

Evolution Deniers

• Mexican Organ Theft Legend

• Steven Pinker on September 11

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

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CHASING CHAMP

A Special Investigation of America's Loch Ness Monster

THE RORSCHACH TEST,
Fortunetellers, and Cold Reading

**RECOVERED MEMORY
TECHNIQUES**
Problems and Pitfalls

CAN MINDS LEAVE BODIES?
A Cognitive Science Perspective



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EDITOR'S NOTE

Monsters, Mind, and Memory

Loch Ness has no lock on stories of fabled underwater monsters. North America has its own, with "Champ," the alleged creature of Lake Champlain. In this issue we publish two reports of the SKEPTICAL INQUIRER's own investigative "Champ" Expedition, carried out last summer. Senior Research Fellow Joe Nickell and SI Managing Editor Benjamin Radford examined all aspects of the Champ legend. They explored the lake and its shores from tip to tip, studied all the major articles and books, talked to local residents, and interviewed witnesses of alleged sightings. As Joe says in his Investigative Files report, "We believe ours was the most wide-ranging, hands-on investigation of Champ ever conducted with an intent to solve, rather than promote, the mystery."

Ben investigated the most famous photograph of a supposed monster in Lake Champlain, the 1977 Sandra Mansi photo in what is considered the most complete and fully documented sighting of any lake monster in history. He and Joe talked with Mansi, and after an exhaustive and detailed review of both her account and the photograph decided she is probably a sincere eyewitness. Nevertheless, Ben's own in-water measurements and his analysis of the photo, based on Mansi's own estimates and testimony, reveal such severe inconsistencies with previous interpretations that this "best evidence" dissolves. Details are in his article "The Measure of a Monster."

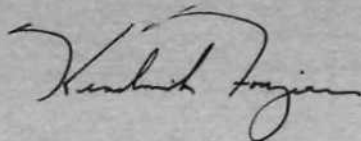
* * *

Three important articles related to the mind, mental perceptions, and misuses and abuses of psychological tests and memory-recovery techniques follow. The authors are all prominent psychological scientists.

The Rorschach inkblot test is embedded in popular lore. Many clinical psychologists have clung to the test while research psychologists have been telling them it's just a bunch of ink (bunk). In "The Rorschach Inkblot Test, Fortune Tellers, and Cold Reading," James Wood, Teresa Nezworski, Scott Lilienfeld, and Howard Garb explore the technique's powerful mystique and show why it has more in common with the psychology of astrology and palm reading than anything remotely valid.

Alan Bensley examines from a cognitive science perspective the dualistic belief that the mind is somehow something separate from the body. This dualism leads to deeply entrenched religious beliefs such as the soul and its independence from our material body and related paranormal concepts such as ghosts, astral projection, reincarnation, and the paranormal interpretation of the out-of-body experience. Cognitive science has deep insights into why our minds work that way and validates that conscious experience as a consequence of the function of brain and nervous system.

Steven Jay Lynn, Elizabeth Loftus, Scott Lilienfeld, and Timothy Lock review the problems and pitfalls of memory recovery techniques in psychotherapy. They examine a number of widely used but questionable memory recovery procedures—guided imagery, suggesting false memories, hypnosis, searching for early memories, age-regression, hypnotic age-regression, past-life regression, symptom interpretation, bogus personality interpretation, dream interpretation, and "bibliotherapy." The common thread of these procedures? Their ability to distort memory or create false memories.



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Harris Poll: The Religious and Other Beliefs of Americans 2003

That very large majorities of the American public, and almost all (but not all) Christians believe in God, the survival of the soul after death, miracles, heaven, the resurrection of Jesus Christ, and the Virgin birth will come as no great surprise. What may be more surprising is that half of all adults believe in ghosts, almost a third believe in astrology, and more than a quarter believe in reincarnation—that they were themselves reincarnated from other people. Majorities of about two-thirds of all adults believe in hell and the devil, but hardly anybody expects that they will go to hell themselves.

These are some of the findings of a Harris Poll of 2,201 American adults surveyed online between January 21 and 27, 2003, using the same methods used by Harris Interactive to forecast the 2000 elections with great accuracy.

The survey also found that women are more likely than men to hold both Christian and non-Christian beliefs. African-Americans are more likely than Whites and Hispanics to hold Christian beliefs, as are Republicans. The level of belief is generally highest among people without a college education and lowest among those with postgraduate degrees.

• The 90% of adults who believe in God include 93% of women, 96% of African-Americans and 93% of Republicans but only 86% of men, 85% of those with postgraduate degrees, and 87% of political independents.

• The 84% of those who believe in the survival of the soul after death include 89% of women but only 78% of men, 86% of those without a college degree but only 78% of those with postgraduate degrees.

• The 84% of the public who believe in miracles falls to 72% among those with postgraduate degrees, and rises to 90% among women and 90% among African-Americans.

• The 82% who believe in heaven includes 89% of women but only 75%

of men and falls to 71% among people aged 25 to 29 and those with postgraduate degrees.

On almost all the beliefs that are central to Christianity, there is a general pattern with:

- Higher levels of belief among women than among men.
- Lower level of belief among people aged 25 to 29.
- Higher levels of belief among people with no college education and lower levels of belief among those with postgraduate education.
- Higher levels of belief among African-Americans than among Whites and Hispanics.

Other interesting findings include:

- 68% of the public believes in the devil, and 69% believe in hell.
- 51% of the public, including 58% of women, and 65% of those aged 25 to 29 believe in ghosts.
- 31% of the public believes in astrology including 36% of women and 43% of those aged 25 to 29 but only 17% of people aged 65 and over, and 25% of men.
- 27% believe in reincarnation, that they were once another person. This includes

40% of people aged 25 to 29 but only 14% of people aged 65 and over.

What Christians and Non-Christians Believe

One of the more intriguing findings is that not all people who call themselves Christians believe all the conventional Christian beliefs. For example, one percent of Christians do not believe in God, 8% do not believe in the survival of the soul after death, 7% do not believe in miracles, 5% do not believe in heaven, 7% do not believe in the Virgin birth, and 18% do not believe in hell.

Even more surprising is that some people who say they are not Christian believe in the resurrection of Christ (26%) and the Virgin birth, Jesus born of Mary (27%).

Life After Death

Most of the 84% of the public who believe in the survival of the soul after death are optimists. Almost two-thirds (63%), including 75% of Christians, expect to go to heaven. Only 1% expect to go to hell. Six percent expect to go to purgatory while 11% expect to go somewhere else and 18% don't know.

—The Harris Poll, February 26, 2003

"Please indicate for each one if you believe in it or not."	All Adults	Sex		Age					
		Male	Female	18-24	25-29	30-39	40-49	50-64	65+
	%	%	%	%	%	%	%	%	%
God	90	86	93	84	82	91	90	91	95
Survival of the soul after death	84	78	89	85	88	81	86	82	84
Miracles	84	77	90	86	85	82	85	83	82
Heaven	82	75	89	83	71	83	84	80	85
The resurrection of Christ	80	73	86	76	68	81	82	81	84
The Virgin birth (Jesus born of Mary)	77	70	83	76	60	79	80	78	80
Hell	69	65	73	74	63	69	72	66	68
The devil	68	64	73	68	62	72	72	68	62
Ghosts	51	45	58	58	65	55	57	48	27
Astrology	31	25	36	37	43	37	23	32	17
Reincarnation	27	23	30	30	40	30	25	26	14

For complete data tables for this survey, go to www.harrisinteractive.com/harris_poll/index.asp?PID=359.

Biology Professor Alters Evolution Statement for Recommendations; Justice Ends Probe

The U.S. Justice Department has dropped its investigation of a complaint that a Texas Tech University biology professor was discriminating against students who did not believe in evolution.

The department announced April 22 that it had ended its probe after Professor Michael Dini eliminated the evolution belief requirement from his recommendation policy and replaced it with a requirement that students be able to explain the theory of evolution.

The Justice Department had earlier said Dini might be discriminating against students with certain religious views because he excludes from consideration a letter of recommendation for students who will not affirm a personal belief in human evolution.

All of this began in September of 2002 when a university student needed a letter of recommendation from a biology instructor to apply for a program at Southwestern University's medical school. The student, a devout believer in creationism, stated he had no problem learning about evolution but had to draw the line when informed that to receive a letter of recommendation from Dini he must "truthfully and forthrightly" affirm belief in evolution. The student felt he was being discriminated against because of his belief in biblical creation.

Dini listed three criteria that must be met before receiving a letter of recommendation. The first stated that the student must have earned an "A" in at least one class taught by Dini. The second stated that the student must be known by Dini. The third (the one in question) stated that if you cannot answer the question "How do you think the human species originated?" with sincere reference to evolution, then a letter of recommendation from Dini would not be forthcoming.

Dini stated on his Web page that "[the] central, unifying principle of biology is the theory of evolution, which includes both micro- and macro-evolution, and which extends to *all* species." Nowhere on his Web page did Dini state that a student must deny his or her religious convictions. He did explain that a medical professional who denies this principle is in grave danger of undermining both care for patients and the scientific method of discovery. Dini cited the current crisis in antibiotic resistance as an example of evolution ignored.

Dini's new recommendation policy, as stated on his Web site, now reads: "How do you account for the scientific origin of the human species? If you will not give a scientific answer to this question, then you should not seek my recommendation." He adds later that the requirement "should not be misconstrued as discriminatory against anyone's personal beliefs. Rather, the goals of these requirements are to help ensure that a student who wishes my recommendation uses scientific thinking to answer scientific questions."

The Justice Department praised the change in Dini's policy. In a statement, Ralph Boyd Jr., assistant attorney general for civil rights said: "A biology student may need to understand the theory of evolution and be able to explain it. But a state-run university has no business telling students what they should or should not believe in."

According to students, Dini's classes are rigorous. Much is expected from his students and he does not accept work of poor quality. Many students enroll in his classes because he has a reputation for being thorough. A high grade and letter of recommendation from him carries much weight when applying for medical school.

Texas Tech University Chancellor David Smith and former Texas Tech University David Schmidly have voiced their commitment to Dini's right to decline letters of recommendation. Schmidly stated that forcing a professor to write a letter of recommendation

would jeopardize the integrity of the process. Chancellor Smith pointed that there are many biology professors other than Dini from whom a student can request a letter of recommendation.

(Larry Taylor provided the original version of this article.)

DOE Seeks Polygraph Program Continuance Despite Objections by National Academy

Scientists concerned about extensive use of polygraphs at the national weapons labs had until June 13 to register their objections to U.S. Department of Energy-proposed rulemaking that would maintain the polygraph program in its present form.

The preliminary decision by DOE astonished some scientists and management at the labs because it essentially ignored the recommendations of the National Academy of Sciences. The Academy study (SI, January/February 2003), carried out for DOE at the behest of Sen. Jeff Bingaman, D-New Mexico, expressed strong reservations about the value of the polygraph testing when used to examine large numbers of people on very general grounds.

"Polygraph testing yields an unacceptable choice for DOE employee security screening between too many loyal employees falsely judged deceptive and too many major security threats left undetected," the Academy had said. The test has more utility, the NAS found, for individuals questioned specifically about particular events that occurred at particular times.

"DOE does not believe that the issues that the NAS has raised about the polygraph's accuracy are sufficient to warrant a decision by DOE to abandon it as a screening tool," DOE said in its proposed rulemaking published in the April 14 *Federal Register*.

DOE said as steward of the U.S. nuclear weapons stockpile, it has an



Polygraph machine.

obligation "to use the best tools available" to protect sensitive information. "Therefore we will continue to use counterintelligence-scope polygraph examinations as one of several tools to screen personnel requiring access to high-risk information."

Bingaman and Sen. Pete Domenici, R-New Mexico, a state with two of the three DOE weapons labs, questioned the DOE decision, as did Rep. Ellen Tauscher, D-California, whose district includes the third.

Bingaman said he was "surprised and disappointed."

"This is definitely not the more focused policy I hoped for," Domenici said. "I continue to believe that the system is too much, and an affront, especially since the polygraph program was so thoroughly criticized by the National Academy of Sciences. I hope the Department will rethink this situation."

Said Tauscher: "I am particularly surprised at the Department's decision to retain the use of the polygraph program after it was so thoroughly criticized by the National Academy of Sciences." She called for DOE to support a hearing on "the rationale that caused it to ignore the findings of a study that it itself had commissioned."

Labs scientists, including several physicians, have pointed out the hazards and essential uselessness of a test that in a screening mode (where the vast majority of people tested are not suspected of

any wrongdoing) can produce false positives far in excess of any possible true negatives (catching a spy). And they have repeatedly pointed out that spies who have taken the test have passed, and no spy has been caught by one.

DOE, the Department of Defense, and the intelligence agencies, however, are reluctant to give up a tool that is essentially used as an intimidation tactic but might possibly elicit confessions from wrongdoers.

