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Edge Science



Current Research and Insights

SPECIAL ISSUE

Hearts & Minds

Speaking from the Heart

Mind of the Placebo

**Real Drugs for
Imaginary Diseases**

A publication of the
Society for Scientific Exploration

EdgeScience #6

January–March 2011

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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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Don't miss the 30th annual meeting of the SSE!

The program, entitled *The SSE at the Forefront of Science*, will feature five sessions: The Implications of Non-locality; The Science of the Subjective; Consciousness and Living Systems; Practical Applications of Anomalies Research; and The Sociology of Scientific Evolution.

Where: Boulder, Colorado—The Millenium Hotel
When: June 9–11, 2011

Invited speakers: Larry Dossey, Pamela Rae Heath, Robert Jahn, Brenda Dunne, Dean Radin, Rollin McCraty, Larissa Cheran, Francesca McCartney, John McMichael, Walter Cruttenden, Jonathan Schooler.

See the website for updated details: www.scientificexploration.org

Cover Image: Eraxion/iStockphoto

By Jim Schnabel

Would Amnesics Make Good Psychics?

Want to be a better psychic? Maybe a bit of brain damage would help. A recent study of patients who have amnesia due to hippocampal damage suggests that their brains compensate by strengthening an evolutionarily ancient, unconscious system of perception and memory. My reading of the parapsychological literature is that this ancient system could be crucial for ESP—and if that’s so, then its compensatory boosting after brain damage could well result in better psi ability.

Eternal Sunshine, With Chance of Showers

The study appeared last April in the *Proceedings of the National Academy of Sciences*, and covered five subjects whose bilateral hippocampal damage left them unable to make new long-term memories of experiences. Their condition, anterograde (i.e., forward-going) amnesia, was recently dramatized in the film *Memento*. But a more relevant depiction appeared in *Eternal Sunshine of the Spotless Mind*—whose two lead characters have their conscious declarative memories of each other erased, yet retain unconscious, emotion-based memories that influence their actions and bring them together again.

Previous studies have demonstrated the existence of this alternate memory system by showing that anterograde amnesics can react to stimuli *as if* they remember them, even when they consciously don’t. This study was the first to highlight this alternate system not by measuring reactions but by measuring the subjects’ self-reported emotional states even after their conscious memories were gone.

The five subjects watched film clips meant to evoke sadness or happiness, and being amnesic, lost nearly all of their conscious recall for the clips’ content within minutes. But their new emotional states, aroused by the clips, dissipated much more slowly—in fact, stuck around longer than the emotions evoked by the clips in a non-amnesic control group.

Storage of the emotional content of memories is known to rely heavily on a limbic region of the brain known as the amygdala, which was undamaged in these patients and perhaps had even been strengthened to compensate for the hippocampal damage. The amygdala and other subcortical structures have often been linked to the unconscious half of what neuroscientists call “dual stream” systems of perception and memory. The idea is that one of these streams produces conscious awareness and identification of an object, while the other, evolutionarily older and faster, but unconscious stream localizes the object and triggers appropriate action (including emotional reaction).

Hippocampal damage isn’t the only type of lesion that can dissociate these dual-stream systems. In the phenomenon of “blindsight,” people with damage to the primary visual cortex lose conscious awareness of the corresponding parts of their visual field—yet can navigate through these “blind” fields quite well, and respond emotionally to stimuli presented

within these fields. Researchers have found that this unconscious blindsight pathway intercepts optic nerve signals at the thalamus and bypasses the primary visual cortex on its way to the frontal eye fields and other processing areas.

The Psi Pathway?

As I read the paper about the anterograde amnesics, I remembered my long-ago journalistic foray into the U.S. government’s “remote viewing” program. Among the prominent findings on the research side of that program were that (a) emotional content often comes through more strongly than other kinds of content; (b) psi perception often is inaccessible to direct conscious awareness when one is in a normal waking state, and instead appears only indirectly—in symbols, in emotional reactions, or in unconscious motor actions such as dowsing or automatic sketching; (c) “top down” cognitive attempts to identify a remote viewing target often distort or obscure psi perception, instead of enhancing it.

The connection between these perceptual phenomena and the unconscious “low road” phenomena seen in anterograde amnesia and blindsight seemed obvious. Of course, to the extent that psi perception truly occurs, it might flow also, or even principally, through “high road” pathways, albeit not always strongly enough to enter consciousness. I doubt that any parapsychologist has addressed this issue directly. But surely it would be worth investigating whether “low road” pathways are the most robust routes of psi perception.

A finding that they are would raise a number of interesting questions: For example, do other animals, which presumably rely more heavily on such “low road” pathways than adult humans, manifest psi abilities? Should psi research therefore be focused more on lab animals or human children than on adults? Do people with impaired “low road” pathways, for example from amygdala damage, have worse psi abilities than healthy subjects? And perhaps most intriguingly, would people with damaged “high road” pathways, such as blindsight subjects and anterograde amnesics, end up not only with boosted “low road” pathways but with better psi abilities?

Incidentally, even if the answer to that last question is *no*, it seems to me that an anterograde amnesic in other ways would make a good psychic. He would be able to report his perceptions as they occur, and by quickly forgetting them would keep his mind unusually free from distraction. In so doing, of course, he would forget whatever secret information he had just produced—and thus, in a psychic spying context, might not even need a security clearance.

JIM SCHNABEL is the author of *Remote Viewers*, among other books. He writes about science and culture at Heretical Notions (hereticalnotions.com).

LETTERS

Do Bioluminescent Ocean Organisms Behave like Coupled Oscillators?



Near the end of the article “Reports of Luminous Seas” by Patrick Huyghe in *EdgeScience* 3, the author says something I find shocking: “Most scientists consider the idea of cooperative behavior on the part of such simple animals just too farfetched.”

I’m wondering which scientists have such an opinion. It reflects ignorance of the last three decades of progress in dynamics. (The author might not be wrong though.) After

all, simple molecules exhibit just such emergent collective behaviors in chemical reactions commonly performed in school classrooms. In fact, one could reason thusly: If a layer of bioluminescent ocean organisms is behaving like coupled oscillators, then they should exhibit the following dynamic patterns: expanding bullseyes, expanding rotating spirals, propagating parallel waves, and colliding waves which which extinguish upon collision. I remember once encountering photos of just such effects on algae-filled ponds, but unfortunately had no success after an evening spent searching online. “Pond algae bullseyes” must be a less common phenomenon than I’d imagined. However, no biology is required, since the famous Belousov-Zhabotinsky (BZ) reaction produces the patterns (see below) without any nervous system, to say nothing of needing intelligence.

Either the luminescent organisms are detecting their neighbors and triggering their own flashes after a small delay time, or more likely they may be similar to the pond algae: relaxation oscillators which periodically exhaust some sort of necessary molecule which momentarily shuts down the light-producing metabolism until more becomes available.

All this could explain nearly everything except the radial pinwheels. But could the “rotating pinwheels” actually be loose spirals? Or are they just vast arrays of moving parallel lines? Viewed from a surface ship, parallel lines would appear as a pair of pinwheel-like vanishing points on opposite horizons.



Photo by Michael C. Rogers and Stephen Morris, Experimental Nonlinear Physics, University of Toronto

Of course, I am only speculating about these algae patterns being caused by consumption of metabolic chemicals. Perhaps they are instead caused by buildup of waste products. Or perhaps the algae is motile protozoa, and the entire population simultaneously changes depth in search of fresh uncontaminated environs? Anything which produces collective oscillators can produce similar patterns.

The patterns can be produced by DC high voltage on wide electrodes in gas discharge tubes. My personal “crackpot theory” is that many luminous ocean patterns may actually be AC glow-discharges. From the “maser theory” of Ball Lightning, the patterns would be driven by thunderstorms located in the United States at the antipodal region directly opposite the Indian Ocean. If so, then our best bet for observing them off India would be to refer to the real-time “lightning map” for USA storm tracking.

— William J. Beaty, University of Washington
Chemistry Department, Seattle

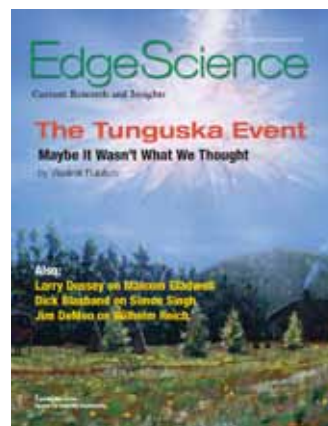
William Corliss, the author of Lightning, Auroras, Nocturnal Lights and Related Luminous Phenomena, replies:

The “luminous seas” problem is much more complicated. Certainly, chemical pattern formation in the lab occurs and doubtless also in natural bodies of water, such as ponds; I have, however, never heard of such. The lab patterns involve chemical reactions, and seem much too slow to explain the 60 mph movement of some luminous marine wheels. On these, I think you are close to the solution when you link them to thunderstorms. I would go a step further and blame them on the electromagnetic stimulation by unseen plasma vortexes just above the sea surface. These vortexes might be set up by underwater whirls or even above-surface aurora-like activity. There’s a lot of unseen electromagnetic activity that has so far escaped us. The phenomena of micrometeorology hint at this.

Where Other Science Magazines Fear to Tread

I like to think of *EdgeScience* as the refuge where *Scientific American*, *Nature*, *JAMA*, etc. fear to tread. I started reading alternative sources of news, history, literature, and science while I was still in

high school. It is amazing to me just how many ideas and people who were ignored or ridiculed back then are mainstream now. Of course there were some duds, but even those were enjoyable and gave one pause for thought.



