwide, a leading authority on EEGs, about carrying out some experiments on brain correlates of my healing techniques. And so we all met at one of Jay's labs in Phoenix to look at interpersonal coupling or connectivity between healer and healee pairs using advanced signal processing approaches and instantaneous EEG phase coupling. Our results showed harmonic frequency coupling across the spectra, followed by EEG entrainment effects between individuals, and then by instantaneous EEG phase locking. These results suggest the presence of a connection between the healer and healee through a pattern of harmonics consistent with Schumann Resonances. If these data hold in subsequent tests, we may have isolated at least one connectivity mechanisms underlying healing.

But the questions go on and on. What happens when healing occurs? Do different healing techniques produce different results? Can healing be "stored"? Are placebo effects instances of resonant bonding? At this point, frankly, we're not sure yet of the proper questions to ask.

And mainstream science and medicine has not exactly been supportive. My history of research has generally followed

a two-step process. Each new lab expresses disbelief at my data obtained at other labs, and the researchers there take on a "oh yeah, well you couldn't get those results here" approach. When the mice get cured in the first experiment at any lab, it is usually taken as a gauntlet by lab personnel that they can thwart future positive results. Then, when the second experiment also produces full lifespan cures, it is often followed by head shaking and proclamations to the effect that this is the most amazing thing they have ever seen. But when I suggest further research, there is always some reason that the work cannot continue at that institution. When I suggest that it is my goal to reproduce the remissions without the healing techniques by using either the blood of cured animals or some correlate to the healing, my suggestion is usually met with intense skepticism that such a thing might be possible. I will, nonetheless, persevere.

Healing Humans

The eight hundred pound gorilla in the middle of the room is the question of whether any of this works on people. It is unambiguously the case that increasing numbers of people around the country are seeking out alternative and complementary medicine, which at this point in time must be classified as a growth industry. There are any number of schools of healing, workshops on healing, and practitioners of the various alternative-healing arts. But do they work? Surely the practitioners will swear by whatever it is that they do. But my non-systematic experience is that very few practices are rooted in rigorous data. That is not to say that they don't work; it is only to say that there are too many anecdotes out there not matched with empirical testing.

As I noted at the beginning, my experimental work grew out of clinical observations and my frustrations at not being able to isolate what works and why through clinical observation. Certainly people have been taught my techniques and applied them to people with some interesting anecdotal results. But to a researcher anecdotes are simply not enough.

At what point will there be enough evidence to do a controlled study on people? I don't think the question has a clear answer. While my passion is in the lab, I would certainly be open to some clinical trials. But in my experience watching human cancers being treated decades ago, my anecdotal clinical observation was that the most successful remissions were all associated with a lack of conventional treatments whose purpose was to kill cancer cells. When people speak of "complementary medicine," perhaps the methods I am aware of are not really complementary to the current crop of conventional treatments. If that turns out to be so, then the difficulties of carrying out successful clinical trials are greatly compounded. I don't yet know how to solve this problem. I do know that it is a problem worth pursuing.

For Further Reading:

Luke Hendricks, William F. Bengston, Jay Gunkelman, "The Healing Connection: EEG Harmonics, Entrainment, and Schumann's Resonances," *Journal of Scientific Exploration,* submitted.

Margaret M. Moga, William F. Bengston, "Anomalous DC Magnetic Field Activity during a Bioenergy Healing Experiment," *Journal of Scientific Exploration,* submitted.

William F. Bengston, Donald G. Murphy, "Can Healing Be Taught?" *Explore, vol 4(3),* pp. 197–200, May/June 2008.

William F. Bengston, Margaret M. Moga, "Resonance, Placebo Effects, and Type II Errors: Some Implications from Healing research for Experimental Methods," *Journal of Alternative and Complementary Medicine, vol. 13(3),* pp. 317–327, May 2007.

William F. Bengston, "A Method Used to Train Skeptical Volunteers to Heal in an Experimental Setting," *Journal of Alternative and Complementary Medicine, vol 13(3),* May 2007.

William F. Bengston, "Methodological Difficulties Involving Control Groups in Healing Research," *The Journal of Alternative and Complementary Medicine, vol. 10(2),* April 2004.

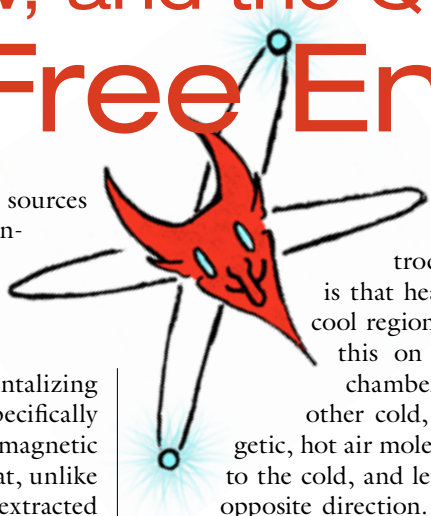
William F. Bengston, "Some Implications of the Bengston/Krinsley Healing Experiments," *Monterey Institute for the Study of Alternative Healing Arts, vol. 30-31,* December 2000, pp. 12–15.

William F. Bengston, David Krinsley, "The Effect of the Laying-On of Hands on Transplanted Breast Cancer in Mice," *Journal of Scientific Exploration, vol. 14(3),* Fall 2000, pp. 353–364.

William F. Bengston is a professor of sociology at St. Joseph's College in New York. He received his Ph.D. from Fordham University in 1980. Bill has been a member of the Society for Scientific Exploration since 1999 and currently serves on its executive council. He has written a memoir (with Sylvia Fraser) about his healing research entitled *Chasing the Cure,* which will be published in Canada by Key Porter in March 2010, and in the U.S. by Sounds True publishers in September 2010 under the title *The Energy Cure.* He can be reached at wbengston@sjcny.edu.