DOE Secretary Spencer Abraham invited the national labs to participate in the notice and comment process, deadline June 14, and there was every indication that they would do so.

The labs' stance is that this is a preliminary decision that can be modified. Whether that's the case remains to be seen.

"NNSA has assured us that the present rulemaking is an interim action," said C. Paul Robinson, President of Sandia National Laboratories in Albuquerque, New Mexico. "However, I was disturbed by some of the language that

criticized the National Academy of Sciences study. I wholeheartedly endorse that study's findings, as I endorsed the earlier study by Sandia's senior scientists, who came to a similar conclusion. We will be registering our views as part of the rule-making process, but unfortunately we will have to continue the DOE counterintelligence polygraphs as required by law and continue the voluntary polygraphs as required by other government sponsors."

—Kendrick Frazier

Kendrick Frazier is editor of the *SKEPTICAL INQUIRER*.

Organ Theft Legend Resurfaces in Mexico Border Slayings

The border between Mexico and the United States has often been a dangerous area. In the past decade or so, a string of unsolved killings—many of the victims young women—have occurred near

Study Shows How Complex Functions Can Originate by Random Mutation, Natural Selection

"A long-standing challenge to evolutionary theory has been whether it can explain the origin of complex organismal features. We examined this issue using digital organisms—computer programs that self-replicate, mutate, compete, and evolve. Populations of digital organisms often evolved the ability to perform complex logic functions requiring the coordinated execution of many genomic instructions. Complex functions evolved by building on simpler functions that had evolved earlier, provided that these were also selectively favoured. However, no particular intermediate stage was essential for evolving complex functions. The first genotypes able to perform complex functions differed from their non-performing parents by only one or two mutations, but differed from the ancestor by many mutations that were also crucial to the new functions. In some cases, mutations that were deleterious when they appeared served as stepping-stones in the evolution of complex features. These findings show how complex functions can originate by random mutation and natural selection."

—Abstract, "The evolutionary origin of complex features," by Richard E. Lenski, Charles Ofria, Robert T. Pennock, and Christoph Adami

—*Nature* 423, 139–144 (May 8, 2003)

Ciudad Juarez and El Paso, Texas. The crimes have been investigated as rape-murders, and despite public outcry little progress has been made in stemming the killings or capturing the culprits.

The investigation took a bizarre turn when Mexican Assistant Attorney General Carlos Javier Vega Memije, at an April 30 conference in Chihuahua, announced that fourteen of the nearly ninety victims may have been kidnapped and killed for their organs. The implication was that the stolen organs were transplanted into rich Americans in nearby border hospitals and clinics. "Several details support the idea that these women were killed to extract their organs and sell them," the Mexican Justice Department said in a statement. Though Vega Memije did not conclude that the killings were definitely organ-related, he did say that it was "probable."

The story made national headlines, including the front page of the May 2, 2003, edition of New Mexico's *Albuquerque Journal* newspaper: "Mexico Theory: Dead Women Harvested." To his credit, Associated Press writer Mark Stevenson regarded the announcement skeptically, pointing out that "the physical evidence in the organ-trafficking theory is slim," and quoting several experts who cast serious doubts on the story. Three forensics examiners in Juarez, two of whom had examined most of the bodies in question, said they had never seen any evidence of organ theft. Stevenson noted that the organ-theft rumors, which have fueled anti-American sentiment for decades, "have always proved baseless."

Vega Memije and the Justice Department did not explain why only women would be killed for their organs, nor how it was even determined that organs were removed, since the bodies were often little more than skeletons when recovered. The main evidence seems to be a statement given by a T-shirt vendor who claims to have been paid to find three victims for another man, who then killed them and removed their organs. To date no physical evidence has surfaced supporting the story.

Publishing what is almost certainly a rumor, one news organization, News24 in South Africa, reported that "police in northern Mexico have found four human organs packed in jars labeled in English." The report quoted an unnamed prosecutor, who said that the organs were "conserved in a formaldehyde-like fluid." *The New York Daily News* (May 2) repeated the story but cautioned that "authorities weren't certain the organs were even human." According to Fox News, the prosecutors also suggested that the killings may be linked to pornographic filmmakers—thus adding a second urban legend to the story, that of the snuff film. (Presumably the women were killed in the process of making such a film.)

Organ-theft rumors are prevalent in much of Latin America, parts of Africa, and Russia. This is the second time in recent years that this particular urban legend has made headlines around the world. In late 2000, many news agencies including CNN carried a news story about a Russian grandmother who supposedly sold her five-year-old grandson for his organs. As I previously reported ("Urban Legend Makes International News," SI 25 [3] May/June 2001), the story was highly dubious and had little supporting evidence.

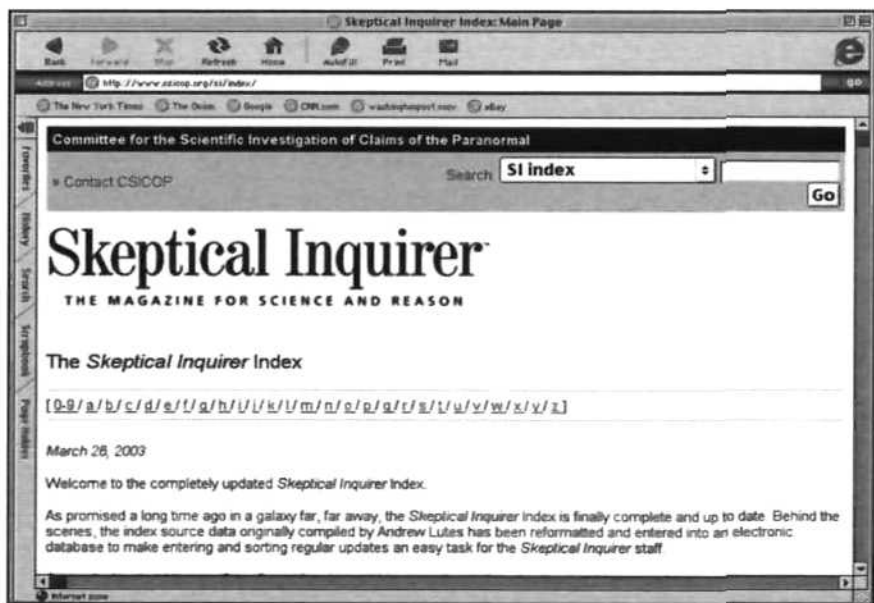
According to Stevenson, the Juarez organ-theft tale is the latest in a series of bizarre conspiracy theories proposed by prosecutors "who claimed the killings were motivated by a mix of sex and greed and committed by a street gang and a ring of bus drivers." Some believe that the organ-theft charges are simply a pretext for the federal police to take over the investigation, in place of the ineffective and maligned state police.

—Benjamin Radford

Benjamin Radford is managing editor of SKEPTICAL INQUIRER and wrote about the organ-snatching urban legend in the May/June 1999 issue.

Skeptical Inquirer Subject Index Improved, Online

In late March 2003, CSICOP Public Relations Director Kevin Christopher completed an extensive overhaul of the SKEPTICAL INQUIRER Subject Index. The index, compiled by Andrew Lutes and completed in 2001, is even more useful now that it is available online. The original version of the index was difficult to update and search, leading to complaints from many site visitors.



Christopher, a Web programmer, converted the index into a database using Perl, a programming language that is often used for Web-based text processing and data manipulation. Visitors to the CSICOP Web site will find the index at www.csicop.org/si/index/. The search engine can now be used to specify search terms that might be missed in the subject categories. Each entry is linked to a virtual shopping cart, providing an easy way purchase the back issue in which the entry was published.

An authors index should be up and running very soon, drawn from the same master database as the subject index, ensuring consistency when updated. Thanks to Andrew Lutes and volunteer Greg Gaulocher for work on the index and the new database. Suggestions and reports of omissions are encouraged from SI readers.

www.csicop.org/si/index/

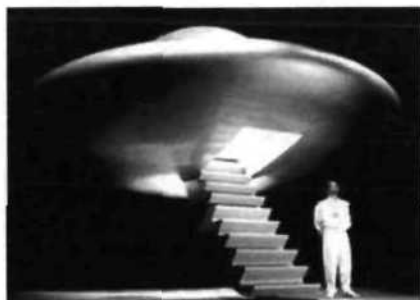
Longevity, Clonaid Receive Silver Fleece Awards for 2003

A 2003 Silver Fleece award for anti-aging quackery went to Longevity, a product Urban Nutrition, Inc., promotes at www.findlongevitynow.com as containing a "human growth hormone releaser" and an ingredient—2-aminoethylphosphoric acid—it describes as the "ultimate defense against aging and degenerative disease."

Also earning a Silver Fleece was Clonaid, the company that claimed without evidence to have cloned a human being.

S. Jay Olshansky, professor of epidemiology at the University of Illinois Chicago School of Public Health, presented the awards at a joint conference of the National Council on the Aging and the American Society of Aging in March.

Olshansky presents the Silver Fleece awards "to the product (and its producer)



Clonaid founder Raël claims that "Cloning will enable mankind to reach eternal life. The next step will be to directly clone an adult person without having to go through the growth process, and to transfer the memories and personality into this person just as the Elohim do using their 25,000 years of advanced scientific knowledge."

with the most ridiculous, outrageous, scientifically unsupported or exaggerated assertions about aging or age-related diseases."

Last year, he gave a Silver Fleece to Clustered Water, whose producers claimed on their Web site that the product "truly assists our body's natural processes in counteracting the cellular malfunctions that many health practitioners and researchers believe are responsible for degenerative health." Olshansky is co-author with Bruce Carnes of *The Quest for Immortality: Science at the Frontiers of Aging* (Norton 2001).

—William M. London

William London is Program Director and Editor, NCAHF Newsletter, National Council Against Health Fraud, Inc.

CSICOP and PhACT Attend National Science Teachers Convention

This year's National Science Teachers Convention took place in Philadelphia the weekend of March 28–30, 2003. With the encouragement and assistance of the Philadelphia Association for Critical Thinking (PhACT), the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) and the Inquiring Minds program provided scientific and skeptical materials

to educators and science professionals from across the country.

PhACT members Becky Strickland, Tom Napier, Bob Glickman, Richard Slade, and Eric Krieg distributed materials and discussed issues surrounding science education. The booth was a popular stop for convention attendees, with words of praise and requests for resources providing the impetus for further discussion. In addition to copies of the SKEPTICAL INQUIRER, selected educational materials from Prometheus Books were on display. Due in part to the encouraging response, CSICOP is planning future similar educational outreach programs in the years ahead. A full report on the conference was published in the June 2003 *Skeptical Briefs* newsletter. A Web site, www.inquiringminds.org, is available for further information about CSICOP's educational programming and developments.

Dawkins Calls Plan for Creationist School 'Educational Debauchery'

Evolutionary biologist Richard Dawkins has condemned as "educational debauchery" plans by the Vardy Foundation to open six more schools in the northeast of England that would teach creationism.

The foundation already runs the Emmanuel College in Gateshead, U.K., a nondenominational Christian school. Controversy erupted earlier when its plans to teach a creationism doctrine were disclosed.

The new announcement prompted strong reaction from Dawkins, professor of the public understanding of science at Oxford University. A zoologist (and CSICOP Fellow), Dawkins has been an outspoken proponent of evolution in his books and other writings and public appearances.

"To call evolution a faith position equated with creationism is educational debauchery," Dawkins said, according

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to a BBC report. "It is teaching something that is utter nonsense. Evolution is supported by mountains of scientific evidence. These children are being deliberately and wantonly misled."

Under the city academies program the schools will get some of their initial funding from a foundation set up by Sir Peter Vardy, who gained most of his wealth from a car dealership. But the bulk of the schools' money and all of the running costs come from the state.

It was the way Vardy defended the plan to have the foundation's schools present both the Bible account of creation and the Darwinian "theory" of species evolving over time that aroused Dawkins's ire.

"We present both," said Vardy. "One is a theory, the other is a faith position. It is up to the children. We give them an all-round education so both are presented to the students."

Newsweek 'Alt Med' Report 'Ill-Conceived,' Says 22-Item Critique

Newsweek's special report "The Science of Alternative Medicine" (December 2, 2002), read by millions worldwide and winner of a national magazine award, has been subjected to a scathing twenty-two-item critique by a leading critic of unsupported medical claims.

William M. London, editor of the National Council Against Health Fraud's (www.ncahf.org) *NCAHF Newsletter*, published the extensive critique over two issues, January/February and March/April 2003.

Although *Newsweek* expressed pride in its report, London calls it "ill-conceived." Said London: "Unfortunately, the best wisdom they offer is packaged with propaganda promoting false notions about so-called complementary and alternative medicine (sCAM)."

For the full impact of London's detailed critique readers will have to consult the original, but here are a few tidbits.