— Michael Sklaar,
Putnam Valley, New York

by Dominique Surel

Speaking from the Heart

*Put your heart into it.
Learn it by heart.
Sing with all your heart.*

We are all familiar with such expressions, which suggest that the heart is more than a physical pump that sustains life. Throughout history, philosophers, poets, and prophets have regarded the human heart as the source of love, wisdom, intuition, and positive emotions. These important functions of the heart were recognized by many ancient societies, including the Mesopotamians, the Babylonians, the Greeks, and the Chinese. And four thousand years ago the Egyptians believed the heart played a role in the spiritual dimension; upon death, they weighed the person's heart to see how much good and evil it contained and placed the heart in special urns for burial, while the brain was discarded. The renowned French philosopher Blaise Pascal stated: "The heart has reasons that reason cannot know." Such examples are endless and demonstrate the gap between the current scientific perspective of the heart and many ancient traditions.

But the scientific view of the brain as the only system involved in all cognitive and emotional functions is actually fairly recent. While psychologists have maintained that emotions are purely mental expressions generated by the brain alone, we are now beginning to see the emergence of a new, more complete understanding of how the brain functions—and how the body, brain, and heart interact in a dynamic and complex relationship. But while most scientists have focused only on the heart and the body's responses to the brain's commands, a few researchers have begun to examine the messages the heart sends to the brain and how the brain responds to them.

The Central Role of the Heart

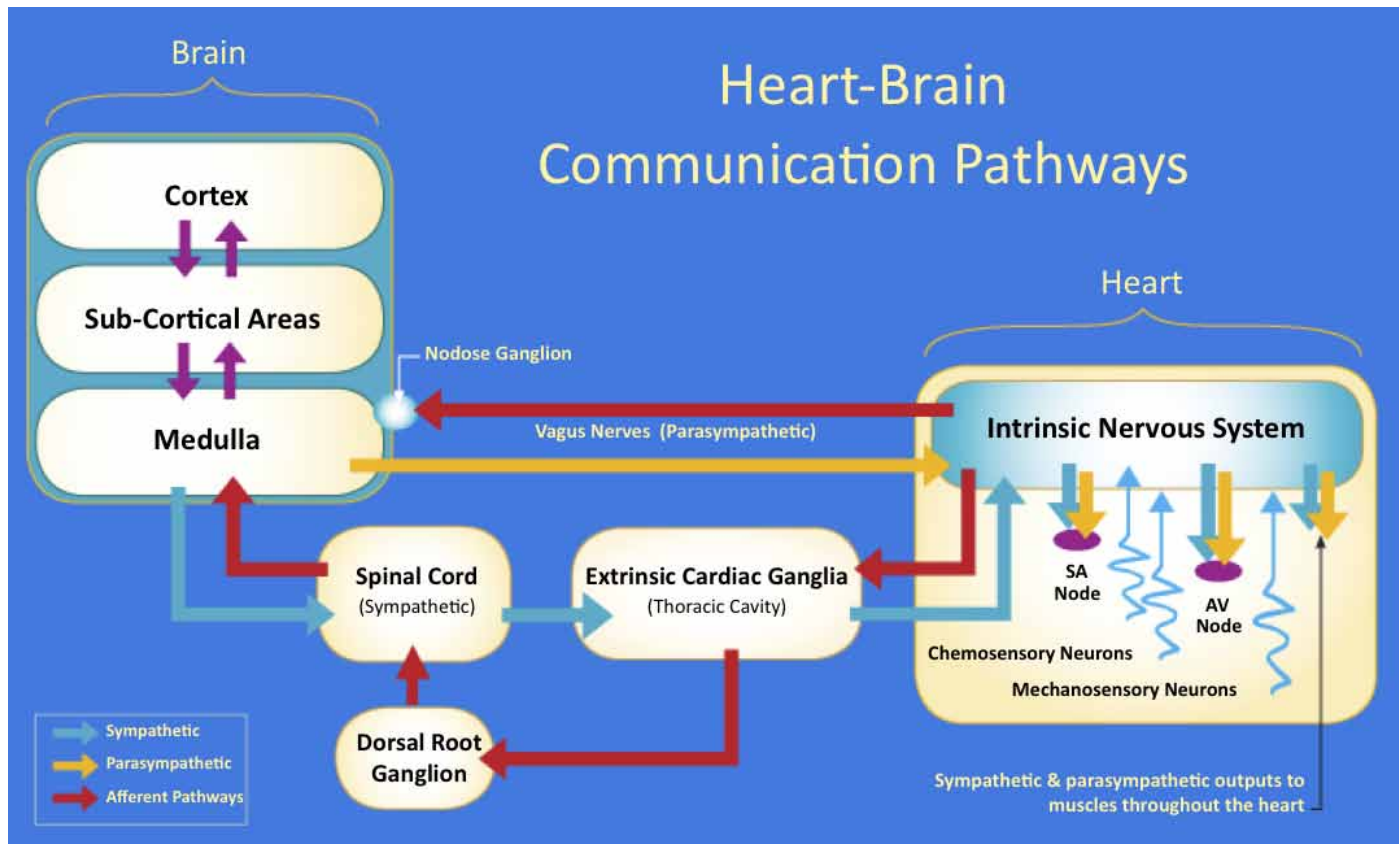
One of the primary researchers in this field is Rollin McCraty, Ph.D., Director of Research at The Institute of HeartMath, located in Boulder Creek, California. He is a Fellow of the American Institute of Stress, holds memberships with the International Neurocardiology Network, the American Autonomic Society, the Pavlovian Society, and the Association for Applied Psychophysiology and Biofeedback, and is an ad-



Comotion Design/iStockphoto

junct professor at Claremont Graduate University. McCraty, whose background is in electrical engineering, is responsible for several inventions widely used in the semi-conductor and automotive industry today. But in 1991, McCraty decided to pursue his passion and helped Doc Childre found the Institute of HeartMath. The research team they have put together has been exploring the role the heart plays in creating emotional experience and accessing intuition, as well as its role in the physiology of optimal function.

The heart is in a constant two-way dialogue with the brain. But, McCraty explains, the heart and cardiovascular system are sending far more signals to the brain than the brain is sending to the heart. This has been known since the late 1800s, but has largely been ignored. While it is recognized that these afferent signals, or signals that flow to the brain, have a regulatory influence on many aspects of the autonomic



The neural communication pathways between the heart and the brain: The heart's intrinsic nervous system consists of ganglia, which contain local circuit neurons of several types, and sensory neurites, which are distributed throughout the heart. The intrinsic nervous system processes and integrates information from the extrinsic nervous system and from the sensory neurons within the heart. The extrinsic cardiac ganglia, located in the thoracic cavity, have direct connections to organs such as the lungs and esophagus and are also indirectly connected via

the spinal cord to many other organs, including the skin and arteries. The "afferent" (flowing to the brain) parasympathetic information travels from the heart to the brain through the vagus nerve to the medulla, after passing through the nodose ganglion. The sympathetic afferent nerves first connect to the extrinsic cardiac ganglia (also a processing center), then to the dorsal root ganglion and the spinal cord. Once afferent signals reach the medulla, they travel to the subcortical areas (thalamus, amygdala, etc.) and then to the cortical areas.

nervous system, including most glands and organs, it is less commonly appreciated that they also have profound effects on the higher brain centers. Cardiovascular afferents have numerous connections to such brain centers as the thalamus, hypothalamus, and amygdala, and they play a direct and important role in determining our perceptions, thought processes, and emotional experiences.

Recent work in the relatively new field of neurocardiology has firmly established that the heart is a sensory organ and an information encoding and processing center, with an extensive intrinsic nervous system that's sufficiently sophisticated to qualify as a *heart brain*. Its circuitry enables it to learn, remember, and make functional decisions independent of the cranial brain. To everyone's surprise, the findings have demonstrated that the heart's intrinsic nervous system is a complex, self-organized system; its neuroplasticity, or ability to reorganize itself by forming new neural connections over both the short and long term, has been well demonstrated.

Some of the most seminal work on the relationship between heart–brain interactions was conducted in the 1970s

and early 1980s by physiologists John and Beatrice Lacey, who were the first to postulate a causal role for the cardiovascular system in modulating perceptual and cognitive performance. They suggested that the cardiovascular system modulates cortical functions via ascending input during a cardiac cycle from the sensory neurons in the heart, aortic arch, and carotid arteries.

McCraty and his team at HeartMath followed up this notion and developed what they call the heart rhythm coherence hypothesis, which postulates that the pattern and stability of beat-to-beat changes in heart rate encodes information over macroscopic time scales that can influence cognitive performance and emotional experience. The HeartMath researchers also found substantial evidence that the heart plays a unique synchronizing role in the body. As the most powerful and consistent generator of rhythmic information patterns in the body, the heart is in continuous communication with the brain and body through multiple pathways: *neurologically*, (through the Autonomic Nervous System) *biochemically* (through hormones), *biophysically* (through pressure and sound waves), and

energetically (through electromagnetic field interactions). This makes the heart uniquely well positioned to act as the *global coordinator* in the body's symphony of functions, binding and synchronizing the system as a whole. Because of the extent of the heart's influence on physiological, cognitive, and emotional systems, the heart provides a central point of reference from which the dynamics of such processes can be regulated.

The State of Coherence

The HeartMath research team has identified and named what is now known as the heart's *coherent state*. It is important to note that, as McCraty points out, the heart coherent state is a well-defined and measurable state that is fundamentally different from a state of relaxation and from most meditative states that require only a lowered heart rate and not necessarily a coherent rhythm.

This state, which reflects a type of optimal function, is technically called *physiological coherence*, but it is also being referred to in the literature as heart coherence, cardiac coherence, or resonance. The important point is that this is a specific functional psycho-physiological mode that can be objectively measured by heart rate variability (HRV) analysis. Heart rate variability is a measure of the naturally occurring beat-to-beat changes in heart rate.