Garret Moddel **Illustrations by Benjamin Kessler**

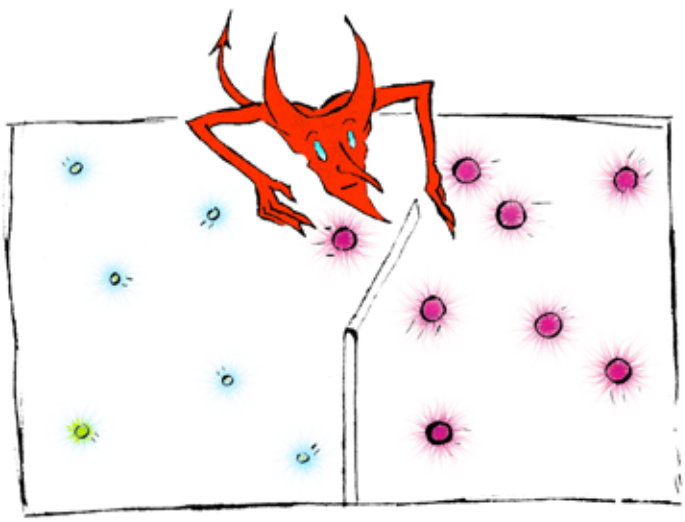
A Demon, a Law, and the Quest for Virtually Free Energy



If you believe what you read on the internet, new sources of energy now exist that can provide limitless, non-polluting, virtually free power. Supposedly these new sources have been patented and proven by scientists, but they aren't generally available because power companies or government agencies are suppressing information about them. The most tantalizing of these purported energy sources is the vacuum, specifically zero-point energy in the form of ubiquitous electromagnetic waves. The great thing about zero point energy is that, unlike many other sources of energy, it doesn't have to be extracted from the ground because it's literally everywhere around us.

What is zero-point energy? ZPE, for short, can be viewed as a consequence of the uncertainty principle in quantum mechanics. According to this principle, we cannot know both the position and speed (or more precisely, the momentum) of a particle to absolute precision. If a particle were at rest, we would know both. Therefore no particle is ever completely at rest, even at absolute zero temperature. Hence zero-point energy. Not only does ZPE make all matter vibrate, but even empty space can't escape its effects. All space is filled with this quantum vacuum energy, resulting in a huge quantity of electromagnetic waves that tantalize us, saying "Take me . . . if you can."

The question is: Can we? Can we extract this energy from the vacuum?



The Demon is in the Details

Let's step back from the hype and take a look at the fundamental underpinnings of vacuum energy extraction to see whether it makes sense. To do so, we must first understand the second law of thermodynamics. One of the ways to state this law, as introduced by Rudolf Clausius in 1865, is that heat can't flow spontaneously from a cool region to a warm region. To understand this on a microscopic level, picture two chambers filled with gas, one hot and the other cold, connected by a small hole. Energetic, hot air molecules diffuse from the hot chamber to the cold, and lethargic, cold molecules flow in the opposite direction. The effect is that heat flows from a hot region to a cold one, and not the other way around. Is there a way to reverse this process?

Let's imagine, as Scottish physicist James Clerk Maxwell did in 1867, that there's a little fellow who can. His name is Maxwell's demon and his sole mission in life is to violate the second law of thermodynamics. The demon guards a door blocking the hole between the chambers. Every time he sees an energetic molecule coming towards the hole from the hot chamber he closes the door. He does the same thing when he sees a lethargic air molecule approaching from the cold side. His devious nature emerges when he sees the occasional energetic molecule approaching from the cold side or the occasional lethargic molecule coming from the hot side. Out of spite for Clausius he lets them through. In this way the hot region becomes hotter by taking energy from the cold region, which becomes colder. The demon is the embodiment of a one-way valve for heat flow.

Can a real process exist that is represented by this demon's actions? After more than a century of creative proposals for Maxwell's demons, none has been found to exist. There really is no way to make heat flow spontaneously from a cold region to a hot one, or to provide useful energy by forming hot spots of gathered heat from a uniform temperature background. You can't get around the second law, so this little demon just can't exist.

But even proposals that claim not to be based on Maxwell's demon to extract energy from the vacuum actually do depend on the little devil—and therefore fail.

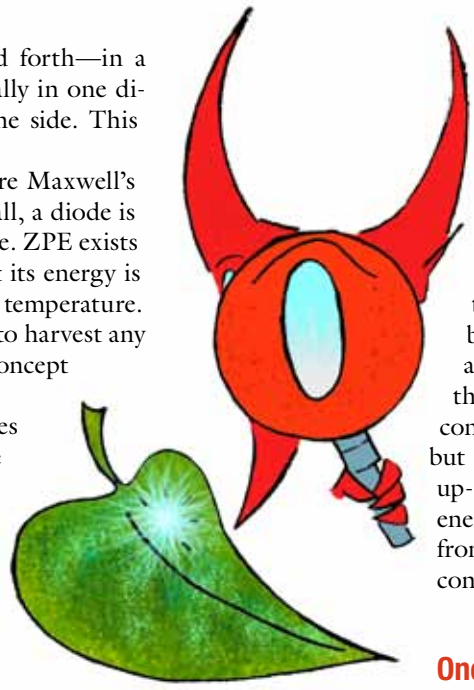
No Way for One-Way Valves

In a talk presented at the 2009 "Workshop on Future Energy Sources" with proceedings published by the American Institute of Physics, an investigator proposed using a diode, a one-way valve for electrical current, to harvest ZPE because these electromagnetic waves not only fill all of space, they also produce electrical oscillations in electronic components. The idea is that the uniform background ZPE would cause

oscillations—electrical charge moving back and forth—in a diode. And since a diode allows flow preferentially in one direction, electrical charge would build up on one side. This build-up could then be used to charge a battery.

Can this really be done? Or does this require Maxwell's demon and is therefore really impossible? After all, a diode is just a one-way valve, the demon's area of expertise. ZPE exists in a state of true equilibrium, which means that its energy is as evenly distributed as if it were at a uniform temperature. But Clausius already told us that there is no way to harvest any energy from a uniform distribution. So this concept cannot work.