- "The notion of 'the science of alter-

native medicine' falsely implies that a meaningful category of healthcare called 'alternative medicine' exists and that it is scientifically based. But in common usage, the term 'alternative medicine' is a euphemism used by enthusiasts and profiteers to give the appearance of legitimacy to various methods promoted with scientifically implausible, invalidated, or nonvalidated claims."

- "[*Newsweek* reporter Geoffrey] Cowley cites the survey data published by Eisenberg and colleagues in 1993 as showing 34 percent of U.S. adults had received at least one 'unconventional' therapy in 1990. But critics note that the percentage was greatly inflated because the survey included use of self-groups, exercise, prayer, and other activities that are not promoted as 'CAM.'"

- "Cowley quotes NCCAM [National Center for Complementary and Alternative Medicine] head Dr. Stephen Straus: 'We want to test therapies that have a plausible basis and address some unmet need.' Cowley fails to point out NCCAM and NHLBI are wasting more than \$30 million to support a trial on chelation therapy for heart disease even though it has failed in prior trials, and the rationales for such treatment make no sense."

- "Cowley fails to recognize that it is standard care to consider patients as whole beings, and that 'holistic' is a dangerous banner under which practitioners of nonscientific methods rally."

- "[Another reporter, Anne] Underwood generalizes that 'Chinese medications tend to have fewer side effects than Western pharmaceuticals . . .' and that 'Western medicine . . . is riskier.' She provides an unsound argument for this generalization. . . ."

- "Underwood discusses the increasing demand of Westerners for Chinese medicine services without mentioning the increasing demand of people in China for modern medicine. [D. Normile, The new face of traditional Chinese medicine. *Science* 299:188-190; 2003]."

- "[David] Noonan is mistaken when he describes studies underway to determine the effectiveness of treatments

such as osteopathic manipulation in preventing ear infections as 'serious science.' It's implausible that osteopathic manipulation prevents ear infections. When NIH funds studies of treatments of implausible benefit, serious politics, not serious science, is at work."

London's critique continues on for pages, each item supported with details and published references.

"... Irrational and dubious methods are not adequate for their intended purpose, and consumers should not feel compelled to choose them," London concludes. "Instead of attempting a special report on 'The Science of Alternative Medicine,' *Newsweek* should have served its readers well by providing an exposé of 'Pseudoscience Presented as Alternative Medicine.' As Drs. Marcia Angell and Jerome Kassirer noted in a 1998 editorial in *The New England Journal of Medicine*, "There cannot be two kinds of medicine—conventional and alternative. There is only medicine that has been adequately tested and medicine that has not, medicine that works and medicine that may or may not work." □

A Note to Readers

In the March/April 2003 *SKEPTICAL INQUIRER*, pages 29-31, there appeared a column by Massimo Pigliucci entitled "The Strange Case of Cathode Rays and What Counts for Evidence." That article was a summary of material in Chapter 2 of a book by Peter Achinstein titled *The Book of Evidence* (Oxford University Press, 2001). Although this book was listed at the end under the heading "Further Reading," the author and editor deeply regret that there was no mention of the book in the body of the article or of the debt owed the book for the ideas in the column. The author and editor apologize to Professor Achinstein and to readers of this magazine.



Consider a Spherical Cow . . .

The idea of a thought experiment may seem like a perfect example of philosophical oxymoron: we usually think of experiments as things that are done manually, in practice, with the use of some measuring tools. So how can one *carry out* a thought experiment, i.e., one that requires only sitting down and thinking really hard about the possible outcomes of a certain (hypothetical) situation?

And yet thought experiments are the bread and butter not only of philosophy, but of science as well. The trick is to understand how they work and learn to distinguish good from bad thought experiments (just as there are good and bad empirical experiments). Let's start by dispelling the potential skepticism of the reader while considering a clear example of a good thought experiment: Galileo's refutation of the Aristotelian theory of gravity.

Aristotle held (in agreement with common, but fallacious, intuition) that heavier bodies fall faster than lighter ones. Galileo invited us to consider a situation in which two bodies are connected to each other, for example with a

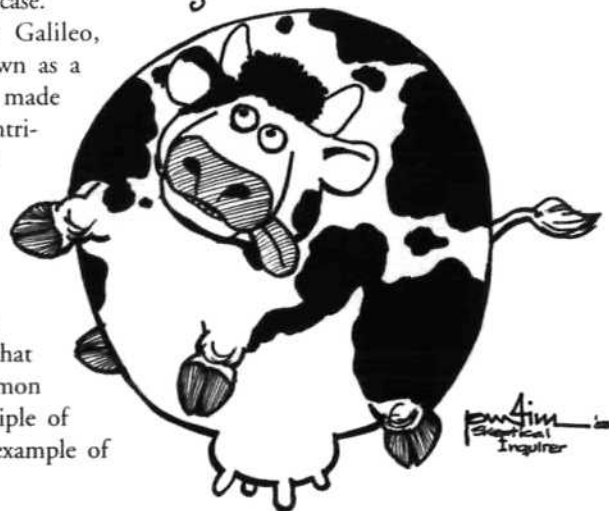
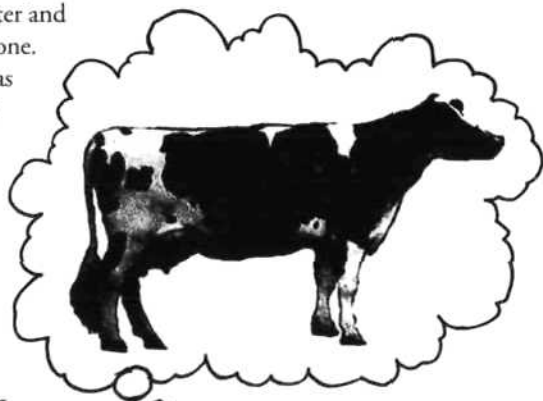
Massimo Pigliucci is Associate Professor of ecology & evolutionary biology at the University of Tennessee and author of Denying Evolution: Creationism, Scientism and the Nature of Science. His essays can be found at the Web site www.rationallyspeaking.org.

rope. Since we now have a combination of the two, the new body should fall faster than either of its two components (because its weight is higher). But, Galileo observed, the new body also has to fall at a slower pace, because of the dragging effect of the light body. Combining the two results one gets a contradiction, since the compound object is expected to both be faster and slower than the heavy object alone. Since the Aristotelian theory has led us into a contradiction, it must be rejected. Furthermore, a moment's reflection shows us what the solution is: the velocity of heavy and light bodies is the same, as physicists have indeed accepted (and then experimentally demonstrated, for example during the Apollo missions on the Moon) to be the case.

Mind-blowing, isn't it? Galileo, though he is popularly known as a *real* experimenter, actually made some of his most valuable contributions to science by simply thinking about certain problems! And he was certainly not the only one (or even the first). Other examples include Lucretius' argument attempting to show that space is infinite, Maxwell's demon illustrating the second principle of thermodynamics, Einstein's example of

the elevator introducing the restricted theory of relativity, and of course Schrödinger's famous half-alive and half-dead cat in the Copenhagen interpretation of quantum mechanics.

Naturally, there are also examples of bad, or at least uninformative, thought



experiments. One of my favorites occurs in the field of philosophy of mind, where we are often asked to think about consciousness by considering the idea of a zombie (i.e., a dead person who requires motion and some sort of will, and yet is not conscious of what he is doing). What does our intuition tell us about the zombified condition, the philosopher is then apt to continue? Well, nothing, really, because we don't have either any *experience* of zombies, nor any plausible a priori expectations of what it is like to be one. So, whatever your intuition tells you about zombies vis-à-vis consciousness, it's at best fit for the plot of a B-movie, not for advancing our understanding of neurobiology.

Why is Galileo's case a good example of a thought experiment, while the zombification of philosophy of mind doesn't seem to lead us anywhere? It seems intuitive that a thought experiment has to be based on reasonable and informative premises in order to be fruitful. The textbook joke about thought experiments concerns the problem that starts with "Consider a spheri-

cal cow..." and goes on to derive all sorts of (irrelevant to real cows) properties of these imaginary animals.

A more satisfactory answer to what makes a thought experiment good or bad must come from an understanding of what, in fact, a thought experiment is. This is no easy task, judging from the rapidly increasing literature on the topic in philosophy of science. Ernst Mach, the physicist who first coined the word "thought experiment" (*gedankenexperiment*, in German), believed that they are possible because of a vast repertoire of empirical knowledge that we acquire instinctively. What a thought experiment does, then, is to bring such knowledge into sharp focus.

Another view of thought experiments has been advanced by J. Norton, who suggested that they are (disguised) formal arguments: they start with a premise (which is often grounded in experience) and proceed by a combination of deduction and induction (see last issue's "Thinking about Science") to achieve a certain conclusion. Not every philosopher agrees, however, and J.R.

Brown has upheld thought experiments such as the Galileian one as examples of true new knowledge acquired without referring to experience at all, a rather Platonic view of the process.

The two schools represented by Norton and Brown are the extremes of a continuum of positions, which includes the idea that thought experiments are in some sense a limiting case of standard experiments, and the suggestion that thought experiments are a sort of mental model of the world. Ultimately, thought experiments by themselves are not considered satisfactory in science, and we are much happier when we can carry out a real check of a particular prediction. However, it seems that even at the stage of designing a real experiment one tries to simulate its setup and possible outcome in one's own mind, which means that thought experiments are indeed a crucial component of the scientific method.

Further Reading

T. Horowitz and G. Massey (eds.) *Thought Experiments in Science and Philosophy*, Savage, Maryland: Rowman and Littlefield, 1991. □

"The Book of Evidence is a real philosophical advance—a huge step forward in our ways of thinking about evidence."—Stathis Psillos, *Philosophy and Phenomenological Research*

"Although this book is primarily directed toward philosophers and historians of science, [it] is elegantly written and **highly accessible for scientists.**"—*Journal of Mathematical Psychology*

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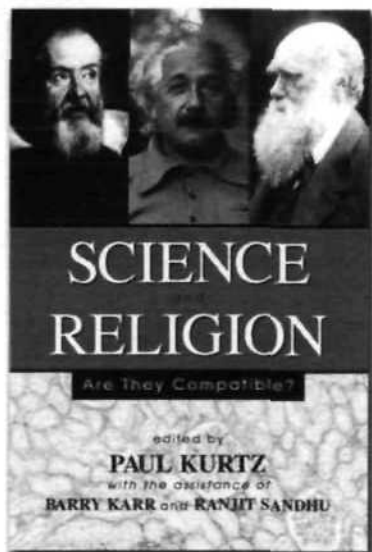
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Blind Alley: The Sad and 'Geeky' Life of William Lindsay Gresham

"Let me tell you something, kid. In the carny you don't ask nothing. And you'll get told no lies."

W.L. Gresham,
Nightmare Alley

One of the best (if not the best) "skeptical" novels ever written has to be William Lindsay Gresham's *Nightmare Alley*. The story is classic noir, depicting the rise and fall of Stanton Carlisle, an all-around faker who gets his start in a carny ten-in-one show. It opens with a revolting description of a "geek," a word that Gresham claimed he had invented, referring to the lowest of the low: an alcoholic or drug addict who was out of his head all the time. He could be prodded, cajoled, and led into working for more drinks or drugs. His job? To sit and crawl in his own excrement, as the Wild Man of Borneo, and occasionally bite the heads off chickens and snakes.

In the carnival, Stanton is the assistant to (and then the lover of) a phony medium, Madam Zeena, a perfect an-

Massimo Polidoro is an investigator of the paranormal, author, lecturer, and co-founder and head of CICAP, the Italian skeptics group.

cestor of modern showmen like John Edward and Sylvia Browne. Carlisle learns from her all there is to know about cold reading and is awestruck by how well the technique works with people: "The world is mine! I've got 'em across the barrel and I can shake them loose from whatever I want. The geek has his

whisky. The rest of them drink something else: they drink promises. They drink hope. And I've got it to hand them."

And so he leaves the carny in order to reach the big time, but his dreams are shattered by a careless performance in front of his first high-level audience and he sets out to get revenge. He

turns himself into a phony pseudo-religious spiritualist and starts preying on the rich and gullible matrons of society.

His fatal step arrives when he attempts a big swindle in collaboration with a female psychiatrist who is even more duplicitous. On the lam from the law, our anti-hero retreats into the bottle and ultimately returns to the carny, where he is forced to take a job as a geek.

It's a dark, sordid story, but beautifully told by Gresham's captivating storytelling. And, apart from a great read, this book also presents a magnificent exposé of fake psychics and mediums, with rarely found details on how the cold reading business really works. A

magician could pay quite some reward just to learn the ingenious trick used by Carlisle to move the arms of a precision balance placed under a glass case. (Don't worry, I won't spoil the surprise. You'll find it in the book.) Gresham organizes each chapter along the twenty-two minor arcana of the Tarot, a device used by later authors such as Robert Anton Wilson and Umberto Eco.