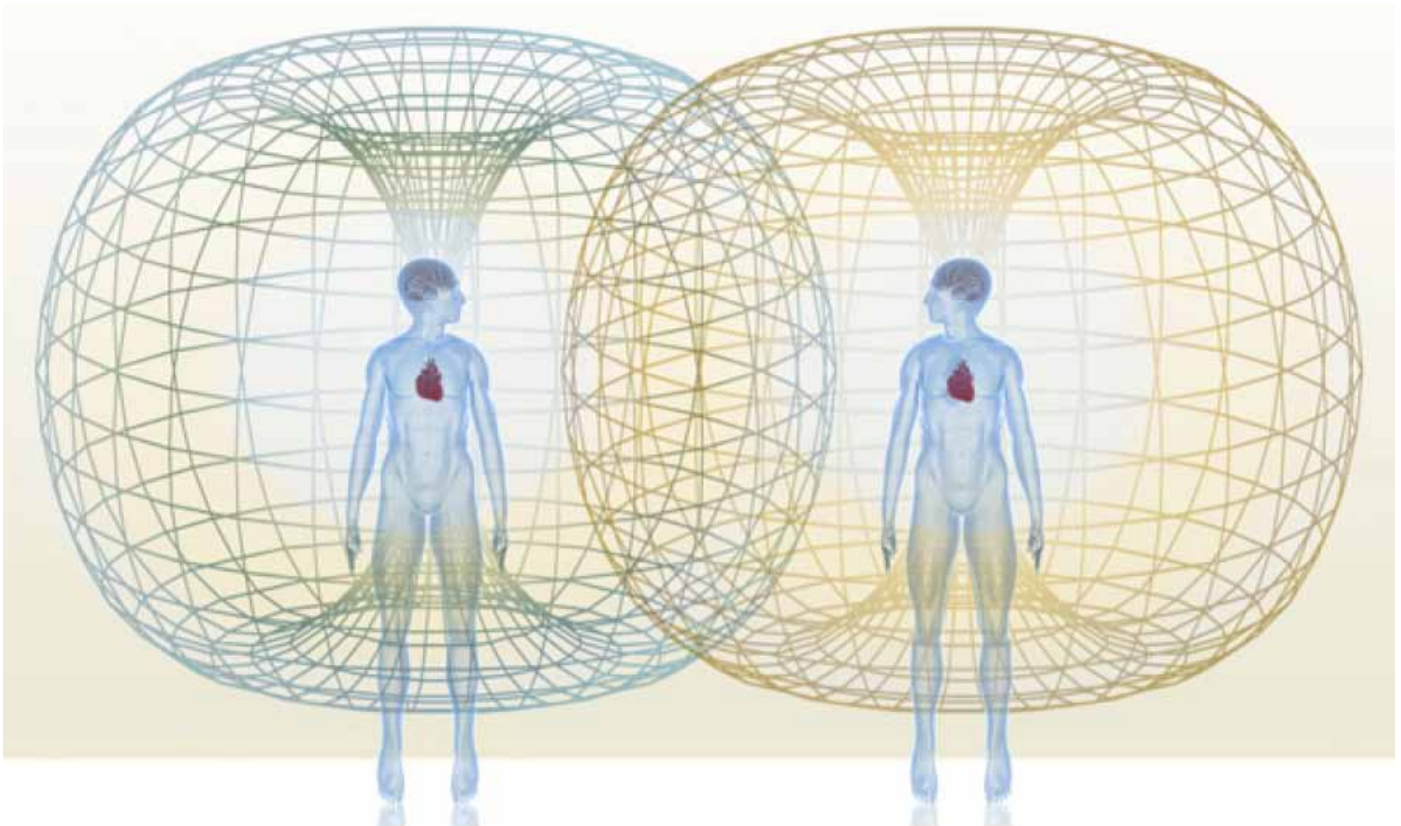
"It was really Doc Childre who first used the terms 'heart intelligence' and 'coherence,' at least that I know of," says McCraty. "He was using this language when I first met him in 1987, but it took us a few years of doing the research to really start to understand just how appropriate these terms really were."

McCraty and the research team then began to understand that there is a physiological reason that our emotions are reflected in the heart's rhythmic patterns, and this took the perception of the heart being involved in our emotions out of the metaphysical realm and grounded it in basic emotional physiology. This set the stage for their later studies on intuition.

Heart Intelligence

McCraty found compelling evidence to suggest that the heart's energy field (energetic heart) is coupled to a field of information that is not bound by the classical limits of time and space. This evidence comes from several rigorous experimental studies that investigated the proposition that the body receives and processes information about a future event before the event actually happens. One of these studies, conducted at the HeartMath laboratories, showed that both the heart and brain receive and respond to pre-stimulus information about a future event. But even more surprising is the finding that the heart seems to receive the intuitive information *before* the brain. They also found that study participants in a positive, emotion-driven, coherent state prior to the experimental protocols proved to be significantly more attuned to the information from the heart than those who were not in such a state. This suggests to McCraty that the heart is directly coupled to a subtle energetic field of information that is entangled and interacts with the multiplicity of energetic fields in which the body is embedded—including the quantum vacuum.

That the heart appears to receive intuitive information before the brain should not be all that surprising, says McCraty. It just confirms what people mean when they speak of



the *intuitive heart* or *heart intelligence*. The energetic heart is coupled to a deeper part of ourselves. When we are heart-centered and coherent, we have a tighter coupling and closer alignment with our deeper source of intuitive intelligence. In a heart coherent state there is an increased flow of intuitive information that is communicated via the emotional energetic system to the brain systems resulting in a stronger connection with our inner voice and allowing us access to the largely untapped potential for bringing our mental and emotional faculties into greater balance and self-directed control. Practicing shifting to a more coherent state increases intuitive awareness and leads to shifts in perception and worldviews from which better informed and more intelligent decisions can be made.

Energetic Information Field

The heart's electromagnetic field, by far the most powerful rhythmic field produced by the human body, not only envelops every cell of the body but also extends out in all directions into the space around us. The cardiac field can be measured several feet away from the body by sensitive magnetometers. Research conducted at HeartMath suggests that the heart's field is an important carrier of information.

"We propose," says McCraty, "that the electromagnetic fields produced by the heart form a complex energetic network that connects the electromagnetic fields of the rest of the body. In doing so, the heart's energetic field acts as a modulated carrier wave that encodes and communicates information throughout the entire body, from the systemic to the cellular levels, and even conveys information outside the body between individuals.

"The concept of an energetic information field is not a new one. Indeed, many prominent scientists have proposed models in which information from all physical, biological and psychosocial interactions is enfolded as a spectral order outside the space/time world in the energy waveforms of the quantum vacuum. Holographic principles form the basis of most of these theories and have been used to describe how information about the organization of a whole is nonlocalized—enfolded and distributed to all parts and locations via the energy waveforms produced by interactions in the brain, social structures, and the universe. We adopted a holographic perspective to describe how energy waveforms generated by the heart's electromagnetic field encode and distribute information about all structures and processes throughout the body from the cellular level to the body as a whole."

Global Coherence

After deep reflection, McCraty's continuously evolving vision took the concept of coherence and energetic fields to the macro level of the planet—and the very edge of science. "Coherence," he says, "is a state of energetic alignment and cooperation between heart, mind, body, and spirit. In coherence, energy is accumulated, not wasted, leaving you more energy to manifest intention and harmonious outcomes." McCraty's latest project is to test the hypothesis that the earth's energetic

fields (geomagnetic and ionospheric) are affected by mass human emotions and consciousness.

In the hopes of helping to generate more coherence throughout the world, McCraty also helped start the Global Coherence Initiative, a science based, co-creative project to unite people in heart-focused care and intention, to facilitate the shift in global consciousness from instability and discord to balance, cooperation, and enduring peace. The idea is to unite individuals who will use heart coherence with specific intentions in order to raise human consciousness at the global level. A good idea, indeed.

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by Kenneth Smith

The Mind of Placebo: In Search of the Perfect Medicine

There may be no better laboratory than that of the placebo response to understand the nature and mystery of mind. In recent years, interest in the placebo response has grown from being viewed as a nuisance in clinical trials, mucking up the data and unnecessarily escalating costs, to being accepted as a real phenomenon worthy of scientific investigation. Within the medical science community, investigators are now actively targeting the placebo response, trying to determine how it occurs and what might be done to harness it.

A placebo response is usually defined as a psychological response to a treatment with no proven therapeutic value. A placebo is inert; by itself, it can't trigger a therapeutic effect, so the activation of biopathways that lead to the restoration of health must occur in some other manner than by the placebo itself. The therapeutic effect of the placebo response is thought to be more than simply a matter of a disease resolving by running its course. But otherwise there is no standardization about what the placebo response means, how it is defined, or what should be done about it.

Nonetheless, a foundation for novel therapeutic intervention based on placebo research is forming. Only a few years ago, this would have been laughable and to some it remains so. But reports indicate that a growing number of physicians are of a mind to accept the role of placebo in healing. Some 45 percent to 85 percent of U.S. and European practitioners use knowledge of placebo in practice to positively influence the patient's response to therapy. It has also been reported that 96 percent of academicians in the U.S. think placebo have therapeutic effects.

The number of reported placebo responses in clinical drug trials is also increasing. This may be due to an ineffectiveness of clinical trial drugs, poor methodology, or better tracking of placebo data due to increased interest in the subject. The general public is also increasing its consciousness of the placebo response, in effect allowing people to develop cultural meaning and permission to experience it.

It seems then that the perfect medicine that capitalizes on the body's innate healing ability may be within reach. After all, the placebo effect appears to be the body's self-directed restoration of homeodynamics in the absence of a known therapeutic agent, albeit with the administration of an inert substance.