How can we be so sure that one-way valves cannot harvest energy from equilibrium? Maybe Clausius got it wrong and someone will come along someday to correct his version of the second law, just as Einstein came along and corrected Newton's law of gravitation. Unfortunately, these are two very different types of situations. Newton's law was based on observation and abstraction. If Newton had been observing the effects of gravitational forces with sufficient precision and at cosmic scales, he might have come up with Einstein's more accurate picture instead. The second law of thermodynamics is different. Although it may have originated from observations, it has been re-developed using statistical mechanics, an application of probability and pure logic, and it is now supported by a foundation stronger and more accurate than any observation. Einstein wrote that classical thermodynamics "is the only physical theory of universal content which I am convinced will never be overthrown…"



What Goes Down Must Come Up

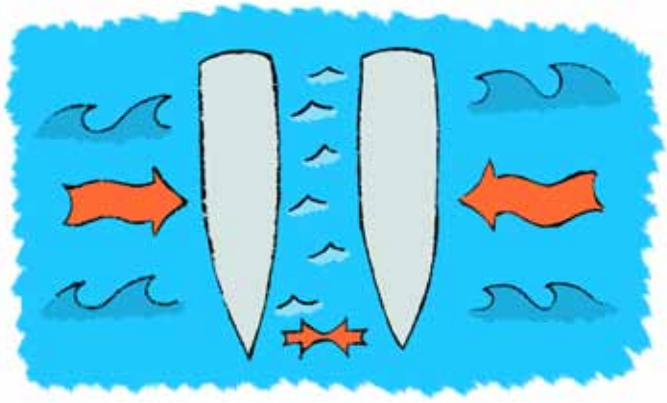
One of the problems with extracting zero-point energy from the vacuum is that the vast majority of this energy is in the form of extremely high-frequency electromagnetic waves. There is not much energy at radio and television-wave frequencies (around 100 million cycles per second) or even at microwave frequencies (around 10 billion cycles per second). Only when you get up to the frequencies of visible light (around 1 million billion cycles per second) is there enough energy to be useful as a power source. The problem is that today's electronics can't work at those high frequencies. For that reason, two U.S. Air Force researchers proposed a system intended to down-convert the high-frequency ZPE waves to lower frequencies, where they could be harvested for use in electronics. The researchers received a patent for this in 1996 (U.S. # 5,590,031).

Frequency down-conversion, like the use of diodes to convert electrical oscillations into direct current, makes use of what is called a nonlinear substance or device. Many minerals and all living material are nonlinear to some extent. If a nonlinear substance were sufficient to down-convert electromagnetic waves of ZPE then we would see hot spots wherever there was such a material. This is because the low-frequency oscillations that resulted from the down-converting of these fields would end up as heat. Maxwell's demon would have a heyday producing these hot spots from the background energy. But we don't see such hot spots, once again because the energy in the vacuum is uniformly distributed; it's in equilibrium. Based on this, Einstein developed a detailed balance description of emission and absorption in 1916. According to this balance, there is in fact down-conversion of vacuum energy into heat, but there is an exactly equal amount of up-conversion of the heat into vacuum energy. So there is no net flow of energy from the vacuum. The proposed down-conversion can't work, unfortunately.

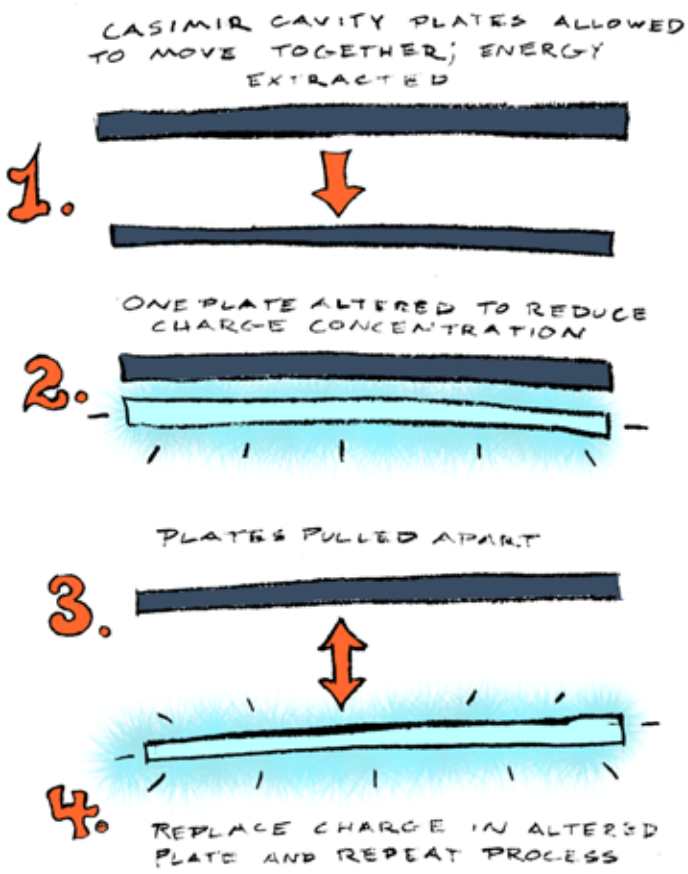
One-Trick Casimir Cavities

Another attractive approach to harvesting vacuum energy involves Casimir cavities. In 1947, the Dutch physicist Hendrik Casimir was developing a theory that predicted the existence of previously unknown forces between two closely spaced objects. He described his findings to Niels Bohr, the grandfather of quantum mechanics, as they took a walk together. In response to Casimir's description, Bohr mumbled something about zero-point energy. Casimir had the answer he needed.

The two plates on either side of a Casimir cavity are like two ships at sea. Waves pushing against the starboard sides of each ship are balanced by waves pushing against the port sides. But when the two ships move too closely alongside each other, they block the waves between them. Waves on the open-sea sides of the ships are no longer balanced by waves on the other sides, with the result that the ships are pushed together. Similarly, ZPE electromagnetic waves push against the Casimir plates. When the plates are spaced closely enough they block some of the long wavelength waves from forming between them, with the result that the plates are pushed together. This effect becomes noticeable only for spacings that are less than one millionth of a meter.



In 1999 and the early 2000s, a physicist published a paper in *Physical Review B,* received several patents (including U.S. # 6,665,167), and started a company, all dealing with the extraction of energy from the vacuum using the attractive force between the plates of Casimir cavities. According to the invention, he allows the plates to come together and extracts energy in the process. But if he then simply pulls the plates apart to repeat the process, the pulling apart would use all the energy gained in allowing the plates to come together and there would be no net energy gain. So, instead, he turns off one of the plates after they come together, then pulls them apart, turns on the plate, and repeats the process.