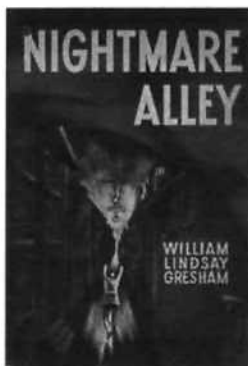
When *Nightmare Alley* came out in 1946 it was an instant success. The following year Edmund Goulding directed a film version of it, starring Tyrone Power in the role of the suave Carlisle. Though it turned out to be quite a creepy B-movie, the film is not up to the quality of the book.

However, though *Nightmare Alley* is a book often mentioned in skeptical literature, it is unfortunately seldom read—for years it was out of print and only recently reprinted in an omnibus edition (Polito 1997).

Because Gresham was also an amateur magician, student of the occult, and the author of other fine books (including one of the earliest Houdini biographies and a mesmerizing book on the history and workings of the sideshow), I was quite interested in learning more about him and his dealings with magic and the paranormal.

From Depression to War

Gresham, allegedly the descendant of a family that settled in Maryland in 1641,



was born August 20, 1909, in Baltimore, Maryland. He moved with his family to Fall River, Massachusetts, and when his father needed to pursue a factory job they all moved to New York City. He graduated from Erasmus Hall High School, in Brooklyn, the year Houdini died, 1926.

Unsure of his career path, he worked at odd jobs and as a folk singer in Greenwich Village cafés. Those were the years of the Great Depression and as America suffered its economic woes, Franklin Delano Roosevelt extolled the virtues of hard work. It was in his acceptance of the Democratic nomination for president in July 1932 that FDR began his conservation movement, proposing putting city men to work restoring the country to its "former beauty." The Civilian Conservation Corps, or CCC, a massive salvage operation destined to become the most popular experiment of the New Deal, was born. Gresham promptly joined the CCC.

His time there lasted a few years and, when he met a wealthy woman and married her, he left the CCC. After a brief stint as a reviewer for the *New York Evening Post*, he worked as an advertising copy writer and in his spare time contributed stories to pulp magazines.

In November 1936, like many idealistic young men in those days, he joined the Communist Party, taking as a name William Rafferty. The following year, after a close friend died at Brunete, he left for Spain where he fought and served for fifteen months as a medic with the Abraham Lincoln Brigade, on the side of the Republicans in the Spanish Civil War. It was during his days at the camp hospital that he met a medic who liked to reminisce about his times in a carnival. His name was Joseph Daniel "Doc" Halliday, a former seaman and male nurse. It was from him that Gresham learned all about the carny culture, habits, mentality, and language.

From Communism to Religions

After returning to the U.S. in January 1939, his marriage ended in divorce. He took to drink, spent time in a tuberculosis ward and, out of despair, attempted to hang himself in a closet, but the hook came loose and he fell to the ground. To

Gresham finally met success when *Nightmare Alley* was published in 1946 and Hollywood later turned it into a movie.

straighten up his life he went to a psychoanalyst and worked as a salesman, magician, and editor for *True Crime* magazine. In 1942 he married again, to writer and poet Helen Joy Davidman, and the couple had two sons, David and Douglas.



William Lindsay Gresham

He finally met success when *Nightmare Alley* was published in 1946 and Hollywood later turned it into a movie. With the money, the Gresham family moved out of Queens and up to a large estate in Staatsburg, north of New York City.

His second novel, *Limbo Tower*, a story that takes place on the ninth floor of a hospital about a group of people brought together during their stay in the hospital, was published in 1949 but did not match the success of the first book.

Meanwhile, after leaving both Communism and psychoanalysis behind, Gresham and Joy, deeply influenced by

ideas of writer C. S. Lewis, found religion and joined the Presbyterian Church. They announced their joint conversion in articles published in a 1951 anthology, *These Found the Way: Thirteen Converts to Protestant Christianity*.

As money started to dry up, how-

ever, tensions developed between the couple, and Gresham started to drink heavily. The alcohol occasionally turned him violent, and when it was apparent that he had a relationship with another woman the threat of divorce materialized again. Religion could not help Gresham anymore, so he turned to Zen, the Tarot, Yoga, I Ching and Dianetics, but nothing seemed to work.

While Joy was away on a vacation in England, on the advice of her doctor, Gresham started a relationship with Joy's first cousin, Renée Rodriguez. When Joy returned, divorce became the only possible solution. They were forced to sell the house to pay off the Internal Revenue Service, and Joy moved to England with the boys. In 1956 she married C. S. Lewis; their story was told in the 1993 film *Shadowlands*, with Anthony Hopkins and Debra Winger. Joy died on July 14, 1960.

Gresham, meanwhile, had married Renée in 1954, moved to Florida, and joined Alcoholics Anonymous. He had also published his first nonfiction book, *Monster Midway: An Uninhibited Look at the Glittering World of the Carny*, a fascinating treatise on carnivals, and seemed to find some peace of mind. He was living in New Rochelle, New York, when he started work on his biography on Houdini.

Magicians Through Walls

The book titled *Houdini: The Man Who Walked Through Walls* is today often criticized by Houdini experts for its inaccuracies and faults. It is certainly not comparable to Silverman's 1996 almost perfect *Houdini!!! The Career of Ehrich Weiss*. However, you have to consider that Gresham's book was only the second

this book is dedicated with the sincere admiration of the author" and, on the last page of the book, there is still one more reference to "the invaluable correspondence on the subject of Houdini and escapery in general with The Amazing Randi."

"I met Bill for the first time when I returned to New York after my European

Gresham felt that he needed advice from someone knowledgeable about Houdini. . . . Gresham's publisher suggested that the right person could be James 'The Amazing' Randi.

complete biography on the great magician, after Kellock's 1928 authorized *Houdini: His Life Story*. And Gresham succeeded in recreating not only Houdini's life but also his rough beginnings and the atmosphere of his times. With his profound knowledge of sideshows, Gresham was able to produce a book much more enjoyable, from a literary point of view, than Kellock's polished portrait and other later biographies.

When the manuscript of the book was ready, however, Gresham felt that he needed advice from someone knowledgeable about Houdini. But who could that be? There were not many magicians who performed escapology and were also literate enough to give good advice on how to improve a manuscript.

Gresham's publisher suggested that the right person could be James "The Amazing" Randi. Randi was at the time touring Europe with his magic show. "I was told that Gresham, or Bill as I knew him," Randi tells me, "needed the book quickly checked, and required info on handcuffs. He sent the manuscript to me in France, I looked it over, made some suggestions, and Bill was so happy with what I did that he promised me that my name would be the first and the last mentioned in the book."

And, true to his promise, this is what happened. The dedication reads: "To the greatest living escape artist 'The Amazing Randi' (Mr. James Randall Zwinge)

tour" says Randi, and they soon became friends. Gresham saw Randi perform many times and was also a witness to one of Randi's great televised stunts. "I have seen The Amazing Randi," Gresham wrote in a 1960 article, "walk, apparently, through the solid brick wall of a building from outside on the sidewalk. I was privy to his secret, and marveled at his ingenuity and nerve. But at the moment of the apparent dematerialization I must confess that I got a most satisfying 'cauld grue' of wonder as if in the presence of a genuine super-mundane event" (Gresham 1960).

A Red Light Levitation

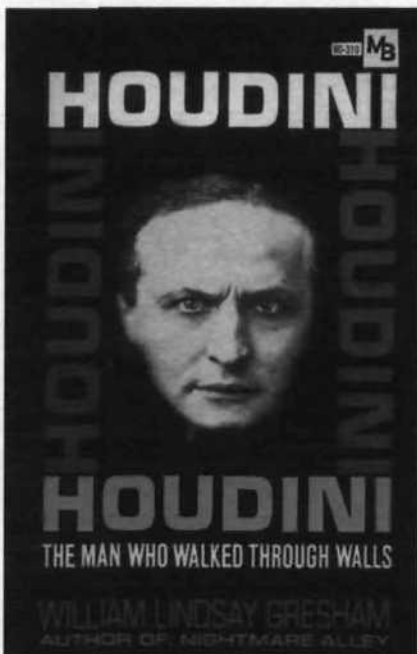
After the world of sideshow and magic, it was quite logical that Gresham's attention turned toward Spiritualism. He was fascinated by characters such as mediums Daniel Dunglas Home and Margery, and started work on two different books devoted to them.

Randi remembers: "The book on Margery, Bill told me, was going to be titled *The Blonde Witch of Boston*. He was quite impressed by the fact that reports of séances were so full of astounding, though implausible, details. And so, in order to understand what really took place in the mind of séance sitters, and to show how easy it is to fool people on such occasions, we decided to organize a little experiment. Bill had been a good friend of deceased writer and historian Fletcher Pratt and, with the aid of his wife, Inga I think, we organized a séance at her house in Atlantic Highlands, New Jersey. Eleven 'sitters,' varied ages and professions, were invited. I was going to perform the role of the medium, though they knew I was actually a magician. We sat around a table, lights were lowered and only a dark red light remained on. I remember I did an Al Baker self-cutting-deck trick, a floating and ringing bell, and many other wonders. My final coup de théâtre had everyone gasping: they could see my figure in the dim red light sitting at the table, and a moment later I started to levitate, with chair and everything, until I reached almost two meters in height. After this, the sitters were told to retire to their rooms and write out what had occurred, so their accounts could be compared. You can't believe how many inaccuracies of recall were present in their reports. . . ."

Randi also told me how he accomplished his levitation. "Well, Alan, a weightlifter friend of mine, was all dressed in black and he crept inside the room when the séance started. With red light on he was virtually invisible and, at the moment I needed to levitate, he put the chair I was sitting in on his shoulders and lifted me!"

Home's Mouth Organ

As for D.D. Home, Gresham stated that he had spent "a good many years . . .



digging into the life and times, triumphs and despairs, of a man who is generally conceded to be one of the greatest enigmas of history" (Gresham 1960). While in England to see his sons, who had remained in the care of C. S. Lewis after Joy's death, he visited the Society for Psychical Research in London to research Home.

Upon returning to America, he immediately told Randi that he had discovered a small harmonica among Home's effects held at the SPR. Since such a harmonica can be played when put inside one's mouth, without the use of the hands, Gresham's hypothesis was that Home could have used it to simulate the famous sound of the accordion being played by the spirits in the dark.

"He was very excited about the discovery," says Randi, "as well as over the discovery of a number of white gloves in the SPR/Home collection. His idea was that Home wore white gloves and as part of his routine used a fake forearm that also wore a glove. As I remember, he told me that he had found more than one of the one-octave mouth organs and had discussed the implications with someone at the SPR at the time."

However, after a recent search of the Home collection at the SPR, neither gloves nor mouth organs could be found (Gauld and West 1997).

"Is it possible that these were removed from the collection?" Randi wonders. "Of course, I only have Bill's account to go by, but I recall that he was very excited, and was looking into accounts of what tunes had been heard at the séances, to see if they could be played in one octave. Bill also had many other observations on possible scenarios for Home's tricks. He pointed out that the 'full light' of a Victorian living room was a few gas-lights, not at all what we would consider 'bright' by modern standards."

Unfortunately for us, nothing of Gresham's work on either Margery or Home remains. "I tried to find and get the material he'd prepared," said Randi, "but Renée moved away almost immediately, and I could never find her again. Pity."

I was only able to track down one article he wrote for a psi magazine on what he considered to be Home's reasons for

becoming a charlatan. His attitude toward the medium is quite sympathetic: "We never know what burdens another person bears. Nor do we read the weather map of the soul and the storms that sweep across it. In short, we cannot honestly condemn anyone for anything."

diagnosed with cancer of the tongue he decided he had had enough. On September 14, 1962, he registered into the rundown Dixie Hotel room as "Asa Kimball, of Baltimore" and took his life with an overdose of sleeping pills.

"I thought his suicide was justified"

**Gresham told a fellow veteran from Spain:
"I sometimes think that if I have any real talent it
is not literary but is a sheer talent for survival."**



End of the Alley

Reflecting on his life, Gresham told a fellow veteran from Spain: "I sometimes think that if I have any real talent it is not literary but is a sheer talent for survival. I have survived three busted marriages, losing my boys, war, tuberculosis, Marxism, alcoholism, neurosis, and years of freelance writing. Just too mean and ornery to kill, I guess" (quoted in Duncan 2000).

In 1962 his last book was published: *The Book of Strength: Body Building the Safe, Correct Way*. He was becoming blind, however, and when he was

comments Randi. "He was terminal, did the only sensible thing. Living on another year or so would have been under drugs, and would have broken his family financially. One reason he gave me for his suicide was that he didn't want to be a weak figure representing Alcoholics Anonymous." Sadly, the only tribute paid to him in the *New York Times* came from the bridge columnist.