Placebo Studies

Scientific investigation has now demonstrated that there is not one placebo "response" but many, as evidenced by multiple areas of the body being influenced by different types of pathway activation for different indications. Studies focusing on depression and Parkinson's disease relating to motor performance, pain, and anxiety head the list of placebo-targeted research, while osteoporotic fracture, osteoarthritis, and cardiovascular and respiratory disorders have all been placed under the placebo microscope. There are also different mechanisms resulting from different environmental conditions such as the manner of administration of a drug, type of clinical setting, and the nature of patient/physician interaction.

Expectation

The interaction of patient and physician appears key in understanding placebo mechanisms. One area of research focuses on expectation, or the conscious influence of mind. Expectation forms by verbal cues, as when a physician deliberately sets the stage for the patient to anticipate a favorable response to treatment. For instance, a subject is led to believe that by taking an analgesic, he will experience relief of pain. There is a sharpness or attentiveness of mind; hence, expectation is tagged with conscious responses. University of Turin neuroscientist Fabrizio Benedetti, one of the leading placebo investigators, found that expectancy produced changes in pain levels and that subtle differences in verbal context significantly impacted the degree of response. In addition, the subject's desire for an expected outcome or the physician's expectations produced positive feelings that enhanced expectation and positive outcomes.

Conditioning

But expectancy is unlikely to operate as the sole factor involved in the placebo effect. Also involved is conditioning, which is usually regarded as an unconscious factor. Prior experience, or non-classical conditioning, can apparently modulate the placebo response. Memories associated with previous experiences, for instance, may be distorted and so affect the response. Classical, or Pavlovian, conditioning is also involved in the placebo response. It occurs when a subject is presented with a neutral stimulus, such as a flavored drink, and then the

drink is repeatedly associated with a drug, the unconditioned stimulus. Removing the drug but continuing the administration of the flavored drink, the conditioned stimulus, often has the same effect as being administered the drug.

Benedetti and colleagues found that while expectation triggers the naturally occurring, pain relieving chemicals in the cortex, the effects of these endogenous opioids, as they are known, may be modulated by prior experience or non-classical conditioning. Studies have shown that the specific effects produced by placebo can be reversed by drugs that block the release of these pain relieving chemicals, thereby providing evidence that the placebo activated the opioid systems.

Two opioid pathways have been described in placebo research, one centered in the cortex and the other in the brainstem. Strong expectation cues are known to affect the former, and opioid-mediated pathways in the brainstem that control respiration and heart rate are influenced by conditioning. Both areas are rich in opioid receptors and this has led to speculation that a pain-modulating pathway connects these two regions of the brain.

The role of conscious and unconscious states is not clear-cut, as one may influence the other throughout the course of a day. Previously conditioned subjects may experience placebo effects without having any expectation. And in some people, expectation can mediate the effects of conditioning. It has also been found that expectation and conditioning working in concert may produce a greater response than either acting alone. It appears that both expectation and conditioning of some form may be affecting clinical trial outcomes; the simple act of enrolling in a trial has an effect on outcome.

A Meaning Response

While the learning curve of conditioning is longer than what occurs with expectancy, these mind-shaping influences have similar effects on the patient. For both expectation and conditioning, a common denominator is that the meaning behind what is taking place is a determinant for what actually does take place. Therefore, the belief-, or belief system-based placebo response, has been called a “meaning response.” However, “meaning response” may not capture the fullness of the placebo effect unless we account for classical and non-classical conditioning as well as learning and other aspects of cognition, including all conscious and unconscious influences that shape awareness.

Luana Colloca and her colleague Benedetti make the point that medical procedures in general are associated with complex psychosocial context and meaning that might affect a therapeutic outcome. Many elements of medicine carry meaning even without such intention: apparel, manner, style, language, artifacts all set up expectation or evoke conditioned responses of one type or another. Brand names of commercial products have been known to affect responses, and the pricier the drug the higher is the expectation that it will work. Moreover, those who believe themselves to be in the treatment group of a blinded trial respond better.

Nocebo Responses

Just as science has begun unraveling the mechanisms of placebo, it is also documenting *nocebo* responses. A nocebo effect is mind turned against itself. Whereas the Latin root for placebo is “I will please,” nocebo means “I will harm.” Rather than an influence that results in a positive response, a nocebo means a person has undergone an untoward response to something outside of the intended therapy. In other words, similar dynamics as found with placebo may produce negative results whereby patients develop pathological reactions rather than those of healing. Ethics has contributed to sparse nocebo data as physicians generally do not, or should not, induce negative expectation.

Related to nocebo responses are beliefs of the patient or practitioner that may hinder the results of a therapy. If a patient feels unworthy of being healed or a practitioner is personally invested in another type of treatment, the psychological atmosphere could produce an expectation of failure, thereby determining the patient’s response. And rituals associated with healthcare may actually impede the flow of healing. According to sociologist William Bengston, ritual may block the “flow,” the organic evolution, of healing by locking in expectations that unexpectedly interfere with a positive response. While nocebo responses may pertain to different regions of the brain such as those associated with anticipatory anxiety rather than an opioid/analgesic pathways, the same mechanisms are called into play as for placebo-induced changes in pain and motor performance.

A study conducted by Ted Kaptchuk, an associate professor of medicine at Harvard, revealed that a sham acupuncture device had a greater placebo effect for pain than did an inert pill, perhaps due to the novelty of the process and the immediacy of attention. In Kaptchuk’s acupuncture pain study, both treatment and placebo groups reported adverse effects but differed in that they mimicked the information provided during informed consent, giving further credence to the power of expectation. That acupuncture and sham acupuncture treatments can produce harmful effects attributable to the experimental agent or placebo underscores the difficulty of data analysis for the use of placebo for all controlled studies.

Research Complexities

The argument that mind is centered in the brain may draw fire from some philosophical camps, but there is basis, a correlation, for this view even if it isn’t a complete representation. For instance, although different areas of the brain are affected by psychosocial (placebo) and pharmacodynamic (drugs) effects, both approaches may lessen pain.

Studies have also demonstrated that immune and endocrine system responses may result from conditioning but not from expectation. In a Parkinson’s disease pain study the researchers reported that “...expectations have no effect on hormonal secretion, although they affect pain and motor performance.” In another Parkinson’s study, patients’ expectation of successful treatment outcome produced endogenous dopamine, which is associated with cognitive, behavioral, and motor functions, and particularly reward mechanisms. Patients

having a placebo response had higher release of dopamine than those who did not. Changes in motor performance, anxiety, and pain were all seen as interrelated, which points out the difficulties in assessing the parameters of the placebo effect.

Adding to the complexities, a recently conducted controlled trial that focused on Irritable Bowel Syndrome found that the placebo group reported relief of symptoms comparable with the leading IBS drugs on the market. What distinguishes this trial is that patients in the placebo group were told they were getting placebo. Kaptchuk, one of the investigators, says subjects were told they didn't have to believe in the placebo effect, they only had to take the pills that were clearly labeled "Placebo." Kaptchuk emphasizes the sample size was relatively small and too short to determine long-term effects, but describes it as a "proof-of-principle" pilot study that deception is not necessary for placebo to work.

Merging of Research Paths

The psychological, physiological, and philosophical areas of mind come together when examining placebo responses. That a placebo response is a psychosocial phenomenon that results in physiological activity is clearly demonstrable. This means that there is at least an objective, biological means to explore and assess placebo responses.

How much cognitive, or conscious, attention is required to induce a response is unclear. There is evidence suggestive that some degree of cognitive attention is required. For example, in a study examining the efficacy of lidocaine aerosol for wound healing, patients were randomized into treatment, no treatment, and placebo groups. The treatment and placebo were administered to patients while they were unconscious, before closing the surgical wound. Treated patients responded better than the no treatment group, and the results for the placebo and no treatment groups were comparable.

On a wider stage, placebo bridges neurobiology to philosophy, social psychology to clinical design, ethics to medical practice. A placebo response is a restoration of homeodynamics without drug intervention and therefore reflects not only a state of health but the body's ability to regulate its own health. As one's state of mind influences placebo responses, we can say that the state of mind directly relates to health or disease.

As an example of mind-body interaction, the activation of opioid pathways has been deemed as only the final stage of a complex process that is poorly understood. Yet as this known biopathway is part of a stream of events, it provides at least a reference for what occurs within the body during a placebo response induced by expectation and/or conditioning. This information helps point the way to understanding the entire cascade of events that leads to the activation of opioid pathways, and serves as an example of where placebo research augments more traditional investigations.

Compounding the overall problem of examining the placebo effect, neural processes mediate interaction between the environment and the body's physical and emotional responses. Neural networks reflect, if not determine, personal meaning, and in this way ground the definition of mind in physiological activity. As meaning may vary greatly among physicians and

patients, this known placebo influence can prove to be immeasurable and therefore skew interpretations of data.

In other words, an individual's neural networks result from a unique relationship with the environment, and this may render the information gleaned from large groups, such as in clinical trials, problematic. The data gained from one placebo responder, for example, may provide a rich mine of data but be lost within the overall information gained from the study. Or one investigator's attitude may significantly influence several subjects. We then come back to the power of meaning, how it influences the mind, and thereby the outcome of a study.

The study of the placebo will require a focused, multidisciplinary effort that may benefit from knowledge gained in such non-traditional fields as energy medicine, bioenergetics, epigenetics, and intentionality, all of which expand the meaning and capacity of mind.

Bioenergetics

As commonly defined, the blossoming field of bioenergetics is the study of the flow of energy within an organism and between the organism and its environment. A branch of biophysics, this discipline is beginning to reveal the intricate cause-and-effect energetic connections between life forms and the environment. The role of biophotons in cellular signaling, the effects of electrical fields on healing, and the role of heart-centered bioelectromagnetic fields in the interactions among people are examples of this emerging field.

As physicist Milo Wolff points out, "Nothing happens in nature without an energy exchange. Communication or acquisition of knowledge of any kind occurs only with an energetic transfer. There are no exceptions. This is a rule of nature." In this light, expectation, conditioning, meaning, and other forms of learning are bioenergetic in that they form from a person's interaction with the environment.