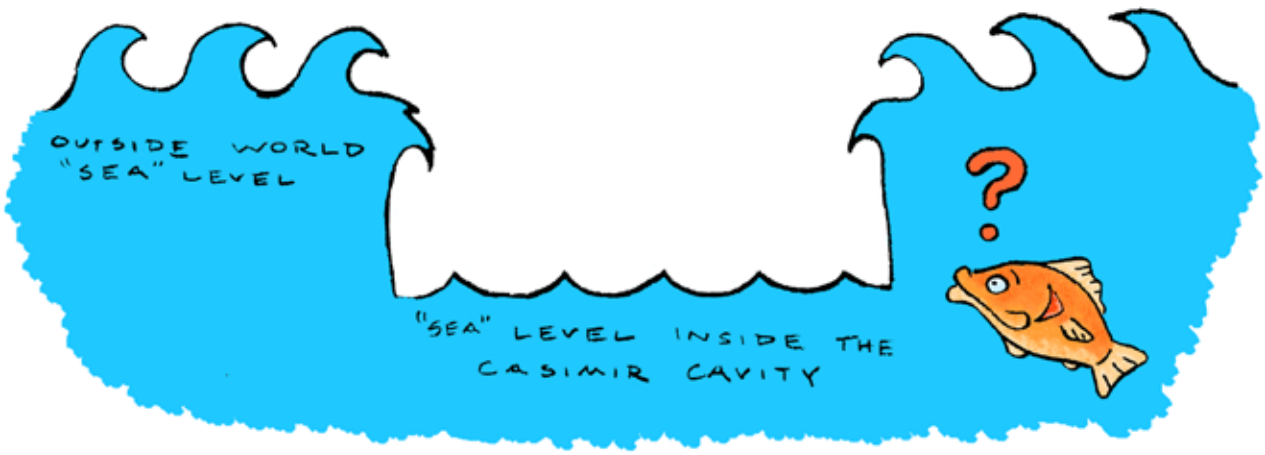
This process is like allowing a bucket of water to drop to the ground while it pulls a rope attached to a generator. You extract energy from the bucket on its way down. But to raise it up again would require as much energy as you obtained by letting it drop, and so you pour out the water to make it lighter. You then raise the empty bucket, fill it with water, and repeat the process. The problem, of course, is that any energy that you extract from the dropping bucket is lost in lifting up the water to fill the raised bucket. The process provides net energy only once, during the initial drop. This is because gravity is a conservative force.

The Casimir force resulting from zero-point energy is also conservative. Pulling the plates apart uses the energy that was obtained by letting them come together. Without expending energy there is no way to turn off the ZPE to allow the plates to separate without having to pull them apart. Casimir cavity attraction works once, but can't be used to obtain cyclic power.

Have we been left on the Casimir sea without a paddle? Is there any hope left for extracting energy from the vacuum?

Go with the Flow

There is one strange quirk of vacuum energy that opens up a possibility. In a thermal system at rest, the temperature is uniform. There are no differences in temperature that would allow energy extraction. But vacuum energy is different: it depends upon *local* structures and boundaries. Both in open space and inside a Casimir cavity, the state of lowest available energy is the zero-point energy state. As described earlier, however, the cavity rejects some of the ZPE, and so there is a difference between the energy levels inside and outside the plates. It's as if sea level were constant, *except in some locations.* On a real sea, the water would spill from the higher level to the lower, but for a Casimir cavity the local difference in "sea" levels is stable.



There may be a way to take advantage of this natural step in the lowest available energy. Gas flowing into the cavity from outside experiences this drop in ZPE. The gas atoms may drop into a lower-energy state inside the cavity. On the way in, they could emit the difference in energy in the form of electromagnetic waves, according to a patent that was issued in 2008 (U.S. # 7,379,286). After flowing through the Casimir cavity and exiting on the other side, the atoms would be re-energized to their initial state by the ambient ZPE field. The gas could be pumped through the Casimir cavity many times, so that the emitted energy would provide a continuous power source.

This is not like the contracting Casimir cavity described previously, which required the energy gained to separate the plates again. The function of pumping the gas is only to move it through the system, and is not directly related to the energy obtained from the vacuum. The pumping energy required is much less than what could be extracted from the gas emission. The overall function of the system would be to transfer ZPE from the environment and deposit it locally, where it could be used. This approach of using gas flowing through Casimir cavities circumvents the violations of thermodynamics that blocked the earlier approaches.

Can this work, or is there a hidden Maxwell's demon somewhere, meaning that a fundamental law has been violated? Standard quantum electrodynamics is consistent with the step in ZPE at the entrance to Casimir cavities, but no one has used it to predict a big change in the atomic energies of atoms flowing past the step. An alternative theory, called stochastic electrodynamics, does predict such a change. Does the concept work? My laboratory is now carrying out experiments to test the idea.

Whether this technique or others that have been proposed will work is an open question. What is not in question is the absence of Maxwell's demon. A successful zero-point energy extraction technique cannot rely on the little fellow to circumvent the second law of thermodynamics. Sleep, little demon, sleep.

Garret Moddel is a professor at the University of Colorado at Boulder investigating new energy technologies and psi phenomena. He currently serves as president of the Society for Scientific Exploration, and is co-founder of Jovion Corp., which patented the gas flow ZPE technology.

Cold Fusion: Is Vindication at Hand?

A Stamp of Approval

The title of an unclassified, eight-page, Defense Analysis Report produced by the U.S. Defense Intelligence Agency (DIA) and released on November 13, 2009 says it all: Worldwide Research on "Cold Fusion" Increasing and Gaining Acceptance. Only the report didn't call it "cold fusion" but "Low-Energy Nuclear Reactions," one of the terms under which this work has continued since Martin Fleischmann and Stanley Pons announced to the world in 1989 that their eletrochemical experiments had produced excess energy, which they thought could be nuclear in origin, at room temperature. But when most researchers attempting to replicate their results failed, the physics community dismissed their work, which the press labeled "cold fusion," as lacking credibility.


UNCLASSIFIED

Defense Intelligence Agency

Defense Analysis Report

DIA-08-0911-002 13 November 2009

Technology Forecast: Worldwide Research on Low-Energy Nuclear Reactions Increasing and Gaining Acceptance

UNCLASSIFIED

Since then, according to this DIA Technology Forecast, "Scientists worldwide have been quietly investigating low-energy nuclear reactions (LENR) for the past 20 years. Researchers in this controversial field are now claiming paradigm-shifting results, including generation of large amounts of excess heat, nuclear activity and transmutation of elements. Although no current theory exists to explain all the reported phenomena, some scientists now believe quantum-level nuclear reactions may be occurring. DIA assesses with high confidence that if LENR can produce nuclear-origin energy at room temperatures, this disruptive technology could revolutionize energy production and storage, since nuclear reactions release millions of times more energy per unit mass than do any known chemical fuel."