Note

I would be very grateful to any reader who could provide me with a copy of any article (or reference of it), on any subject, written by W.L. Gresham.

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Legend of the Lake Champlain Monster

Termed “North America’s Loch Ness Monster” and known affectionately as “Champ,” the legendary Lake Champlain Monster reportedly haunts the waters of its namesake. Lake Champlain began roughly 10,000 years ago when an estuary of the Atlantic Ocean, the Champlain Sea, was transformed by receding glaciers into an inland, freshwater body (Zarzynski 1984). This lake—and some say the creature too—was “discovered” in 1609 by Samuel de Champlain. Since then, the 125-mile-long lake, situated between New York and Vermont (with six miles extending into Québec), has received much attention. In 1873 and 1887, showman P. T. Barnum offered huge rewards for the monster—dead or alive (Zarzynski 1984, 83). More recently, there has been much “cryptozoological” interest and the development of a burgeoning Champ industry.

Proliferating sightings, “theories” of self-styled monster hunters, and even a Holy-Grail photo of the supposed beast have spawned innumerable newspaper and magazine articles, books, entries in paranormal compendia, and radio and television segments, not to mention keychains, mugs, T-shirts, and

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other offspring, including “Champburgers” (seafood patties on sesame-seed buns). Such endeavors have made

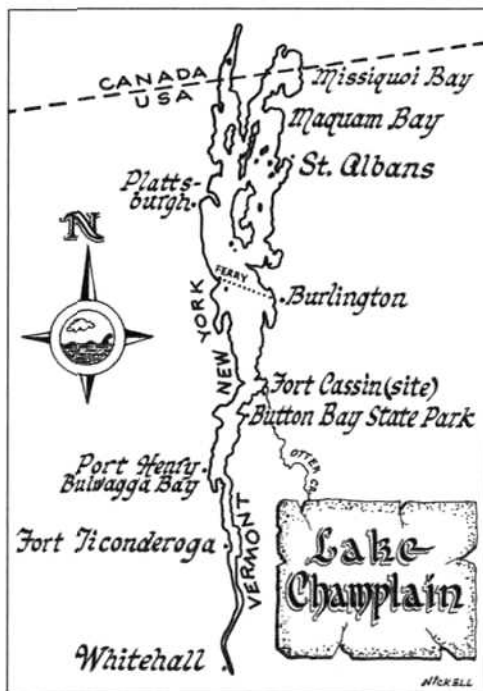


Figure 1. Map of Lake Champlain, showing selected sites.

Champ the best-known lake monster in the United States and, except for British Columbia’s “Ogopogo,” in all of North America. “Few cryptozoologists deny the possibility of Champ’s existence,” states W. Haden Blackman in his *The Field Guide to North American Monsters* (1998), “and many openly accept the creature,” believing it to be a plesiosaur, zeuglodon, or other unknown or erst-

while extinct creature. Champ seeker Joseph Zarzynski has even given it a name: *Beluaaquatica champlainiensis* (“huge water creature of Lake Champlain”) (Owen 1982).

To assess the reputed phenomenon, SKEPTICAL INQUIRER managing editor Ben Radford and I launched “The ‘Champ’ Expedition” in the summer of 2002. We examined all aspects of the Champ legend, from its alleged inception, through the impact of a famous 1977 photograph of the creature, and beyond. Unlike some so-called investigations—which, while long-running, were largely attempts to collect sighting reports—we believe ours was the most wide-ranging, hands-on investigation of Champ ever conducted with an intent to solve, rather than promote, the mystery.

Champ Expedition

Our investigation was multi-faceted. I made an advance trip (August 2–4, 2002) to take in the annual Champ Day celebration (August 3) in Port Henry, New York, interview various people, buy books, and, in general, scout resources and make plans for our subsequent two-man expedition, August 22–26.

In the interim we began to study the myriad articles and books on Champ and other alleged lake monsters. Ben did extensive work to ready experiments regarding the famous 1977 Champ photo by Sandra Mansi, while I located

her by phone, arranged for an interview, and (from photo expert Rob McElroy) borrowed a vintage camera like the one Mansi had used. We discussed options, drafted itineraries, obtained and readied gear, and made other preparations.

With my car fully loaded, we set out for Whitehall, New York. There we met friend and fellow skeptic Robert Bartholomew and his brother Paul (who is a cryptozoologist), and discussed many relevant issues with them. Then we began to explore Lake Champlain from its southernmost tip near Whitehall to its northern end in Québec (see map, figure 1). Our "base camp" for the next two days was Collins Cabins at Port Henry. Late the first afternoon we set up "Champ Camp I" at a boating ramp area just outside Bulwagga Bay (figure 2), the locale of a majority of Champ reports, and maintained a watch from 7 to 8:30 P.M.—a supposedly prime time for Champ sightings (Kojo 1991). Unfortunately Champ was a no-show.

We later conducted research at the Collins Cabins' bar—seriously! With Ben taking notes, I inquired of a group of men about a local signboard that lists Bulwagga Bay "Champ Sightings," six columns of names and dates (see figure 3). One man, William "Pete" Tromblee, quipped that it was "a list of the local drinkers." In fact Tromblee's own 1981 sighting is listed, although he assured us he was entirely sober at the time. He did admit that he did not know *what* he saw and volunteered that it might have been a large sturgeon—a refrain one hears quite often. The proprietor, Mrs. Rita Collins, rummaged through a drawer behind the bar and came up with some related newspaper clippings, including one with a photo of a "six-foot piece of driftwood that bears a striking resemblance to artists' conceptions of Lake Champlain's legendary monster, Champ."

The following day (August 24) we crossed the Champlain Bridge to Vermont. We explored the lake shore around Otter Creek, dropped in on the naturalist at Button Bay State Park, and then proceeded to Bristol to keep our appointment with Sandra Mansi regarding her famous snapshot of—well, that



Figure 2. Benjamin Radford maintaining a Champ vigil.



Figure 3. Champ monster sighting board at Port Henry, New York, the "Home of Champ."

is the question Ben addresses in his article elsewhere in this issue.

We subsequently rendezvoused with Norm St. Pierre, a veteran fisherman and lake guide who operates Norm's Bait and Tackle at Crown Point, New York (a few miles south of Port Henry). Outside this "One Stop Hunting and Fishing Supply Store" rests a giant hook, baited with a large rubber fish and waggishly labeled "Norm's Champ Rig." Norm was to be our guide, aboard his sonar-equipped Starcraft cruiser, to a major area of Champ's reputed lair.

The sonar (figure 4), which Norm uses to locate schools of fish, soon picked up a 12- to 20-pound catfish or

sheephead. However, on our entire tour of Bulwagga Bay and many miles beyond, we saw nothing, either visually or on sonar, that could be construed as Champ (with the exception of the "monster" in figure 5). That is not surprising, given that during more than four decades on the water he has *never seen* a giant unknown lake creature. He says he *has* occasionally encountered a wake on calm water that puzzled him, and, like others, will say there's "something" out there. But he is more likely to suggest a sturgeon than a plesiosaur. (More on all these matters presently.)

Early in the morning we closed out our base at Port Henry and, again crossing



Figure 4. Norm St. Pierre, veteran fishing guide, aboard his sonar-equipped boat.

into Vermont, made our way to St. Albans and beyond. We searched the areas of Maquam and Missiquoi Bays (again see map) in hopes of finding a landscape that could match the location of the Mansi sighting. Unfortunately her description of the location was so vague as to be almost useless, and the intervening years had perhaps changed the scene completely. This precluded one set of photographic experiments but we located a suitable area for others, near a boat launch. By wading into the water Ben discovered that it was surprisingly shallow for more than 150 feet offshore. This was fortuitous since we could avoid having to use our raft, but it raised an interesting point. A local man who had resided there for thirty years said that the general shallowness of the lake in the surrounding area made him doubt the presence of any leviathan there. Indeed, while the lake reaches depths of up to 400 feet, the maximum for all of Missiquoi Bay is fourteen feet. And for the eastern edge of Maquam Bay and the connecting area of lake, the offshore depth at Mansi's estimated sighting distance of 150 feet is twelve feet or less, as shown by a Lake Champlain hydrographic contour map (Lake n.d.).

The experimental work was time-consuming, but we were through by mid afternoon and continued north to the upper end of Lake Champlain at Venise Bay, Quebec. We stopped along

the way to explore and to photograph some driftwood that had piled up along the shore. We returned as far south as Burlington, Vermont, that night. Ben was glad to finally be able to wash up from his swim in Lake Champlain and to treat a cut foot—injured on sharp rocks during the earlier experiments.

Our final day, the 26th, was another long one. We took the ferry *Valcour* from Burlington to Port Kent, New York, traversing Lake Champlain at one of its widest places. We maintained a Champ watch, noting that some reported sightings had been made from ferries as well as other boats. A veteran deckhand told us he teased children to look overboard for Champ and instructed adults to “go below” to the on-board snack bar that serves beer and wine so they might also be able to see the creature.

Disembarking from the *Valcour*, we headed south along the west coast of Lake Champlain until we veered away on the interstate and headed for home. We had traveled over twelve hundred miles, and had obtained quantities of notes, photographs, videotapes, books, charts, and other research materials—all of which would now need careful study. Here are our findings.

Sightings

Promoters of Champ's existence cite a major eyewitness. According to *Discover*

magazine (Teresi 1998), “The first recorded sighting of Champ dates back to July 1609, when Samuel de Champlain claimed he saw a ‘20-foot serpent thick as a barrel, and a head like a horse.’” This quotation from Champlain—which has been repeated, paraphrased, and embellished with Indian legends (e.g., Coleman 1983; Green 1999)—is, alas, bogus. Jerome Clark (who was once taken in by the claim [1983]) reports it “traceable to an article by the late Marjorie L. Porter in the Summer 1970 issue of *Vermont Life*” (Clark 1993).

Champlain's actual description is in volume 2, chapter IX, of his journal (quoted in Meurger 1988):

. . . [T]here is also a great abundance of many species of fish. Amongst others there is one called by the natives *Chaousarou*, which is of various lengths; but the largest of them, as these tribes have told me, are from eight to ten feet long. I have seen some five feet long, which were as big as my thigh, and had a head as large as my two fists, with a snout two feet and a half long, and a double row of very sharp, dangerous teeth. Its body has a good deal the shape of the pike; but it is protected by scales of a silvery gray colour and so strong that a dagger could not pierce them.

As Champlain's actual account demonstrates, far from heralding a serpentine, horse-headed monster, he simply mentions a native species of large fish. It was almost certainly a gar (or garfish), one of the *Ganoidei* subclass (from the Greek *ganos*, “shiny”), which includes sturgeons and other varieties.

Supposed other evidence of an early Champ sighting comes from an old powderhorn bearing a Crown Point soldier's name, the year 1760 and various pictorial elements, including “a rather large dragon-like creature.” Zarzynski (1984, 52–53) suspects this is a “possible link” to Champ. However, the figure is merely a stereotypical dragon—complete with large wings. It is by no means evidence for the existence of a Lake Champlain leviathan.

In his *Champ: Beyond the Legend*, Zarzynski (1984, 152–205) catalogued 224 “Champ” reports. Putting aside Samuel de

Champlain's, which never occurred, the rest are from the nineteenth and twentieth centuries. The earliest is from 1819 and is still the most sensational description of Champ ever recorded. I tracked down the original account in the *Plattsburgh Republican* of Saturday, July 24.

The sighting was attributed to a "Capt. Crum" who was in a scow on Bulwagga Bay the previous Thursday morning. The black monster was said to be about 187 feet long with its flat head—resembling that of a "sea-horse"—rearing more than fifteen feet out of the water. The creature was some two hundred yards away (twice the length of a football field) and was traveling "with the utmost velocity" while being chased by "two large Sturgeon and a Bill-fish." Nevertheless, the captain was able to notice that it had three teeth, large eyes the color of "a pealed [*sic*] onion," a white star on its forehead, and "a belt of red around the neck." The incident has an outlandishness about it that suggests someone was pulling the reader's leg.

Hoax or not, *that* monster has not been seen since, or has apparently shrunk to a fraction of its former self and lost its distinctive markings, although not without gaining others. Anyway, according to the various reports Champ is between ten and 187 feet long, has one to four or more humps or up to five arching coils, and is black, or has a dark head and white body, or is gray, or black and gray, or brown, moss green, reddish bronze, or other colors, possibly being drab or shiny, scaly or smooth—even "slimy."

Moreover, it possesses fins, or a pair of horns, or "moose-like antlers," or "elephant ears," or a tan or red mane, or glowing eyes, or "jaws like an alligator"—or again had none of these. Overall it looked like a great snake, "a large Newfoundland dog," "a steam yacht" (although traveling too fast to be one), a horse, a Florida manatee, a submarine periscope, a whale, etc., etc. (Zarzyński 1984, 152–205).