Epigenetics

Bioenergetics escorts us into epigenetics. Bruce Lipton, a former medical school professor and the author of *The Biology of Belief*, holds that epigenetics deals with how environment, perceptions, and beliefs affect genetic expression, thus determining biological activity. He challenges the current mindset that DNA is the cell's brain. Rather, he maintains that a cell's physical and energetic environments determine genetics and cellular life. The cell membrane, rather than DNA, thereby becomes the regulator of cellular activity. As with bioenergetics, epigenetics requires understanding environmental influences and, as we have seen, this is requisite for mapping the mechanisms of placebo and nocebo responses.

Intention

Expectation and conditioning are also intentions. Both produce different biological activity but may have similar results; that is, while the respective biological pathways associated with expectation and conditioning may be different, placebo responses induced by either may result in similar outcomes.

Harnessing these processes is the practical work at hand, deliberately making mind functional for a specific purpose. When knowledge about the placebo effect is turned into a drug or other healing modality, it will no longer be placebo but bona fide therapy. There are at least two principal options for developing such a therapy. One, based on consciousness itself, is cognitive.

A cognitive technology is purposefully directed and utilizes innate resources. The laying on of hands and nonlocal, or distant, healing are examples of cognitive therapies, or technologies. Both are usually considered to be the result of the intentional application of personal bioenergy. In one study, healing with intent was used to alter pepsin enzyme activity in eggs. This method was employed to eliminate the placebo responses of human subjects, and the study incorporated 20 trials that demonstrated statistically significant results that enzyme activity was modified. Another case in point comes from the research of William Bengston. In numerous studies, Bengston has used intent to heal mice of cancer. An intriguing side effect is that mice in remote locations were also healed even through they weren't the target or even part of the experiment. Bengston has begun accounting for this phenomenon through "resonant bonding" which may bring to bear macro-entanglement among groups of mice.

In these experiments, a cognitive modality influenced biological activity, so the therapy being administered is not inert and therefore not placebo. However, since expectation and conditioning are forms of intent and directly involve placebo responses, intentionality offers another path to further investigate the placebo effect. In some manner, such as with expectation, intention is part of placebo responses. Therefore, just as the activation of opioid pathways links placebo to neurophysiology, intention offers a common reference between placebo-related psychological states and a cognitive therapy.

Material Technologies

An assortment of material therapeutic technologies (machines and drugs) serve as the second option for harnessing the placebo effect. But most such technologies are regarded as highly unorthodox and unproven by the medical community. One example is a device known as the Rife Beam Ray, which advocates purport uses precise frequencies to kill cancer cells, bacteria, and viruses. During the 1930s, Royal Rife determined that every organism and disease has a specific resonant frequency, a Mortal Oscillatory Rate. Based on destructive interference, treatment consists of transmitting a frequency to the patient that kills the disease-causing organism. Reports indicate he was very successful with treating cancer, the cause of which he attributed to a virus or an unknown "BX" organism.

Another controversial option is radionics technology, which is thought to provide diagnostic and healing capability through the application of specific frequencies to balance frequencies associated with disease. But an integral component of radionics is the operator's intent, which guides the process as his or her mind attunes to the subtle energies of the patient. A radionic feedback device, a box, acts as intermediary by providing the operator sensations that offer feedback

regarding the degree of operator-patient attunement and the nature of the remedy. Because of this cognitive aspect, radionics has been called a "psychotronic" or "psychoenergetic" technologies.

British researcher Harry Oldfield makes claims for yet another technology that measures intent as well as states of health and disease. He developed Polycontrast Interference Photography (PIP), which consists of a digital camera and proprietary software that visually depicts the energy emitted when two waveforms intersect. The resulting photonic discharge from converging energy fields provides real-time images that portray areas of disease and health as represented by colors and patterns of color and changes in those colors and patterns. Acupuncture meridians and physiological states are easily discernible, as are the effects of personal intention and environmental influences.

Resonant Molecular Signaling

One material technology currently undergoing clinical trials is represented by the Resonant Molecular Signaling (RMS) platform of Beech Tree Labs, Inc., a biopharmaceutical company. John McMichael, an immunologist and virologist, is the founder of Beech Tree and the inventor of RMS technology. Simply, RMS most often uses naturally-occurring molecules such as DNA or proteins that are administered sublingually at physiological doses, meaning the active ingredient of these drugs is not detectable above normal levels in the blood. RMS is considered to be a novel form of signaling whereby a molecule communicates to the body corrective measures to restore health.

Various RMS agents have been the focus of 14 successful and one failed FDA-authorized clinical trials. In each of these studies, the only adverse events were at a placebo level, meaning that subjects in the experimental groups experienced negative responses at levels commensurate with the control groups. In other words, the adverse effects could not be attributed to the RMS formulations. Based on clinicians' reports, communication to restore homeodynamics appeared to occur rapidly after administering the agent. For example, symptoms of influenza typically abate within 30 minutes, often within a few minutes. This anti-viral therapy is currently the focus of a FDA-authorized clinical trial. Different molecules of the RMS platform are used for a spectrum of chronic disorders, with experimental evidence indicating that often a formulation manipulates one or the other of the endocrine, nervous, or immune regulatory systems. Because of the consistency with the formulations comprising this novel therapeutic platform, McMichael also holds open the possibility of the existence of a master regulatory process that might be a key to understanding the placebo effect.

Considerations such as this led McMichael to found The Institute for Therapeutic Discovery, a non-profit research and education organization. Placebo induction and energy medicine are at the core of the Institute's mission, whereas Beech Tree is charged with research and early-stage development of RMS technology for the more traditional pharmaceutical market.

Path Forward

In the context of placebo research, states of mind clearly influence health as well as health-related technologies. On the psychosociological front, expectation and conditioning are currently viewed as the major inducers of placebo responses, while memory, learning, motivation, and anxiety reduction are regarded as minor factors. All this can be collapsed into intention, with the results manifesting in line with how the respective state of mind was formed. Does one's intention lead to placebo or nocebo responses, or perhaps to a form of technology?

A lifetime of rote conditioning, and therefore a combination of conscious and unconscious learning, may also influence a placebo or nocebo response. At any given turn, one of the minor factors such as relaxation could play a pivotal role. Placebo research is too nascent to overlook this possibility. In wider application, we need to consider all forms of conditioning, memory, meaning, and learning. What are now considered minor factors related to placebo responses could play a more significant role than currently expected. And it is conceivable that it could all be reduced to energetic mechanisms.

Science is learning about and being conditioned to the legitimacy of the placebo effect. Various approaches to understanding it are taking root and initial efforts to harness it are underway. For medical science, our understanding of the placebo response has become one of the great challenges of our time.

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by Floco Tausin

The Eye Floater Phenomenon

In the mid-1990s I met a man named Nestor who lived in the solitude of the hilly Emmental region of Switzerland. Nestor has a unique and provocative claim: that for years he has focused on a constellation of huge shining “spheres” and “strings” that had formed in his field of vision. He interprets this phenomenon as a subtle structure formed by consciousness, which in turn creates our material world. Nestor, who calls himself a seer, ascribes this subjective visual perception to his longstanding efforts to develop his consciousness.

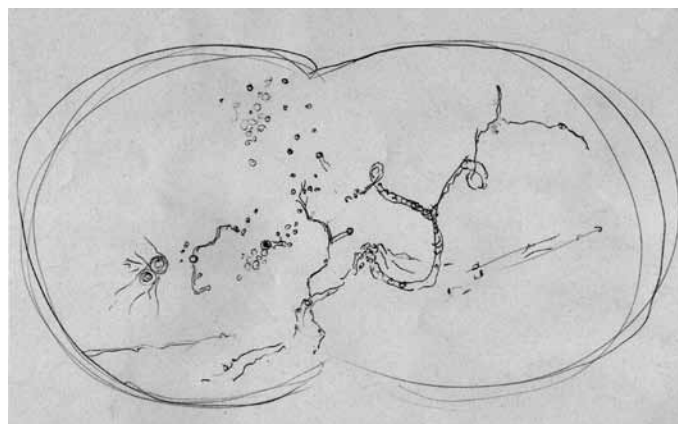
In the history of religion and art, a multitude of cases are known in which spiritually committed individuals have reported experiencing abstract or figurative subjective visual phenomena—often while in ritually induced altered states of consciousness (cf. Tausin, 2009; Müller-Ebeling, 1993). Usually, these phenomena are interpreted in terms of the individual’s cultural or religious background. Nestor’s case, however, seems to be exceptional in two regards. First, Nestor himself is aware of the ophthalmological explanation for his visual experiences: they are known as “eye floaters.” And second, floaters are a common and widespread phenomenon, experienced by a lot of people who do not claim to live a particularly religious or spiritual life.

In the course of spending time with Nestor, I tried to understand the phenomenon from an ophthalmological point of view, as well as from my own observations. My objective was to comprehend Nestor’s claims about the spiritual relevance of this phenomenon (Tausin, 2009). In this article I will address the following questions that I have been considering in the process: (1) What are floaters? (2) What makes Nestor think of floaters as a spiritual phenomenon? (3) Are there any equivalents in the history of science and religion to understanding floaters in terms of spiritually relevant visionary experiences? (4) Does Nestor’s claim require a new ophthalmological understanding of eye floaters, and how so? (5) Is it reasonable to think of floaters as a spiritual phenomenon, and to what extent?

Eye floaters in ophthalmology

“Eye floaters” (*mouches volantes* in French, or *muscae volitantes* in Latin) is a collective term used in ophthalmology for all possible opaque substances in the vitreous, the clear gel that fills the space between the lens and the retina of the eye. Many of them can be traced to physiological disorders like retina detachment, diabetic vitreoretinopathy, as well as Marfan’s, Ehlers-Danlos, and Stickler’s syndromes.