Although much skepticism remains, these once unconventional research programs are now receiving increased support worldwide, including state sponsorship and funding from major corporations. "DIA assesses that Japan and Italy are leaders in the field, although Russia, China, Israel, and India are devoting significant resources to this work in the hope of finding a new clean energy source."

A variety of theories have been advanced to explain the observed LENR phenomena. Some scientists, states the report, "now believe these nuclear reactions may be small-scale deuterium fusion occurring in a palladium metal lattice. Some others still believe the heat evolution can be explained by non-nuclear means. Another possibility is that LENR may involve an intricate combination of fusion and fission triggered by unique chemical and physical configurations on a nanoscale level." Regardless of theory, however, "This body of research has produced evidence that nuclear reactions may be occurring under conditions not previously believed possible."

The DIA analysts are well aware of the enormous implications of this work: "If nuclear reactions in LENR experiments are real and controllable, DIA assesses that whoever produces the first commercialized LENR power source could revolutionize energy production and storage for the future. The potential applications of this phenomenon, if commercialized, are unlimited."

The report ends by citing a number of specific practical applications of cold fusion technology, which was once dubbed "Bad Science." "LENR could serve as a power source for batteries that could last for decades, providing power for electricity, sensors, military operations, and other applications in remote areas, including space. LENR could also have medical applications for disease treatment, pacemakers, or other equipment."

And, of course, the military applications do not go unnoticed. "Because nuclear fusion releases 10 million times more energy per unit mass than does liquid transportation fuel, the military potential of such high-energy-density power sources is enormous. And since the U.S. military is the largest user of liquid fuel for transportation, LENR power sources could produce the greatest transformation of the battlefield for U.S. forces since the transition from horsepower to gasoline power."

Cold Fusion Is Hot Again

It became obvious that the tide was turning on the subject when the CBS News Magazine program *60 Minutes* did a segment on cold fusion, produced by Denise Schrier Cetta, in April of 2009. The tagline for the segment was "Once Considered Junk Science, Cold Fusion Gets A Second Look By Researchers."

To find out whether cold fusion was more than a tempest in a teapot, *60 Minutes* asked an independent scientist, Rob Duncan, who is vice chancellor of research at the University of Missouri and an expert in measuring energy, to accompany correspondent Scott Pelley to Israel, where a lab called Energetics Technologies had reported some large energy gains in their experiments. Duncan, who thought cold fusion had been debunked, nonetheless agreed and spent two days examining the Israeli lab's cold fusion experiments to determine whether

their measurements were accurate. Afterwards Duncan told Pelley, "I thought, 'Wow. They've done something very interesting here.'" Then after searching for an explanation other than a nuclear effect to explain the results, Duncan admitted: "I found that the work done was carefully done, and that the excess heat, as I see it now, is quite real." Those are words he never thought he would ever say, he told Pelley.

60 Minutes found that the Pentagon was uttering those very same words. DARPA, the Defense Advanced Research Projects Agency, did its own analysis of cold fusion experiments and *60 Minutes* managed to obtain an internal memo that concludes there is "no doubt that anomalous excess heat is produced in these experiments."

While cold fusion researchers are now beginning to feel vindicated, Martin Fleischmann, "the man who announced cold fusion to the world" and who was discredited in the process, thought back on the past 20 years and told Pelley that he viewed them as "a wasted opportunity." But he seemed willing, despite being "hindered by years, diabetes, Parkinson's disease and maybe a little bitterness," to have another go at it.

60 Minutes deserves a lot of credit for stepping out-of-the-box and following a story that was decidedly out of the mainstream.

Does Size Matter?

The basic scientific issue at the center of cold fusion research is how low-energy chemical energies can trigger high-energy nuclear reactions. Indeed there are now numerous published experiments, in which deuterons have been inserted or loaded into a solid, that have produced energies far beyond what can be explained chemically.

But not always reliably. "Most people believe that materials issues are at the heart of current inabilities to fully reproduce and control LENR experiments," wrote David Nagel, adjunct professor of engineering and applied sciences of The George Washington University in Washington, D.C, in a scientific review of the 15th International Conference on Cold Fusion in Rome originally published in *Infinite Energy Magazine*.

Could nanostructured materials be the solution to this vexing problem? There has been a recent breakthrough in which excess heat in nanostructured materials was confirmed by four labs, starting with the work of Dr. Yoshiaki Arata, and Yue-Chang Zhang of Osaka University in Japan. Arata and Zhang found that excess energy can be reliably generated at room temperatures by exposing finely divided palladium powder to deuterium gas. The material used by Arata and Zhang had an initial particle size near 5 nanometers. (To put this in perspective a nanometer is a billionth of a meter, or about 50,000 times finer than the average human hair.) The researchers found that surface area plays an important role in obtaining a solid-state nuclear reaction. But while there is good agreement that it is crucial to have small particles, there is little understanding about why the effect occurs and what role surface area plays.

Has a method finally been found to control excess power production so that a fixed and predictable amount can be obtained?

Fair and Balanced

Long before the DIA report was released, the *Journal of Scientific Exploration* had planned a "special issue" to highlight the work being done on this important phenomenon without mainstream recognition. The winter 2009 issue contains a balanced presentation of cold fusion research results and discussion of theoretical issues, free of the stridency and dogmatism that has often characterized the debates. Marissa and Scott Little, from EarthTech International at the Institute for Advanced Studies at Austin, Texas, contribute two papers. "Cold Fusion: Fact or Fantasy?" is an introductory survey and discussion of the replicability problem in cold fusion research. The Littles have tried unsuccessfully for years to obtain conclusive evidence of the phenomenon, but they remain admirably open-minded on the topic. Their second contribution, "'Extraordinary Evidence' Replication Effort," is an experimental paper in which they provide reasons for thinking that a result they successfully replicated, and which some consider to be of nuclear origin, is of chemical origin instead.

For balance, physician and electrical engineer Mitchell Swartz contributes a long and detailed report on successful experimental work, titled "Survey of the Observed Excess Energy and Emissions in Lattice Assisted Nuclear Reactions."

These journal articles are followed by 16 long, previously unpublished abstracts on cold fusion from the Proceedings of the Symposium on New Energy Technology at the American Chemical Society meeting in Salt Lake City, Utah, held on March 22–26, 2009. These papers offer a feel both for the variety of cold fusion research currently underway and also for the diversity of ostensibly positive results achieved over the last 19 years.