Astonishingly, some writers have concluded that there is a "surprising degree of correlation between all the various descriptions" (Grant 1992, 115), that they are indeed "disturbingly similar"

(Vachon 1977). However, to the rest of us it appears that either Champ is a metamorphosing, contortionistic, chameleonesque creature, completely unknown to the natural world, or else eyewitnesses are viewing—and no doubt misperceiving—a number of different things.

Many of the sightings were from considerable distances—often a hundred yards or more, a few at between a quarter and three-quarters of a mile, four at one mile, and at least one at two miles away, although often the distance was unreported. (A dozen observations were made by the use of spyglasses or binoculars.) Since the apparent size of the creature depends on how far away it is, then mistaking either the distance or size will result in misjudging the other accordingly. If we consider other factors—such as surprise, poor visibility on several occasions (such as nighttime sightings and viewing the creature while it was entirely underwater), and other problems, including the power of suggestion—the sightings could obviously be fraught with error.

"Expectant Attention"

One should not underestimate the power of what Rupert T. Gould, in his *The Loch Ness Monster and Others* (1976, 112–113), called "expectant attention." This is the tendency of people who, expecting to see something, are misled by anything having some resemblance to it. For example, a log may be mistaken for a lake serpent under the right conditions, especially in an area where reports of such a creature are common. Indeed, logs have actually been mistaken for the Loch Ness Monster. Gould (1976, 107) describes two instances of his own knowledge in which "a pair of binoculars resolved an apparent 'monster' into a floating tree-trunk" at the Loch.

Perhaps certain Lake Champlain monster sightings can be so explained. One from circa 1886, for instance, said the monster looked "like a long log or pole," while a 1954 report described the creature as "like a telephone pole in appearance." Photos of "monster"-shaped driftwood at Lake Champlain have been published (Zarzyński 1984, 99, 163, 171; "Champ unmasked" n.d.).

In this regard, local fisherman Tom Forrest told an illuminating story. In 1998 he was with a group of people who saw "Champ," and some were frightened. In time, however, it turned out to be a partially waterlogged tree trunk, bobbing and propelled by the current. It was nearly forty feet long with a root that resembled a monster's head (Forrest 2002).

A particular feature of Lake Champlain—an effect called a seiche—may help to produce just such sightings. A seiche is a great underwater wave that sloshes back and forth, even though the lake's surface appears smooth. The sloshing may dislodge debris from the bottom—logs or clumps of vegetation, for example—that bob to the surface as "monsters" (Teresi 1998).

Another likely candidate for some Champ sightings is a large fish. Samuel de Champlain's *Chaousarou*—clearly a gar—is an obvious possibility. Tom Forrest has caught very large gar. When I spoke with him he had only days before witnessed a friend hook a Longnose Gar that—Forrest insists—was "monster" sized; it measured approximately 6 feet 4 inches long and weighed some 40–50 pounds. He calls this "the real Champ" and has dubbed it, appropriately, "Gargantua" (Forrest 2002).

Among other large fish in the lake are sturgeon which are now endangered. They are generally in the five-to-six-foot range but can grow to twice that size (Zarzyński 1984, 98–100; Meurger 1988, 47–48). In fact, one couple who saw a 6-foot creature in 1949 described it as possibly a large sturgeon. While a sturgeon's length is insufficient to account for some other Champ sightings, the size may easily be overestimated.

Multiple fish can appear as a single monster. On July 7, 1988, Walter and Sandi Tappan saw several creatures and videotaped one "series of small humps" they believe was a large creature. The video was included on a September 23, 1992, episode of NBC's *Unsolved Mysteries*. Even monster enthusiast John Kirk (1998, 135–136), who acknowledges that the Tappans claimed to see the monster's head and neck, believes the video shows "fish feeding near the surface."

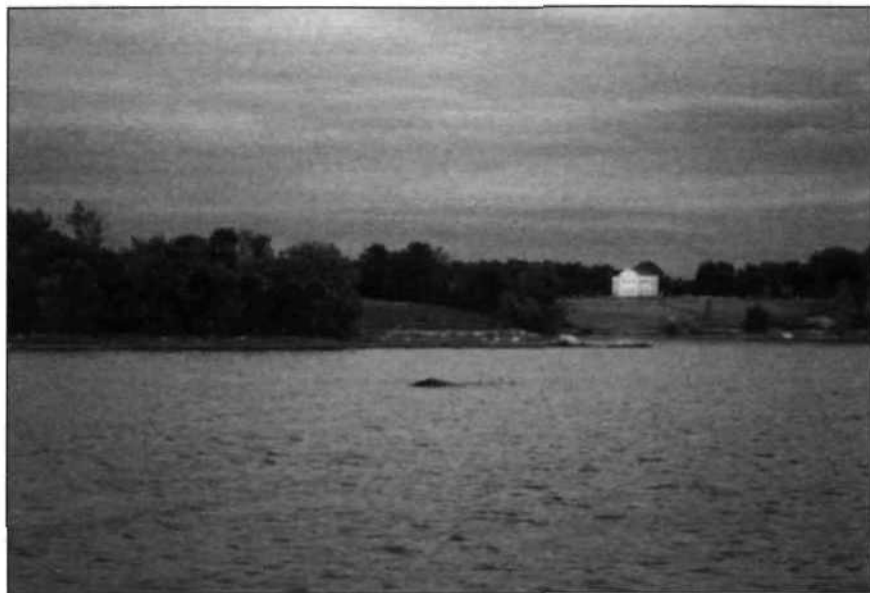


Figure 5. Monster or rock? You decide!

Ronald Binns (1988, 205–207) tells of a young man who spied a 50-foot sea serpent off England's Brighton beach in 1857; in later years, after he became a marine biologist, he realized he had actually seen several dolphins "swimming in line." In this manner, two or more large gar, sturgeon, or other fish could easily appear as a single multi-humped monster, accounting for numerous such sightings at Lake Champlain.

Otters, which are playful and enjoy "chasing each other" and "following the leader" (Godin 1983) are especially prone to creating this illusion and in general being mistaken for lake monsters, as I discovered in investigating other cases. For example, Jon Kopp, a Senior Wildlife Technician with New York's Department of Environmental Conservation, told me of a personal encounter when he was in a duck blind on a lake in Clinton County. It was dark, when suddenly, heading toward him was a huge snakelike creature making a sinuous, undulating movement. However, as it came closer, Kopp realized that the "serpent" was actually six or seven otters, swimming single file and diving and resurfacing to create the serpentine effect. "After seeing this," Kopp told me, "I can understand how people can see a 'sea serpent'" (Nickell 2001, 102).

Otters have been mistaken for monsters elsewhere, including Loch Arkaig and Loch Ness in Scotland (Binns 1984, 186–191) and, I believe, Lake Utopia in

New Brunswick, Canada, and Silver Lake in Wyoming County, New York (Nickell 2001, 133–135, 92–103), as well as many other lakes. The Northern River Otter (*Lutra canadensis*) measures up to 52 inches long, and is dark brown with a lighter, grayish throat and belly but "looks black when wet" (Whitaker 1996). While treading water with its hind paws, it can extend its head and long neck out of the water, inviting comparisons with the extinct plesiosaur, which is so often mentioned as a possibility for "Nessie" and "Champ" (Binns 1984, 186–191).

In light of otters, consider this Champ report. On June 15, 1983, several witnesses saw a 30- to 40-foot creature with four humps in Lake Champlain off the site of Fort Cassin. However, as one admitted to the Lake Champlain Phenomena Investigation (Zarzynski 1983), "It could have been one large creature or four smaller ones"—a concession that takes on new significance when we learn that this site was at the "mouth of the Otter Creek." (Although it is actually Vermont's longest river, it is otherwise aptly named as a habitat for the Northern River Otter.)

A few miles away, Button Bay State Park Naturalist Laura Hollowell showed me a drawing made by a young girl who had seen a "baby Champ." Hollowell (2002) believes this and other such infant-monster sightings may well be otters. She told me she believes "People

have seen otters and mink swimming in the lake and think they've seen Champ." She said she is "surprised at what unreliable reporters people can be in terms of wildlife sightings," adding, "I don't believe that there are any large, unidentified animals in Lake Champlain."

Keeping in mind eyewitness descriptions of Champ with horns, "moose-like antlers," or a head "like a horse" (Zarzynski 1984, 161, 165, 177), one cannot help but acknowledge other wildlife possibilities. Allowing for overestimation of length—which is especially easy to do if there is a wake—swimming deer come readily to mind. Even some believers among Loch Ness monster hunters considered this the probable explanation for "horned monster" reports in their bailiwick. Indeed, when one photo of Nessie was enlarged, "she" was revealed to be a deer (Binns 45, 191–193).

Still other possibilities for Champ (and many purported lake monsters elsewhere) include wind slicks and boat wakes. A deckhand on the *Valcour* ferry (out of Burlington, Vermont) told us that Champ reports had declined in the last fifteen years or so with the cessation of large traffic on the lake. A barge's wake often traveled across the lake, he said, mystifying anyone who might encounter it without seeing its cause. Thus some people could infer, or imagine having glimpsed, the fabled lake creature (Valcour 2002).

In other sightings and photographs, additional culprits—including other swimming animals and marine creatures, long-necked birds, even rocks (see figure 5)—may also pose as a lake monster, along with toy models and manipulated images (Binns 1984; Nickell 1994). Considering all such factors, there seems no compelling reason to postulate the existence of a hitherto unknown creature in Lake Champlain.

Bandwagon Effect

I did an analysis of the 224 sightings listed by Zarzynski (1984, 152–205) (less the nonexistent 1609 sighting and nine completely undated reports). Interestingly, during the entire period before 1860 there was only a single

recorded sighting which, as I have indicated, was probably a spoof. After that, recorded sightings increased in the 1870s and 1880s (to fifteen and twenty-three respectively), then declined again before shooting up steadily in the 1960s (fifteen), 1970s (fifty-nine), and 1980s (seventy until mid-1984). The reason for the fluctuations is uncertain, but if there were several large leviathans in the lake prior to 1860 as proponents believe, why was there only one highly doubtful sighting? Why did not the Native Americans know about the creatures, and tell Samuel de Champlain about them rather than the comparatively mundane *chaousarou* (garfish)?

As to the modern rise in sightings (which is obviously much greater than a mere growth in population), that may well be due to heightened expectancy caused by an increase in articles, books, and other media reports on the subject. Loren Coleman (1983, 89) gives some credit to "the arrival on the scene" of Joseph Zarzynski, who gave those who had previously been ridiculed "a sympathetic ear." That seems only fair, but Zarzynski's and others' excessive credulity may have tipped the scales in the opposite direction, resulting in a still greater expectancy and thus helping to create something of a bandwagon effect.

This seems supported by the tendency of the reported imagery to subtly conform to the concept of the day. For example, the term "sea serpent" was used in several nineteenth-century accounts but was effectively dropped afterwards (except for a single journalist's use). The most prevalent descriptor overall was "huge snake" (or similar wording), but in modern times (after 1978) reports occasionally likened the creature to a "dinosaur" (Zarzynski 1984, 152-205). This probably reflects the popular notion—after the widely circulated 1934 hoaxed photo of the Loch Ness Monster (Nickell 1994, 171; 1996)—that such mythical beasts resemble plesiosaurs. Michel Meurger, in his *Lake Monster Traditions: A Cross-Cultural Analysis* (1988, 39), concludes that "... Champ's modern fame is the product of local monster-enthusiasts in their efforts to promote their own legend along Lochnessian lines."

Evaluation

Not only is there not a single piece of convincing evidence for Champ's existence, but there are many reasons *against* it, one of which is that a single monster can neither live for centuries nor reproduce itself. There would need to be several in a breeding herd for the species to have continued to reproduce over time ("Myth" 1972).

Zarzynski (1998) acknowledges this, theorizing that a colony of thirty or fewer plesiosaurs have inhabited Lake Champlain since its formation some 10,000 years ago. However, with so few individuals he worries that Champ is near extinction. Fellow monster hunter Dennis Jay Hall (2000, 15), on the other hand, insists: "There is a healthy population of these animals living in Lake Champlain. They are here for a reason; this is their chosen home."

But then where is a floating or beached carcass or other certain trace of the fabled creature? Although there are possible reasons why a Champ carcass might be rare (for example, most deaths could occur in winter, when the lake largely or completely freezes over [Zug 1981]), there is no question about the existence of sturgeon, gar, otters, and other Champ look-alikes. The *absence* of a Champ carcass "does not support the existence of such creatures either," according to the Smithsonian's Dr. George Zug (1981). And where are the bones that, as Gould (1976, 120) asked of Loch Ness, should have eventually covered the entire lake floor?

The burden of proof, of course, is on the claimants. Far from meeting that burden, however, the Champ defenders are instead promoting a mystery and—like so many paranormalists—are thereby engaging in a logical fallacy called arguing from ignorance: "We don't know what these people saw; therefore, it must have been Champ." One cannot draw a conclusion from a lack of knowledge, and so, until an actual specimen presents itself, the possibility that any large, unknown animal inhabits Lake Champlain remains somewhere between extraordinarily slim and none.