But the floaters under discussion here, which are also the most widely experienced type of floater, are considered idiopathic, or without pathological cause. They are seen as mobile and scattered semi-transparent dots and strands in the visual field, best perceived in bright light conditions. These dots and strands float about as the eyes move, which makes them hard to focus on. They are thought to be leftover embryonic stem



“Idiopathic” eye floaters in the visual field

cells, other cell debris, and hyaluronic vitreous fibrills clumped together due to vitreous liquefaction and posterior vitreous detachment (Trick, 2007; Sendrowski/Bronstein, 2010).

The structure of consciousness and the inner sense

Nestor’s statements about eye floaters differ significantly from the ophthalmologic explanation (cf. Tausin, 2009). For him, the spheres and strings emerge from consciousness; they form a coherent structure on which we project our material world, as if on a screen; they are directly connected with our will; and ultimately, our pure egoless consciousness fits into one such sphere in this structure. For Nestor, these spheres and strings are seen not with our eyes but with our “inner sense” or “third eye.” He characterizes this inner sense as an eye that gradually opens up through the withdrawal of the external senses as experienced in concentration exercises. He interprets the initial symptoms of floaters as an indication of the third eye beginning to open. The fact that many people see floaters in our contemporary Western societies means, according to Nestor, that many people already have a connection to their inner sense, even if they don’t work at it consciously—Nestor regards any activity that increases the attentiveness of a human being as “spiritual” in nature.

With such statements, Nestor ascribes an extraordinary meaning to the visual phenomena called floaters: they are a spiritual phenomenon, and thus a directly perceptible starting point for our own spiritual development, for the realization of our “true selves.” But how did Nestor come to make these claims? He says that these propositions were deduced from his own seeing. It is important to understand that his description of the spheres and strings differs from those described by most people. He doesn’t see scattered small dots and strings that drift away permanently but large, bright spheres and tubes that he is able to hold in suspension and, therefore, to see clearly. His claim to deal with what is commonly called floaters is based on his experience of a transformation, resulting from

a specific lifestyle, including an ethical attitude, a natural and balanced diet, a combination of physical and breathing exercises inspired from yogic practices, as well as the practice of concentration and meditation. The long- and short-term effects of such practices lead to altered states of consciousness that change visual perception. To be more precise, Nestor pleads to have observed the “lighting up” and “zooming in” of floaters: what were formerly transparent tiny dots and strands he now sees as large spheres and tubes full of light.



Floaters, zoom effect

The whole process, says Nestor, is goal-oriented. The “zooming in” is experienced as a forward movement within this “shining structure” of floaters. This means that a seer focuses on new spheres that either gradually or abruptly appear in the upper and rear part of the visual field. Nestor calls this visual forward movement “the path in the shining structure.” This path is not only a path of intensification and progression, but also a path of reduction. In the beginning, Nestor experienced seeing a large quantity of tiny dots and strings that moved before his eyes without any recognizable order or obvious meaning (what people usually call floaters); today, he speaks of a single huge sphere at the end of a path, the “navel,” which he is drawn to, and into which he believes he will enter to become one with the structure, experiencing a state of bliss. Nestor’s path is thus a mystical path. He believes that we lost the primordial unity with the “whole picture” in the process of embodiment and of becoming individual and separate personalities. The path in the shining structure leads back to this unity.

Floaters and entoptic phenomena

For the past 150 years, modern science has provided concepts to understand the physiological aspects of some extraordinary subjective visual phenomena. For example, many of the abstract geometric figures in indigenous art or in the ritually induced visions of shamans or yogis can be understood as “entoptic phenomena” (cf. Thurston, 1997). Entoptic phenomena are colored or bright moving geometric shapes and patterns in the visual field,

caused by certain conditions of the human visual nervous system. In the 19th century, European and American opticians and physiologists developed a broad interest in entoptic phenomena. To generate and study entoptics, they conducted experiments by stimulating brain and retina, electrically at first, and later with mind-altering substances. In the 1960s and 1970s, a number of experiments on subjects were conducted using agents such as THC, mescaline, psilocybin, and LSD. A subsequent worldwide ban on these substances interrupted the drug-based research on entoptics (cf. Tausin, 2009).

In the second half of the 20th century, some anthropologists and archaeologists cited this research to explain the abstract geometric signs often depicted in the art of shamanic indigenous societies. For example, the anthropologist Gerardo Reichel-Dolmatoff (1975; 1978; 1987; 1997) conducted field research among the Tukano Indians of the Eastern Vaupés (Colombia). The Tukano shamans use hallucinogens like *Banisteriopsis caapi* (also known as Ayahuasca, Caapi or Yage) in divinatory and medical rituals. The visions of geometric figures—circles, dots, lines, curves, zigzag lines, grids, etc. appearing in an initial phase of the visionary experience—are identified by the Tukanos with cosmological, mythological, and social concepts, and serve as an inspiration for their art. Reichel-Dolmatoff explains these signs as “phosphenes,” or brief spots of light, induced by the hallucinogens (cf. Tausin, 2009).

Another example is the archaeological controversy over the neuropsychological interpretation of the rock and cave art of the later Paleolithic (about 40,000 to 10,000 BC). Ever since the discovery of the European Paleolithic caves, archaeologists have been wondering about the importance and meaning of such geometric representations that accompany their vivid depictions of animals. In 1988, David Lewis-Williams and Thomas Dowson put forward the original thesis that Paleolithic art is inspired by entoptic phenomena (or, more specifically, “form constants”) seen and depicted by shamans or spiritual men and women during altered states of consciousness. They argue that since entoptic phenomena are culturally independent, and can only be generated by states of the visual nervous system, it’s not surprising that comparable figures can

	ENTOPTIC PHENOMENA		SAN ROCK ART		COSO	PALAEOLITHIC ART			
	A	B	C	D	E	MOBILE ART		PARIETAL ART	
I									
II									
III									
IV									
V									
VI									

Similar patterns of entoptic phenomena in different times and cultures (Lewis-Williams and Dowson 1988, p. 206 / 7)

be found in modern shamanic art (Lewis-Williams/Dowson, 1988; cf. Tausin 2009).

Towards a new ophthalmological interpretation of eye floaters

But while scholars acknowledge that the visual experience of so-called entoptic phenomena can have a cultural or spiritual relevance to their observers under certain conditions, eye floaters are tacitly excluded from this line of thinking. In my opinion, there are two main reasons for this. First, eye floaters are an ordinary phenomenon, perceived by many people in everyday consciousness. And second, floaters are explained as idiopathic opacities in the vitreous, i.e. “entophthalmic” rather than “entoptic” phenomena—eye rubbish, so to speak. Both reasons seem to mock the idea that they could have a positive, spiritual meaning to any rational being. However, I would like to reconsider these points based on Nestor’s and my own visual experience with floaters.

First, while eye floaters do show up in ordinary consciousness states, they also constantly look different, which, in my opinion, points to the fact that there is no “ordinary” consciousness, but that consciousness changes constantly. Anybody taking the time to carefully observe her or his floaters recognizes that they constantly change size, brightness, and velocity. A closer inspection reveals that this alteration depends on a number of factors, some of which are outer conditions, like the brightness and color of the background against which floaters are viewed. Other influences may involve “inner” or “psychic” conditions, like attention span, mood, degree of concentration, stress, and the like. It’s not by accident that vision improvement schools propose to influence floaters through relaxation practices, though their goal is to get rid of them (Tausin, 2009). Nestor makes essentially the same claim as this, and differs only in the degree of psychophysical abilities, like concentration, calmness, “energy metabolism,” etc., involved. Thus, it seems perfectly conceivable to me that a person’s perception of floaters could reveal certain features that are experienced as “meaningful” or “spiritual.”

Second, today’s academic ophthalmology provides a sensible explanation of floaters as “vitreous opacities.” Considering the variegated history of ophthalmological “meaning making” and objectification of this highly subjective phenom-

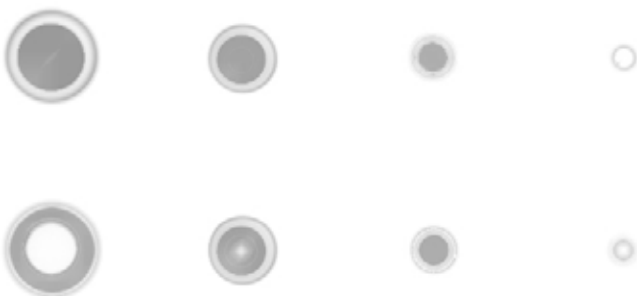
enon (Plange, 1990), this has never been an easy task. In my opinion, there is no reason to accept today’s ophthalmology’s explanation for it still fails to explain some of the more subtle floater characteristics that can be revealed through careful observation (cf. Tausin, 2009). One example is the morphological regularity of eye floaters: floater spheres are perfectly circular and concentric and show a core and a surround. Two contrasting types of spheres can be distinguished, those with bright surrounds and dark core, and those with dark surrounds and bright core. It is questionable if this morphological regularity really represents hyaluronic fibrills or cells clumped together. Another example is the change of the size of the spheres and strings: the very same sphere may appear big and diffuse or small and focused. The transition from one state to another is fluent and occurs in a matter of minutes or even seconds. For the sake of simplicity I distinguish between a “relaxed” (big) state and a “concentrated” (small) state. Generally, it seems as if most eye floaters are, at first, relaxed and thus bigger, nearer, and more transparent. Over time, however, they change into a concentrated state. But once concentration is abandoned, the spheres and strands revert to their prior, relaxed state; a quick glance away may suffice.