"The study of so-called cold fusion, or LENR, deserves close attention for several reasons," says Dr. Stephen Braude, the editor the *Journal of Scientific Exploration*. "For one thing, a number of responsible and competent scientists seem repeatedly to get intriguing results which received scientific wisdom says should not occur. On the other hand, those results have not been replicated by other responsible and competent scientists. Not only is there much material here for sociologists of science, but one can only wonder to what extent experimenter expectancy might account for the bifurcation of cold fusion researchers into either successful or unsuccessful experimenters. It may well be that the psychodynamics of cold fusion research are far more complex and messy than either its proponents or opponents like to think. In fact, although most LENR researchers would probably resist the suggestion, it's worth considering whether—or to what extent—their results are a psychokinetic effect."

Book Reviews by Michael Schmicker and Michael Grosso

The Extreme "Adventures"

of Super Athletes—and an Unwilling Neuroanatomist

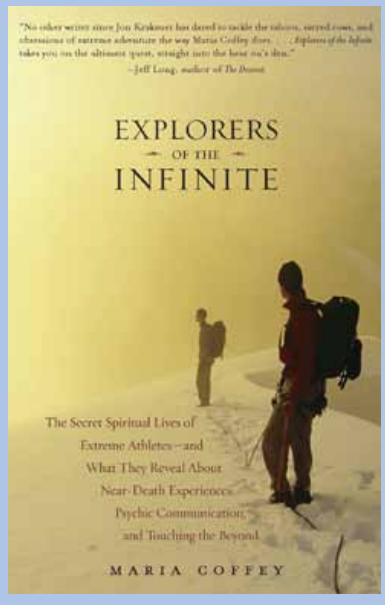
The first and last time I jumped out of an airplane, I was 17 years old. It was my mom who nearly died of fright. She had to sign a waiver that listed in gruesome detail all the ways her underage, unlucky son could die or sustain serious injury from skydiving. True to the odds, nothing went wrong. After four hours of "training," the actual skydive, from Geronimo! to hard landing, lasted just a few minutes. My weekend parachute was an adrenaline rush, but hardly death-defying or life changing.

Maria Coffey's extreme adventurers, in contrast, push themselves physically and psychologically to the breaking point. Skydiver Cheryl Stems jumped from an airplane 352 times in 24 hours, setting a Guinness World Record. Tanya Streeter free dove without oxygen to a depth of 525 feet below the ocean's surface holding her breath for almost 3.5 minutes, her heart rate plummeting to five beats a minute, before resurfacing. Cyclist Jure Robic pedaled for 3042 miles across the continental U.S. in 8 days, 19 hours and 33 minutes.

Such super-athletes suffer mind-numbing exhaustion, unbearable pain, intense solitude, sudden terror, and narrow escapes from near-death conditions that parapsychologists know can generate paranormal experiences. And the heroes of this book have a journal's worth, experiencing time distortions, altered states of consciousness, telepathic communications, out-of-body experiences, precognition, premonitions of death, and visions of the dead.

The reading pleasure for me came less from the garden-variety paranormal experiences these crazies report than from the god-awful, insane exploits which trigger them. Fifty-five-year-old ultra-marathoner Marshall Ulrich had a classic out-of-body experience running the Badwater, a 135-mile, non-stop foot race across Death Valley in July when daytime temperatures can hit 129 degrees Fahrenheit. He's done it 13 times and won it four times. Insanely, he once did it four times back and forth, non-stop, for over 77 hours, while pulling a modified baby jogger loaded with 200 pounds of water, ice, and spare clothes. In 1993, while trying to break his own record, he suddenly stepped out of his body. From above, he watched himself running along, "like watching myself on a movie screen." He remained out of body all night, until the next morning when he realized that "dawn was coming, the sun was about to rise. I knew it was time to go back into my body." (Skydiver Sterns experienced a similar, extended OBE during her non-stop jumping.)

"Many mountaineers have sensed unexplainable presences in the high mountains," notes Coffey. American climber Lou Whittaker in 1989 was guiding the first American assault on 28,169-foot-high Kanchenjunga in the Himalayas, the third tallest mountain in the world. At his base camp, he kept sensing the presence of a middle-aged, friendly Tibetan woman spirit who communicated with him mentally, telling him everything would go OK. His wife Ingrid arrived at the base camp shortly after Lou had departed for the summit, but her ascent to 16,000 feet was so fast she suffered severe altitude sickness. She spent three days in agony in Lou's tent, ministered to by the same Tibetan spirit. "She was wearing a headscarf and a long dress. She was shadowy and two-dimensional, like a silhouette." The spirit would put her hand on Ingrid's forehead, very comforting, and help her to roll over. She didn't speak; the two women communicated telepathically. Two months later, after they had returned to the States, Ingrid finally told Lou about her strange helper. Stunned, he admitted seeing her too. They're convinced it wasn't a hallucination, since both sensed the same apparition. Coffee notes similar "spirit friends" assisted and comforted many well-known adventurers in their perils, including Antarctic explorer Ernest Shackleton during his desperate 36-hour trek across frigid South Georgia Island; aviator Charles "Lucky" Lindbergh on his record-breaking, non-stop transatlantic flight to Europe in 1927; and mariner Joshua Slocum, the first man to sail solo around the globe.



Explorers of the Infinite: *The Secret Spiritual Lives of Extreme Athletes and What They Reveal About Near-Death Experiences, Psychic Communication, and Touching the Beyond* by Maria Coffey. Tarcher Penguin, 2008.

In 1997, Tony Bullimore was attempting to duplicate Slocum's feat, competing in the around-the-world Vendee Globe single-handed yacht race. Two months into the race, a fierce storm in the Southern Ocean rolled his boat, trapping him upsidedown in his watertight cabin for almost five days. Race officials informed his wife, Lalel, that his upturned boat had been spotted in huge seas; he was presumed dead. That night, kneeling by her bed, she received a telepathic message from him.He was alive, he had food and water, but he was exhausted and had to sleep. The following day, he mentally spoke to her

again. "Oh Lal, I'm in a mess. It's wet. The boat won't stop rolling. I'm cold." She told him to keep fighting. Back in his watery tomb, shivering and staring into darkness, he suddenly had a vision. He saw an Australian warship steaming for him, a boat was lowered, sailors started banging on the hull, and he watched himself swim to the surface where he was rescued. Twenty-four hours later, everything happened exactly as his vision had foretold.