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The Measure of a Monster

Investigating the Champ Photo

The most famous photograph of a monster in Lake Champlain was taken in 1977. The photo sparked the modern age of Champ investigations and renewed national interest in the creature. Recent field experiments, however, reveal that the "creature's" size is less than monstrous and the main eyewitness is mistaken.

BENJAMIN RADFORD

Lake Champlain forms the border between Vermont and New York, stretching down from Canada at its northernmost point south to Whitehall, New York. It is also, many people believe, home to America's version of the Loch Ness monster. "Champ," as the creature is called, has allegedly been seen by hundreds of witnesses. The lake (and therefore the monster) is named for explorer Samuel de Champlain, who is often—but erroneously—said to have been the first to report the creature. Sought after by P.T. Barnum, featured on *Unsolved Mysteries*, and "officially" protected by both the New York State Assembly and the Vermont Legislature, Champ remains a modern mystery. A big part of that mystery lies not only in the cold waters of

the lake but also in a small photograph taken by a woman named Sandra Mansi.

Mansi's account of her family's 1977 encounter with Champ is the most complete and fully documented of any lake monster sighting in history. With the most famous photo of the Loch Ness monster (the "surgeon's photo") revealed in 1993 to be a hoax, the Mansi photo stands alone as the most credible and important photographic evidence for a lake monster in Champlain—or anywhere else. John Kirk, in his book *In the Domain of the Lake Monsters*, writes that "The monster of Lake Champlain . . . has the distinction of being the only lake monster of whom there is a reasonably clear photograph. It . . . is extremely good evidence of an unidentified lake-dwelling animal" (Kirk 1998, 133). Joe Zarzynski, author of *Champ: Beyond the Legend* (1984), calls the photo "the best single piece of evidence on Champ." Another writer says that "By any standard the Mansi photograph remains a genuine mystery and a serious obstacle to any effort to reduce the Champ phenomenon to mundane causes" (Clark 1993, 67).

Despite its notoriety, and inclusion in most books of cryptozoology ("hidden animals"), there has been little skeptical investigation of the monster since the early 1980s. In July 2002, the twenty-fifth anniversary of the Mansi photograph, Senior Research Fellow Joe Nickell and I undertook an extensive investigation of this mysterious monster. His overview of Champ and our search begins on page 18.

Eyewitness Accounts

Like Bigfoot and the Loch Ness monster, most of the evidence for Champ's existence rests on eyewitness testimony. As I have noted elsewhere (Radford 2002), such accounts are notoriously unreliable and a poor substitute for hard evidence. One writer (Rabbit 2000) listed over a dozen factors that can reduce the accuracy of such accounts, including observer's fear and stress; poor observation conditions; slippage of memory; seeing what the observer wants or expects to see; changing details to conform to other witnesses' accounts; reluctance to admit ignorance; filling in nonexistent details, and so on.

Lake creature sightings are complicated by the fact that it is very difficult to judge distances and sizes on bodies of water. As Paul LeBlond of the University of British Columbia's Department of Oceanography points out, "A problem which commonly arises in the interpretation of unfamiliar objects on water is that of determining their size. In the absence of nearby reference features, the eye cannot estimate absolute dimensions reliably" (LeBlond 1982). On land, the human eye and brain can judge spatial dimensions fairly well, comparing an object to a nearby tree, home, or other structure. An unfamiliar object against a visual field such as sky or water, however, can produce



Figure 1: The object Sandra Mansi photographed at Lake Champlain. ©Gamma Liaison/Sandra Mansi

wildly inaccurate estimates of size and distance.

People often see what they want—or expect—to see. In the case of Champ, the monster's likeness and legend are well-known in the area, and the knowledge that a monster is said to reside in the lake could easily transform an unusual sighting of "something in the water" into a Champ sighting.

The Mansi Encounter

Eyewitness sightings of Champ are relatively rare, and sightings accompanied by good photographs are even rarer. The Mansi family had the remarkable fortune to not only get a good long look at the creature but also photograph it (see figure 1).

According to Sandra Mansi, her family's encounter with Champ took place on Tuesday, July 5, 1977. Sandra and her fiancé Anthony Mansi, along with Sandra's two children from her previous marriage, were taking a leisurely drive along Lake Champlain. They drove by some farmland and, around noon, made their way to a small bluff overlooking the lake. The two children went down to the water while Anthony returned to their car to get a camera. As Sandra watched her children and the lake, she noticed a disturbance in the water about 150 feet away. She thought at first it was a school of fish, then possibly a scuba diver. "Then the head and neck broke the surface of the water. Then I saw the head come up, then the neck, then the back" (Mansi 2002).

Mansi did not panic: "I wasn't even scared, I'm just trying to figure out what I'm seeing. Then when Tony came over the field he saw it and started screaming, 'Get the kids out of the water!'" The kids scrambled up the bank and headed toward the car. As Anthony helped Sandra up the bank, he handed her the camera. She knelt down, snapped one photo, and then put the camera

Benjamin Radford wrote about Bigfoot in the March/April 2002 issue of SKEPTICAL INQUIRER. His book Media Mythmakers: How Journalists, Activists, and Advertisers Mislead Us will be published in July.

down to watch the creature. The head and neck turned slightly, then slowly sank into the water and disappeared.

The Mansi estimated that the creature's neck stuck about six feet out of the water and the whole object was about twelve to fifteen feet long. The sighting lasted a remarkably long time—between four and seven minutes—during which time the creature never turned to face the shore. Sandra Mansi described the neck and head as dark in color and said that what we see in the photograph is as much of the creature as she saw.

Despite the substantial weight and credibility given to it by Champ researchers, the Mansi photograph by itself is intriguing but holds almost no value as evidence. There is little usable information revealed in the photograph; whether by accident or design, virtually all of the information needed to determine the photograph's authenticity (and subject matter) is missing, lost, or unavailable. For example, Mansi cannot provide the negative, which might show evidence of tampering (she said she habitually threw away her negatives). She also can't provide other photographs taken on the roll (which might show other angles of the same object, or perhaps "test" photos of a known object from an odd position). Mansi claims to be unable to locate the site of the photo, which would help to determine a number of things, including the size of the object. Furthermore, the photo has virtually no objects of known scale (boat, human, etc.) by which to judge the creature's size or the distance. The fact that the Mansi, allegedly afraid of ridicule, waited four years to release the photo was also seen as suspicious. All we are left with is a fantastic story whose only supporting proof is a compelling but ambiguous photograph of *something* in the water.

The Hoaxing Question

Because of the litany of missing information (and the relatively high quality of the image), suspicions of a hoax surfaced almost as quickly as Champ. Such accusations were summarily dismissed by Mansi family lawyer Alan Neigher, who said that they "could no more have constructed such a hoax than put a satellite in orbit."

Richard D. Smith, a filmmaker who was producing a documentary on Champ, offered his expert commentary on the matter of a hoax: "As a photographer and filmmaker, I can speak with some authority as to what it would take to fake a picture of this sort. Assuming the remote possibility that the Mansi photo is a fraud, it would require fabrication of an excellent, full-sized model (highly expensive in terms of expertise and materials) which would have to be smuggled out to Champlain or another lake, there assembled or inflated, and successfully maneuvered around out in the water (most difficult, especially with a slight wind blowing), the whole thing accomplished without being seen or the slightest leak in security (unlikely)" (Smith 1984).

This account is nearly comical in its strained assumptions. Smith envisions an "excellent, full-sized model" of the Champ monster, which certainly is unlikely. But the Mansi photograph doesn't show an "excellent, full-sized model" of Champ; it simply shows a dark, featureless, ambiguous curved form of

unknown size in water. Surely such an object would not be as difficult to fake as Smith presumes.

However far-fetched some of the hoax dismissals are, I believe they are fundamentally correct. After an exhaustive and detailed review of both her account and photograph, I am willing to grant that she is probably a sincere eyewitness reporting essentially what she saw. Assuming that both the account and photo are truthful (though error-prone) records of something in the water, what can we conclude about it? Several examinations have been done.

The Frieden Analysis

In 1981, B. Roy Frieden, of the Optical Sciences Center at the University of Arizona, examined the photograph at the behest of Champ researcher Joe Zarzynski. Frieden's findings were published in Zarzynski's book as Appendix 2.

Frieden believes the picture to be a valid print, and finds no evidence of photographic tampering. He does find a "suspicious detail" in the picture: "When I showed it to a woman who formerly lived at Lake Champlain, she immediately noticed a brownish streak going horizontally from left to right across the picture right up to the object in question. She right out said that it looked to her like a sand bar" (Frieden 1981). Frieden believes that the streak is "a real detail in the picture," and suggests that if it is a sand bar, "then there is a distinct possibility that the object was put there by someone . . . the sand bar problem really has to be investigated."

The LeBlond Analysis

Another analysis was conducted by Paul H. LeBlond of the Department of Oceanography at the University of British Columbia. LeBlond (1982) attempted to use the general appearance of the water's surface to estimate the length of the waves, and in turn use *that* as a scale by which to measure the object in the photograph. After a list of the many possible sources of error, LeBlond summed up: "The inescapable conclusion [despite all the unknowns] is that the object seen in the Mansi photograph is of considerable size" (he estimated between sixteen and fifty-six feet long).

LeBlond used a complex formula involving wind speed, fetch, wave period, and wave height—all of which were estimated. LeBlond did his best with what scant information he had to work with, but no matter how good the math or model is, with so many estimated variables it is apparent that any result will be little better than a wild guess. LeBlond's analysis, by his own admission, was fraught with many unknowns: "Sources of error may appear at many stages of the estimation method, and this must be kept in mind when interpreting the results."

Most writers who mention the LeBlond analysis fail to include this important caveat, instead portraying his results as conclusive and scientifically sound. One writer, John Kirk, goes so far as to say that LeBlond's heavily qualified conclusions "destroyed the learned academic's [i.e., Frieden's] hypothesis that the animal could have been a fake" (Kirk 1998, 135).

Other cryptozoologists, it should be noted, were more cautious about the results. J. Richard Greenwell, of the

International Society of Cryptozoology, discussed the various analyses and their conclusions that "there are 'definitely no cuts, no superimposition,' but, he warn[ed], that 'does not mean it is a monster or a living object. It does mean an object was there and was photographed'" (Greenwell 1981).

There is one area where LeBlond's discussion is clearly wrong. He mentions the efforts to locate the Mansi site, and provides a map with a shaded area showing "stretches of shoreline from which the Mansi photograph may have been taken." The areas highlighted are on the western shores of Hog Island and below Maquam Bay across from Hero Island. Yet only someone who had never been to the area could suggest these sites as possible candidates; in that area, the far (eastern) shores are much too far away to possibly be depicted in the Mansi photograph.

The Radford Analysis

In my own analysis of the Mansi photograph, an odd thing about the subject emerged. It is not apparent at first glance, but the "head" and "hump" are not clearly connected. If the photograph truly does depict the hump and neck of a lake monster, the actual body contortion is very unusual and unlikely for nearly any type of living animal. To see why, notice that the neck portion does not align with the hump. The neck in fact emerges out of the water from the left side of the photograph, *away* from the hump (and supposed body; see figure 2).

The reason that the head and hump seem connected is that there is a dark patch in the water between the two. I suggest this is in fact a shadow from the head. In the photograph, that area is not nearly as dark as the head and hump, and has all the characteristics of a shadow. Furthermore, Mansi's own account corroborates the shadow hypothesis: She claims that the photo was taken around noon. If this is true, then the sun should be directly above, hitting the top of the head and casting a shadow downward—right where the neck and hump meet.¹

Even if the neck and hump are part of the same object, the positioning of the segments makes it very unlikely it is a living creature's "head" and "neck" connected just under the water. Since the head is dark and foreshortened, there is no way to tell if the head is in fact a stubby end as pictured, or perhaps a gnarled tree root branching away at an angle.



Figure 2: The object Sandra Mansi photographed at Lake Champlain in 1977, traced from an enlargement. Illustration by Benjamin Radford.



Figure 3: Photograph of the author in a field experiment at Lake Champlain. A one-foot scale marker is photographed at 150 feet. Using that scale, the alleged lake creature Sandra Mansi photographed in 1977 can be measured.

Several attempts were made at estimating the object's size (Mansi said twelve to fifteen feet; LeBlond suggested sixteen to fifty-six feet). If valid, these large estimates would suggest a lake monster, but these measurements were very indirect and fraught with error. There is, however, a more accurate and direct way of determining whether or not Sandra Mansi's account of her sighting matches with the photographic evidence she provides.