By contrast, debris in the eye is not supposed to change size in such a methodical manner. Nor is it supposed to light up the way floaters do in the process of concentration. The sinking motion of dots and strands is also worth closer examination: eye floaters react with great sensitivity to eye movements. It seems as if they always move in the direction in which we look. But as soon as we keep our eyes still and observe the floaters, we recognize that they sink, sometimes faster, sometimes slower. This sinking may be taken as evidence for the debris nature of floaters, debris floating in the vitreous and sinking due to the force of gravity. However, this argument is disqualified if we recall that the image of the visual world on the retina is inverted, which means that any dropping motion of floaters as seen by the observer would require the corresponding particles in the vitreous to ascend. So after careful observation, it seems that the sinking motion may be related to the state of consciousness; the motion tends to slow down in states in which floaters are seen as big and shiny. A further indication of the limits of the ophthalmological explanation is found in the everyday practice of eye doctors who try in vain to locate the floaters in their patients’ eyes—though they may find, and even treat, non-idiopathic types of floaters (cf. Tausin, 2009).

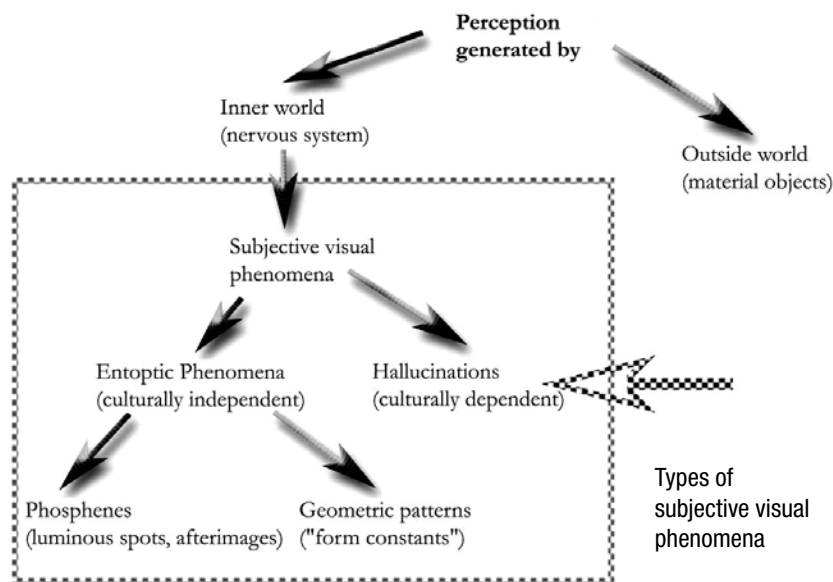
All of this suggests that idiopathic floaters should be reconsidered by ophthalmology or physiology. With the concepts at hand, and based on my subjective experiences and experiments with floaters, I strongly suspect them to be an “entoptic” rather than “entophthalmic” phenomena. In other words, I suggest that they are related or generated by the visual nervous system (Tausin, 2009).

Conclusions

Subjective visual phenomena have been regarded as significant for many societies throughout history. They have been repeatedly observed, recorded, and interpreted by spiritual women and men. In this matter, these phenomena entered



The two types of floaters spheres in a relaxed (left) and concentrated (right) state



particular cultures as a source of inspiration for artists, philosophers, and religious thinkers and believers alike. Scientific evidence suggests that many of these visionary experiences correlate with entoptic phenomena. This fits well with our thinking, which is influenced to a large extent by the cognitive and neurological sciences and their reductionist view on religious experiences as “particular brain states.” Eye floaters, on the other hand, are perceived as a “particular vitreous state,” which seems to exclude any relationship to “spirituality.” A careful observation of floaters, however, reveals that inner factors change the appearance of floaters, thereby pointing to their “entoptic” nature.

But does this necessarily suggest that floaters have a “spiritual” nature? As is the case for entoptics, it depends on the definition of “spirituality.” The case of Nestor demonstrates that floaters can have an extraordinary meaning for human beings, expressed in terms of religion and spirituality. For most Western people, however, they do not. The question, therefore, is: What do we gain by a spiritual interpretation of floaters?

For me, this interpretation, under specific conditions, can have positive effects for individuals and society. On the one hand, for individuals who suffer from the floater type under discussion, this interpretation may serve as an alternative coping strategy, completing academic ophthalmological and psychological treatment. Individuals dedicated to “knowing thyself” or following consciousness development, on the other hand, can take floaters (and other entoptic phenomena) as meditation objects and as a feedback system for psychophysical practices. A “floaters spirituality” is, in my opinion, a rather rational spirituality, based on sensual perception, research, and experiment. Scrutinizing one’s own floaters in this context could contribute toward improving or modifying the scientific understanding of floaters—and may, in turn, help bridge the gap between science and religion.

The visual path conveyed by consciousness researchers of past and present societies is a possible approach to reconciling the “spiritual” and the “material,” or, as Nestor puts it, the

“inner screen” and the “outer screen.” To me, the mobile dots and strands called “eye floaters” are a particularly suitable meditation object. Unlike other entoptic phenomena, floaters are visible in our everyday states of consciousness, and we can move them in our visual field anytime. We can play with them at will, concentrate and meditate on them, and observe and try to verify claims about them, made by friends, ophthalmologists, or seers like Nestor.

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FLOCO TAUSIN is a pseudonym. The author is a graduate of the Faculty of the Humanities at the University of Bern, Switzerland. In theory and practice, he is engaged in the research of subjective visual phenomena in connection with altered states of consciousness and the development of consciousness. In 2009, he published *Mouches Volantes: Eye Floaters as Shining Structure of Consciousness*, which merges scientific research, esoteric philosophy, and practical consciousness development, and observes the spiritual meaning and everyday life implications of these floating dots and strands in the visual field.

Book Review by Henry Bauer

Real Drugs for Imaginary Diseases

Scientific explorers are, of course, familiar with the fact that mainstream institutions persistently and forcibly resist acknowledging their mistakes and misdeeds. But *Selling Sickness* by Ray Moynihan, a health journalist for the *New England Journal of Medicine* and the *Lancet*, and Alan Cassels, a Canadian science writer, describes and documents example after example where the misdeeds are in plain view, including to the regulators who are supposed to prevent or punish them, while the corruption and the exploitation not only continue, they actually grow worse. Thus a pharmaceutical marketing specialist puts in writing that Lilly's renaming of Prozac as Sarafem and producing it in lavender and pink is a fine example of "fostering the creation of a condition [premenstrual dysphoric disorder] and aligning it with a product." Perhaps even worse are the cited examples of drug companies fudging and misreporting the results of clinical trials, for example about the increase in potentially suicidal behavior by adolescents administered Paxil, a drug that has the additional disadvantage of serious withdrawal symptoms.

The basic story is how drug companies have generated business by inventing new diseases. They employ public relations (PR) firms to convince the public that the new sicknesses exist. They distort data, and they use many devices to corrupt regulators, researchers, and practicing physicians. I became so angry as I was reading this book that several times I had to put it aside for a while.

The anger is in no way lessened by the fact that this is not a matter of conspiracy, just the actions of ordinary people embedded in an economic system of free marketing without the benefit of any hand, invisible or visible, to declare some things out of order. That permits countless people to live by the Charlie Wilson fallacy,* deluding themselves that by doing their best for themselves and for their employer they are doing good for everyone.

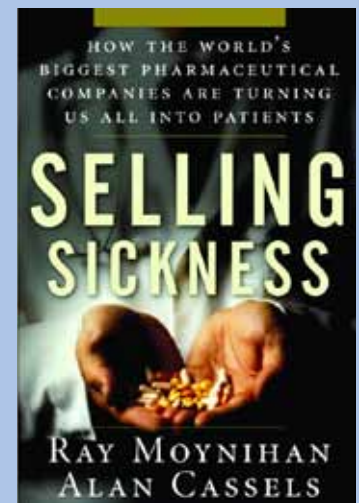
Inventing diseases? More precisely, designating as diseases conditions or circumstances that are perfectly natural and normal accompaniments of life. As human beings age, a number of things happen quite naturally and inevitably: blood pressure tends to increase as arteries become less flexible; levels of cholesterol increase (for the excellent reason that it is beneficial—on average, higher cholesterol levels correspond

with longer lifespans); libido decreases and levels of sex hormones change in a similar direction; women experience menopause, with accompanying physiological changes; bones become weaker and more brittle as they lose density.

Now, these changes are naturally correlated with other things that correlate with aging: increased frequency of heart attacks and strokes; decreased interest in sexual intercourse; increasing frequency of bone fractures. But, *of course*, correlation never proves causation. It has never been shown that high blood pressure *causes* heart attacks or strokes, no matter how plausible such a mechanism might seem a priori; it has never been shown that high levels of cholesterol *cause* heart disease, and it has never been shown that artificially lowering levels of cholesterol decreases the risk of heart disease.

Nevertheless, the pharmaceutical industry has succeeded in labeling natural processes as medical conditions warranting treatment. The whole society, not just the drug companies, have abetted this by swallowing the equating of "risk factors" with "risk," committing the fallacy of interpreting correlations as causes. In the United States and New Zealand, the wider society has also abetted its own exploitation by allowing drug companies to advertise their wares direct to the public, so that doctors are inundated with patients asking them whether the wonder drugs that preserve eternal youth are "right for them." This has been permitted since the 1990s in the U.S., when also a director of the National Institutes of Health started to allow his senior staff to accept large payments as consultants for drug companies, even when the officials were supposed to supervise approval of the company's drugs.