Coffey presents dozens of such puzzling experiences while pondering their reality and meaning. For an outdoor adventure writer, she demonstrates a surprising familiarity with parapsychological literature, referencing among others Rupert Sheldrake's ESP research; Montague Ullman's dream lab investigations; NDE studies by Raymond Moody and Sam Parnia; plus conventional counter-explanations from popular skeptics like Susan Blackmore and Robert Persinger. Her references are understandably brief and occasionally incorrect—for example, her assertion that scientists know very little about the out-of-body phenomenon. Psychologists, physicians, and investigators such as Charles Tart, Stuart Twemlow, and D. Scott Rogo mapped the phenomenon several decades ago, and recent NDE research has advanced our understanding. We know a lot about them; it's just that, like so many other paranormal phenomena, we can't agree on where they fit in our current model of reality.

But Coffey can be forgiven for not penning a dry parapsychology book few would read. She offers enough science to ground her stories, but wisely focuses on the sense of surprise and wonder her eclectic community of daredevils find in their unexpected brushes with the infinite. As British BASE jumper Shaun Ellison puts it, "There's so much out there that we don't understand."

—Michael Schmicker

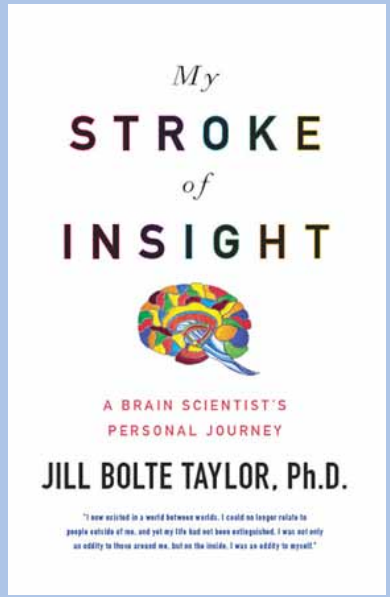
In 1996, at the age of 37, Harvard-trained neuroanatomist Jill Bolte Taylor suffered a major stroke on the left side of her brain. The stroke produced a life-transforming experience, which is the subject of her memoir. The feature of interest here lies in its special combination of facts. The first was the character of the author's hemorrhage, which affected her motor and sensory cortex, her ability to speak (Broca's area) and to understand speech (Wernicke's area), and the part of the cortex that mediates the subject's orientation in space and time. The second was that the subject was a neuroscientist able to observe, remember, and describe (brilliantly) the stages of her neuro-functional disintegration as well as her experience. The third fact concerns the nature of the experience, which had all the earmarks of profound mysticism. By the time Taylor realized she was having a stroke, finding the phone number of her colleague and dialing it, pleading for help had become a task of immense difficulties; the parts of her brain that enabled her to negotiate the external world were rapidly falling apart. In the midst of her struggle and growing fatigue, however, she also noticed a remarkable change taking place: "…I was consistently distracted by an enveloping sense of being at one with the universe…" She could no longer distinguish writing as writing or symbols as symbols; memories of her empirical self were washed away, the sense of her physical boundaries vanished, along with her internal clock; she ceased feeling like a solid being but perceived herself as something fluid and diffuse. Engulfed by a growing bliss, she still clung to the vestiges of her left-brain idea of who she was. As the left-brain chatter involuntarily died down, fear and pain retired to the background of her consciousness.

Once she could discriminate between her traumatized left-brain self and the vast right-brain consciousness that was unfolding, she felt despair at having survived her stroke, and yearned to cut loose from her shattered body. (This reaction is reminiscent of near-death experiencers.) "I felt like a genie liberated from its bottle," she writes. "The energy of my spirit seemed to flow like a great whale gliding through a sea of silent euphoria….As my consciousness dwelled in a flow of sweet tranquility, it was obvious to me that I would never be able to squeeze the enormousness of my spirit back inside this tiny cellular matrix."

Dr. Taylor's cerebral accident (due to a genetic arteriovenous malformation), achieved what mystics the world over try to achieve by means of fasting, sensory and conceptual reduction, and countless other techniques practiced from time immemorial to induce higher states of consciousness.

Her insight? This is how she put it: "My stroke of insight is that at the core of my right hemisphere consciousness is a character that is directly connected to my feeling of deep inner peace. It is completely committed to the expression of peace, love, joy, and compassion in the world." She describes various practical consequences of her experience, and sketches a new worldview, based on her personal discovery of the hemispheric duality of the brain.

Taylor, before her stroke, was an advocate for people diagnosed as mentally ill. This concern took on new meaning in light of her experience. She speaks to a certain mindset, predominantly left-brain in character, that can be more toxic than therapeutic for traumatized or mentally disturbed patients. Although a wreck in her stricken condition to the outward eye, her receptive mechanisms had sprung into high gear. During her near vegetative state she experienced height-



My Stroke of Insight: A Brain Scientist's Personal Journey by Jill Bolte Taylor. Viking, 2009.

ened empathy, which sharpened her insight into the value of therapeutic kindness and compassion. Dr. Taylor argues for a more holistic education of medical professionals. Caregivers should train their right-brain circuits and free up their capacity for love while moderating the more abstract and less sensitive left-brain functions.

As testimony to the power of this stroke-induced experience, Dr. Taylor thinks the right brain should be the basis of a general re-education of humanity. Her premise for this spectacular claim: "For me, hell existed inside the pain of this wounded body as it failed miserably in any attempt to communicate with the external world, while heaven existed in a consciousness that soared in eternal bliss." Her idea of how to bring this blissful form of awareness into the center of our lives would entail a paradigm change in the conduct of daily life.

In order to grasp from within the values and qualities of right-brain enlightenment, she recommends that we shift from over-reliance on rationalistic "mental chatter" to more esthetic and contemplative modes of thought. Everyday life is the great field of experiment; we need merely to pay attention to the flow of the now to wean ourselves from the debilitating excesses of the left brain. The more we are present to the world, the greater the influx from the right hemisphere of consciousness. The arts, moreover, are tools toward this end, and the great spiritual teachings of the world are there for us to draw upon.