This book gives copious examples, but it fails to make the essential general point that "risk factor" means no more than correlation, and that lowering the level of a risk factor may have no beneficial effect whatsoever (though the book does



Selling Sickness: How the World's Biggest Pharmaceutical Companies Are Turning Us All Into Patients by Ray Moynihan and Alan Cassels, Nation Books, 2005

* Wilson, C. (1952). United States Senate Armed Services Committee hearings on nomination of Charles E. Wilson for Secretary of Defense. "For years I thought that what was good for our country was good for General Motors, and vice versa"; usually misquoted as "What's good for General Motors is good for the country."

state this specifically in the case of cholesterol). In considering high blood pressure, the book actually commits the error of confusing correlation with causation by saying that “it is one factor that can raise” the risk. “Risk factors” are analogous to “surrogate markers,” which are increasingly used in the absence of evidence that they actually measure clinical condition; thus “AIDS” patients are monitored by CD4 counts and viral load, despite the ample evidence published in mainstream peer-reviewed literature that the one doesn’t correlate with the other and that neither correlates with clinical prognosis.

The book does, however, point out appropriately that risks from side effects should always be weighed against the possible benefits of the drugs, something that the propaganda from Big Pharma strives to obscure. One pervasive theme is that certain drugs that may benefit a small number of genuinely ill people are marketed to anyone who has any symptoms that might somehow be said to come under the rubric of something that requires treatment. Thus a dangerously toxic drug, Lotronex, is urged on “up to 20%” of the population by perverting poll results to interpret any instance of constipation or diarrhea or intestinal discomfort as “possibly a dangerous condition—irritable bowel syndrome—ask your doctor”; or by taking any instance of not feeling like having sex as indicating FSD, female sexual dysfunction, which through misinterpretation of a survey can then be said to affect 43% of women!! To be able with a straight, even solemn face to market anything as dysfunctional when nearly half of all women are alleged to have it is quite a compliment to the wiles of the PR gurus, as well as further confirmation that the drug companies think of profits first, foremost, and last. Of course, numerically speaking, that is small potatoes compared with the fact that up to 90% of senior citizens are eligible for treatment for “high blood pressure”!

Perhaps the most serious consequence of the adverse side effects of drugs is that there is no system for bringing those to official attention once a drug has been approved. Individual doctors can, but are not required to, report such incidents; and drug companies are supposed to, but there is no requirement for doctors or hospitals to report such incidents to drug companies; which means that even when manufacturers receive such reports, they can play down their significance as not being representative, only suspected, and so on. According to Moynihan and Cassels, “only a tiny proportion of serious complications are ever reported to the FDA [Food and Drug Administration].”

Another way of selling more drugs is to invent not only a condition but a precursor to a condition. For those whose blood pressure is not yet classed as “high,” the drug companies have invented the condition of “prehypertension,” which of course implies that by starting treatment now, one can avoid actually developing hypertension—when in reality the only way to prevent one’s blood pressure getting higher is to die. The increase in to-be-medically-treated conditions has occurred not only with plainly and solely physical matters but also with psychiatric “disorders,” shown by the morphing of the DSM, Diagnostic and Statistical Manual of Mental Disorders, from “a slim volume” to “a massive tome.”

Increased testing is another path to more prescribing of drugs, so Merck subsidized the distribution of “bone density

testing machines” as a way to enhance sales of its Fosamax—even though clinical trials indicated that these tests are not good predictors of bone fractures, the risk of which is the very reason for resorting to Fosamax. A common tactic is to carry out a trial on individuals at high risk of some sort, find some benefit from a medication, and then market the medication as beneficial also for individuals who are only at low risk. The book claims that the biotech and drug industries are already “gearing up to promote widespread genetic testing,” since that will open opportunities to market possible remedies for hereditary ailments.

Other general points illustrated in various examples are that the side effects of some drugs actually cause the very symptoms they are supposed to treat (the anti-HIV drug AZT, and many other “antiretrovirals,” are cases in point); that advisory panels are replete with conflicts of interest; and that they keep raising bars as to what is defined as healthy—“desirable” levels of cholesterol and blood pressure keep being reduced so that increasing numbers of people are fed the respective drugs. Statistical sleight of hand is illustrated in several instances by showing how a very small reduction in *absolute* risk can be trumpeted as a breakthrough because a reduction from 2 per hundred to 1 per hundred can be described as a 50% reduction—true but misleading. Also nicely illustrated is how one can get the desired answer by phrasing a question in a particular way, as pollsters for political parties and PR shills for drug companies well know.

Drug companies fund research, pay researchers and doctors as “consultants,” “lecturers,” etc., and pay for conferences and attendant perks. They carry out the clinical trials on whose basis drugs are approved, with no requirement that the results of all trials be revealed. Drug companies pay medical journals to publish “supplements” containing material solicited or written by the companies themselves. The drug companies set up fake “grassroots” organizations masquerading as ordinary people concerned about irritable bowel syndrome and other to-be-sold ailments, so common a practice that it has a name, “astroturfing”; which might also describe the practice of hiring celebrities to offer fake testimonials—a survey is cited to the effect that $\frac{2}{3}$ of all health charities and patient advocacy groups in Britain are funded by drug companies. In popular articles, celebrities can be cited as making claims that drug companies would never be permitted to make in advertisements. (Forty years on, I still recall with pleasure when my under-teenaged daughter had as a homework assignment to describe what she most liked and most disliked, and why; and her insight for the latter was, “Famous people telling lies on TV.” Would that the adult population were as perceptive.)

Another pervasive problem is that clinical trials that fail to support pharmaceutical claims are not continually pressed on the public, so that misleading propaganda exerts hegemony. For instance, the earliest full test of AZT as treatment against AIDS did not yield grounds for using it, but that was ignored.** Hormone replacement therapy continued to be

** Farber, C. (1993). “AZT IS DEATH-AIDS; Words from the Front.” *Spin*, August 1993. www.virusmyth.com/aidsfbiv/cf-bcr1in.htm. Accessed September 14, 2010.

recommended by the American College of Obstetricians and Gynecologists even after a large trial had shown increased risks of heart attacks. Newer and more expensive drugs are touted against older, better tested, cheaper remedies with fewer side effects.

These are the “sicknesses” discussed in this book that we’ve been successfully sold as medical conditions requiring treatment with drugs: high cholesterol; depression (the medications are barely better than placebo, however); menopause; attention deficit disorder; high blood pressure; premenstrual dysphoric disorder; social anxiety disorder; osteoporosis; irritable bowel syndrome; female sexual dysfunction.

Quite chastening is the fact that the strategies and tactics of the pharmaceutical industry are not only acknowledged, they are described in detail in publicly available documents, and successes are openly boasted about. The dangers to public health are underscored by the emphasis on selling drugs that supposedly treat chronic conditions and need to be taken lifelong; in that vein, it was even recommended that screening for high blood-pressure begin at age 3. The aim of lifelong drug intake is illustrated by the industry’s use of the term “lifestyle drug” and its ambition to market “treatments” for such “illnesses” as obesity, smoking, hair loss, skin aging, and sexual dysfunction, in order supposedly to “optimize quality of life.” The opportunity to market such interventions is assisted by the lack of any good way to even define the parameters of such things as obesity or female sexual dysfunction, making it rather easy to claim the effectiveness of treatments on the basis of personal anecdotes.

The book also illustrates that no one, no matter how skeptical, can possibly enquire into all the assertions made by mainstream organizations. Thus the present authors criticize preoccupation with such matters as attention deficit disorder “in the era of the global AIDS crisis,” a “crisis” just as much manufactured by interested parties as any of the examples given in the book. Another criticism is that the authors seem to misunderstand that conflicts of interest *always* have bad consequences when they describe them as “The problem is one of perception”; though the book does give some cogent examples of improper interactions among regulators, industry representatives, researchers, and medical practitioners.

I certainly recommend this book, indeed insist that it should be read by everyone. If anything it tends to try to be more fair to the pharmaceutical industries than the evidence seems to warrant. It is worth pondering, too, that the five-page Epilogue, “What can we do?”, conveys the uncomfortable feeling that no way of fixing the problems seems to be in sight or even in imagination.

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“A Faulty PK Meta-Analysis”

by **Wilfried Kugel**

After a summary of three PK meta-analyses that seem to show a genuine PK effect, the author comments on a paper published in the July 2006 issue of the *Psychological Bulletin* which suggests that all evidence of micro-PK may be due to publication bias. The author shows that this paper contains a large number of serious errors, which include data selection bias, faulty data coding, a lack of correspondence between experimental and control data sets, faulty statistical analyses, and erroneous interpretation of results. In addition, the entire negative z-score in the meta-analysis results from only one study. This meta-analysis, therefore, produced spurious results.

“Exploring the Relationship between Tibetan Meditation Attainment and Precognition”

by **Serena M. Roney-Dougal and Jerry Solfvín**

This study of advanced practitioners of meditation extends the authors’ earlier work testing the hypothesis that meditation enhances psychic awareness or “psi.” Ten (male) Tibetan Buddhist monks participated individually in eight sessions, each comprising a meditation period and a computerized test of precognition in which they were asked to rate each of four pictures on a 100-point scale in terms of how likely it was to be randomly selected as the “target” to be displayed at the end of the session. Overall, psi scores did not exceed chance expectation, and the type of meditation (mantra or visualization) did not make a difference. The correlation between years of meditation practice and psi scores was in the predicted direction but not significantly different from zero. Nevertheless, the two most experienced meditators, both Nyingma lamas, achieved significant mean psi scores.

“Eusapia Palladino: An Autobiographical Essay”

by **Carlos S. Alvarado**

Commentaries about, and the reprint of, an autobiographical essay authored by Italian medium Eusapia Palladino (1854–1918) and published in 1910. The essay conveys a view of Palladino as a person who suffered much in life and had a mission to help scientific research into mediumship. The medium did not discuss negative aspects of her performances. Due to the fact that the essay appeared during Palladino’s visit to New York City in which many authors branded her as a fraud, it may be speculated that the purpose of this autobiography was to elicit sympathy from the American public. There are several statements in the essay that show alternate or incomplete versions of particular events in her life. The differences suggest that Palladino’s essay and other discussions about the medium’s life are not reliable when it comes to specific details and to biographical accuracy.