Dr. Taylor's call for the re-education of humanity around the premise of right-brain consciousness is visionary, with a touch of the messianic. But if her conception is sound—her experience is one piece of testimony for it—we should listen carefully. The idea of a science of enlightenment may seem visionary; but for all we know it may be the wave of the future.

—Michael Grosso

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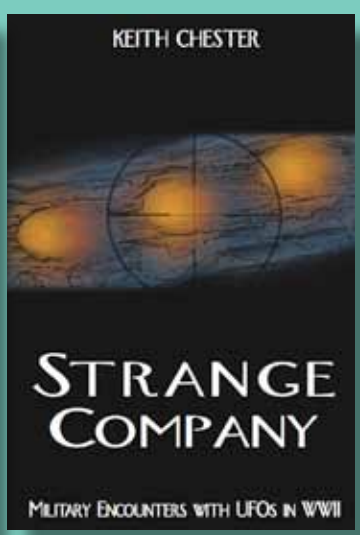

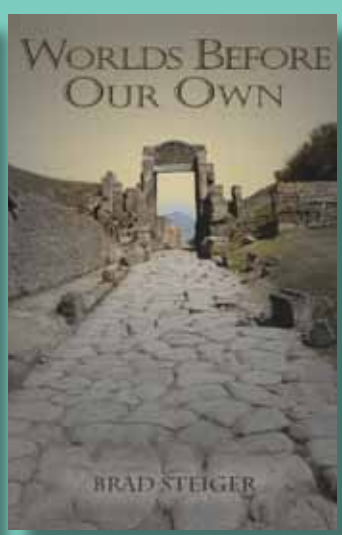

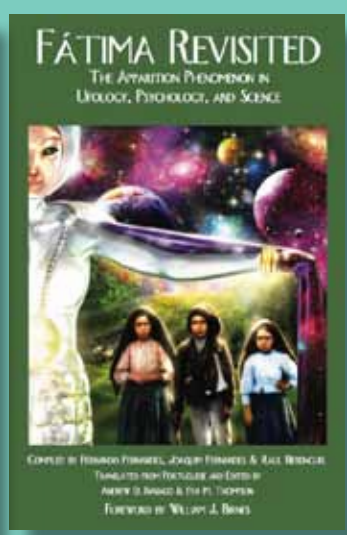

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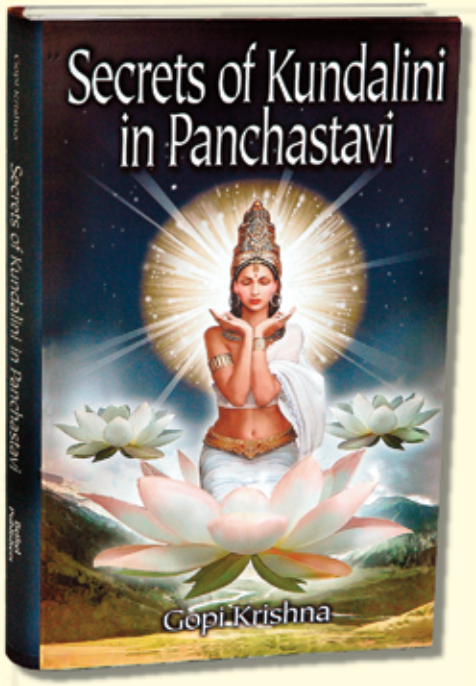

Dustjacket Illustration of the Goddess Parvati.

The Large Hadron Collider Of the Spiritual World

Like a priceless gem, lying hidden in the cavernous interior of a mountain, *Panchastavi* has lain shielded from the eyes of the world by the towering mountains that surround the beautiful Vale of Kashmir that once was a lake named Sati-Sar.

Practically nothing is known about this superb literary work—obviously by a Kashmiri Sage—to the erudite scholars in other parts of the country. How such a rare book could remain unknown and unappreciated beyond the confines of the valley for a period of more than one thousand years is a mystery for which there is no explanation at present.

Which is Best, the Intellect or Intuition in Answering the Ultimate Questions?

All the social and political orders ever formed have been only the reflections of the inner working of the minds of those who created them. Having achieved the highest state of consciousness possible at this stage of human evolution, the unknown author of *Panchastavi* wrote for the guidance of future generations, trusting that his book would survive until such time when it would be needed most, as may well be the case today.

Because, with the Large Hadron Collider almost fully operational, it is now clear to many thinkers that our intellectual power and intuitive sense have become dangerously lopsided.

Man creates his environment according to the dictates and tendencies of his intellect. Without long experience, he can never be sure about the soundness of his choice.

Intellect is the instrument for the study of of nature, and for the discovery of natural laws and forces; also for harnessing the knowledge gained for pragmatic purposes. Intellect, however, is incapable of dealing with the ultimates. A balance between reason and revelation is essential for survival.

Costing more than $9 billion, and engaging a team of some 7,200 particle physicists—1,500 full time—the Large Hadron.Collider has been called a "cathedral of science and the most terrifying machine ever built."

For Sale Online Or Direct from Bethel Publishers Feb. 1, 2010.

Unlike the Collider, *Secrets of Kundalini in Panchastavi* is the achievement of just two men separated by more than 1,000 years. Both had experienced the Reality behind the phenomenal world and both had asserted that Consciousness is the basal substance of the Universe. You will never tire of reading *Panchastavi* over and over. Printed on 70 lb. stock, with bonded-leather cover, is a book meant to last and be handed down from one generation to the next: Only $40, plus $5 for S.& H. in the U.S. and $10 for overseas. To order, visit www.kundaliniresearch.org or send a check to Bethel Publishers, at P.O.Box 1134, Darien, CT 06820.

Demons on Mars

"Scratch the surface of knowledge," writes the naturalist Chet Raymo in *Honey from Stone,* "and mystery bubbles up like a spring." Scratch the surface of Mars, and the HiRISE camera aboard the Mars Reconnaissance Orbiter offers us this mystery: Aeolus scrawling strange twisting shapes across our neighbor's sensuous terrain. Aeolus is the wind god of Greek mythology, and aeolian geology was the key to solving the mystery of these newly formed dark trails on the Martian terrain. They turn out to be the work of another order of demons, the Martian dust devils. Heated by the warm surface, these spinning columns of air, some rising as much as five miles high, last just a few minutes but become visible as they pick up the light-colored dust, leaving behind the dark sands of Mars underneath.

Credit: NASA/JPL/University of Arizona

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