Replicating the Mansi Photograph

Many armchair analyses had been conducted to determine the size of the object, with little solid results. The lack of reference objects and known distances make the task formidable. However, the analysis can be approached from a different angle: Though we don't know the absolute size of—and distance to—the object, we do know what Sandra Mansi *reported* as the size and distance. With those variables fixed, it is then a fairly straightforward process to determine if the object is the size she (and others) say it is.

In order to help judge the validity of the Mansi photo, we visited Lake Champlain to do field work and original experiments. Following an unfruitful attempt to locate the exact original site, we chose a spot on Lake Champlain in the general area. Joe Nickell stood approximately eight feet above the waterline; this height is similar to that reported by Sandra Mansi (kneeling down atop a six-foot ledge).

I entered the lake holding a three-foot, black-and-white scale marker, measured off in one-foot lengths. Photographs (using the same type of camera Mansi used in 1977—a Kodak Instamatic, fixed-focus 110) were taken at fifty foot intervals ending up at 150 feet from shore (see figure 3). The distances were measured directly, calibrated using a synthetic string to avoid any stretching in the water.²

With the camera at the height Mansi claimed (about eight to nine feet), and the marker in the water at the distance she claimed (150 feet), this should allow us to measure the size of an object in that scale. Any object of a claimed size at a certain distance (at a given focal length) will take up a given measurable space in the print. I measured the size of the one-foot scale



Figure 4: A six-foot-tall creature "neck" at 150 feet from the camera. If the estimates given by Mansi are correct, her photograph and this one should look very similar in terms of height above the waterline. (Since the neck was the only dimension being measured, the hump and head portions were excluded.)

at 150 feet on our photograph, marked that, and transferred the measurement to the Mansi image scaled to the same size.

For comparison, rather than use the most commonly seen version of the photograph, I traveled to Connecticut to study the rarely seen original print. I carefully measured the Champ object in comparison to the whole photo, not the magnified and cropped commercial version that appears in books and magazines (and is necessarily reproduced here).

Unfortunately for those claiming that the Mansi object is huge, the numbers don't add up. All of the previous estimates of the object's size were dramatically overstated. The "neck" is nowhere near the previous estimates of six to eight feet or more; instead, the object is just over three feet out of the water, and both segments together are about seven feet across.³

In order to double-check the results I also worked backward, using a photograph of a mock Champ neck and head held six feet above the water at 150 feet (see figure 4). If Mansi's estimates are correct, the neck height in her photo and ours should look very similar. Using that scale for measurement, I verified that my estimate was indeed accurate.

Note that my analysis is based upon Sandra Mansi's own estimates and testimony. Because the object in the photo is inconsistent with the claimed height, those who wish to maintain that the object is six feet or taller (and fifteen feet or longer) will have to decide which parts of Mansi's story they think are false (or inaccurate). There is no way to be sure exactly how large the object is, but estimates of the distance and the size cannot both be correct; either—or both—are wrong.

At least one researcher, J. Richard Greenwell, has examined the photo and believes that Mansi's 150-foot distance estimate is correct: "we concluded that that object, whatever it is, was there in the lake at that estimated distance" (Greenwell 1992). The most likely explanation is that Mansi simply thought the object was bigger than it was. This effect is well known to be a factor in eyewitness reports; Joe Zarzynski himself warns about it: "many estimates of length tend to be overstated" (Zarzynski 1987, 109). Yasushi Kojo, another Champ researcher, also states that "the sizes of the animals are frequently overestimated in sighting reports" (Kojo 1991).

This revelation sheds a whole new light on the object in the Mansi photograph; with the size approximately half that of all previous estimates, the range of possible candidates becomes far larger—including perhaps a large bird, known animal, or a floating tree stump. The revised size is also inconsistent with many Champ descriptions. If the main eyewitness is to be believed, this "extremely good evidence" for Champ (and, by extension, other lake monsters) is even weaker than previously suspected.

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Notes

1. In his book Zarzynski admits that the head and hump are not obviously connected. He does, however, show an "electronic heavy enhancement of the Mansi photograph demonstrating 'that the monster's back and head are connected.'" I remain unconvinced; the "heavy enhancement" seems to have done little but emphasize the dark patches—which would of course include the head's shadow.
2. Nickell also took duplicate photos with his own 35 mm camera (published here at full size). For comparison, we verified that both cameras were of the same focal length.
3. An examination of the original print of the Mansi photo is helpful but not essential for this analysis. A less accurate comparison using the least-cropped publicly available version of the photo (in the April 1998 issue of *Discover* magazine) yields a neck height of about four feet.

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The Rorschach Inkblot Test, Fortune Tellers, and Cold Reading

.....
*Famous clinical psychologists used the Rorschach Inkblot Test to arrive at incredible insights.
But were the astounding performances of these Rorschach Wizards merely a variation
on astrology and palm reading?*

JAMES M. WOOD, M. TERESA NEZWORSKI,
SCOTT O. LILIENFELD, and HOWARD N. GARB

Psychologists have been quarreling over the Rorschach Inkblot Test for half a century. From 1950 to the present, most psychologists in clinical practice have treasured the test as one of their most precious tools. And for nearly that long, their scientific colleagues have been trying to persuade them that the test is well-nigh worthless, a pseudo-scientific modern variant on tea leaf reading and Tarot cards.

Introduced in 1921 by the Swiss psychiatrist Hermann Rorschach, the test bears a charming resemblance to a party game. A person is shown ten inkblots and asked to tell what each resembles. Like swirling images in a crystal ball, the ambiguous blots tell a different story to every person who

*Excerpted by the authors from their book
What's Wrong With the Rorschach? Science Confronts the Controversial Inkblot Test (2003, Jossey-Bass).*

gazes upon them. There are butterflies and bats, diaphanous dresses and bow ties, monkeys, monsters, and mountain-climbing bears. When scored and interpreted by an expert, people's responses to the blots are said to provide a full and penetrating portrait of their personalities.

The scientific evidence for the Rorschach has always been feeble. By 1965, research psychologists had concluded that the test was useless for most purposes for which it was used. The most popular modern version of the Rorschach, developed by psychologist John Exner, has been promoted as scientifically

The Rorschach test cannot detect most psychological disorders (with the exception of schizophrenia and related conditions marked by thinking disturbances), nor does it do an adequate job of detecting most personality traits.

superior to earlier forms of the test. In 1997 the Board of Professional Affairs of the American Psychological Association bestowed an award on Exner for his "scientific contributions" and applauded his version of the Rorschach as "perhaps the single most powerful psychometric instrument ever envisioned."

Such bloated claims to the contrary, however, research has shown that Exner's approach is beset by the same problems that have always plagued the test. The Rorschach—including Exner's version—tends to mislabel most normal people as "sick." In addition, the test cannot detect most psychological disorders (with the exception of schizophrenia and related conditions marked by thinking disturbances), nor does it do an adequate job of detecting most personality traits (Lilienfeld 1999; Lilienfeld, Wood, and Garb 2000).

Despite such shortcomings, the Rorschach is still administered hundreds of thousands of times each year in clinics, courts, and schools. Psychologists often use the test to help courts determine which parent should be granted custody of a child. It's used in schools to identify children's emotional problems, and in prisons to evaluate felons for parole. Convicted murderers facing the death penalty, suspected victims of sexual abuse, airline pilots suspended from their jobs for alcohol abuse—all may be given the Rorschach by a psychologist who will use the test to make critical decisions about their lives.

In the 1940s and 1950s the Rorschach was unblushingly

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promoted as a "psychological x-ray" that could penetrate the inner secrets of the psyche. Although it failed to live up to such promises, the test still possesses a powerful mystique.

Blind Analyses and the Rorschach Mystique

Why is such a scientifically dubious technique so revered among psychologists? The lasting popularity of the Rorschach has little to do with empirical validity. Certainly one secret of the Rorschach's success is clinicians' tendency to rely on striking anecdotes about its extraordinary powers—rather than on careful scientific studies—when assessing its value. Psychologists who treasure the Rorschach can recount colorful stories of how the test miraculously uncovered hidden facts about a patient that other tests failed to detect. Indeed, the test's rise to popularity was due mainly to the near-magical performances—known as "blind analyses"—that Rorschach experts exhibited to their amazed colleagues during the 1940s and 1950s.

In a blind analysis, the Rorschach expert was told a patient's age and gender and given the patient's responses to the blots. From this modest sample of information, the expert would then proceed to generate an amazing, in-depth description of the patient's personality. During the 1950s, the ability to make such astounding "blind diagnoses" came to be regarded among American psychologists as the mark of a true Rorschach genius.

Stunning performances by Rorschach "wizards" converted many psychologists of the era into true believers. For example, one highly respected psychologist has reported how, while still a student, he attended case conferences at which the famed Marguerite Hertz interpreted Rorschachs. Hertz's astute observations based on the test were "so detailed and exact" that at first he regarded them with great skepticism.

However, the young man's doubts dissolved the day that he and a fellow student presented the Rorschach results of a patient they both knew very well: "We fully expected Hertz to make errors in her interpretation. We were determined to point these out to the group. . . . We were shocked, however, when Hertz was able to describe this patient after reading only the first four or five responses. . . . Within 25 minutes Hertz not only told us what we already knew but began to tell us things we hadn't seen but which were obviously true once pointed out" (Kaplan and Saccuzzo 1982, 379).

Such astounding performances had a profound effect on many budding psychologists. As a leading clinical researcher observed, "Blind analysis is one of the spectacular aspects of the Rorschach technique and has probably been the most important factor in the acceptance of the Rorschach" (Zubin 1954, 305).

Rorschach Wizards: A Puzzle in Need of an Explanation

The performances of Rorschach wizards bore more than a superficial resemblance to palm reading and crystal ball gazing,

although few psychologists of the 1950s were prepared to recognize this connection. By the early 1960s, however, the wizards' astonishing successes were beginning to turn into a puzzle in need of an explanation. Research revealed that Rorschach virtuosos didn't possess any miraculous powers. To the contrary, in several well-known studies, leading Rorschach experts failed miserably when they attempted to make predictions about patients (e.g., Little and Shneidman 1959; see discussion by Dawes 1994).

Such findings presented a striking paradox. If Rorschach wizards stumbled so badly in controlled studies, how could they produce such amazing performances in blind analyses? The answer to this question was understandable to anyone familiar with the wiles of palm readers.

A Few Simple Tricks

Two shrewd commentators of the late 1940s had already divined that at least some Rorschach wizards achieved their success by resorting to tricks. In a clever and sometimes humorous article, J.R. Wittenborn and Seymour Sarason of Yale identified three simple stratagems of Rorschach interpreters that tended to create a false impression of infallibility (Wittenborn and Sarason 1949).

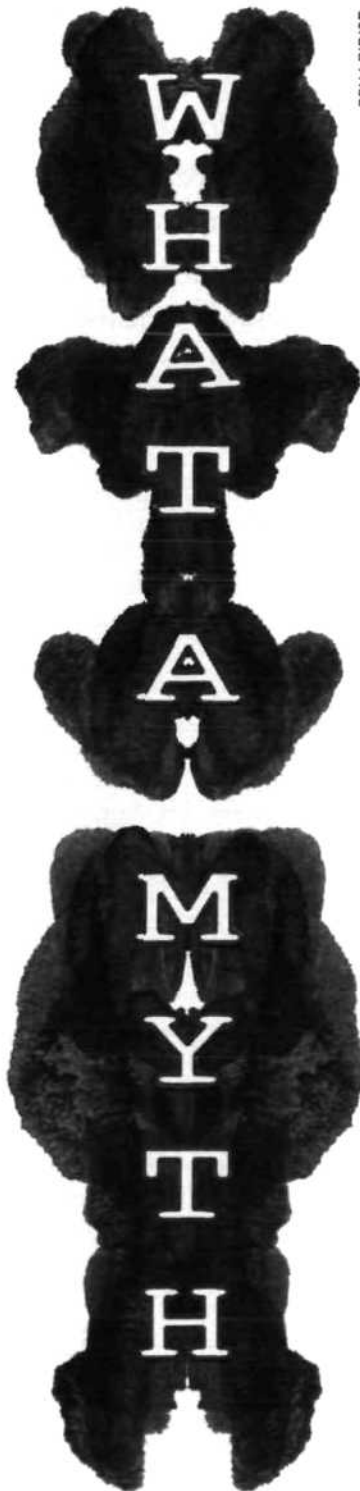
The first stratagem was as old as the Delphic Oracle of ancient Greece, whose notoriously ambiguous prophecies were crafted to turn out correct, no matter which direction events took. The Oracle once told a king that if he went to war he'd destroy a great nation. Encouraged, he launched an attack and was disastrously defeated. The prophecy wasn't wrong, however. After all, the Oracle hadn't said *which* nation the king would destroy.

Wittenborn and Sarason noted that Rorschach interpreters resorted to a similar tactic, delivering "ambiguous phrases or esoteric Rorschach clichés which can be given almost any specific interpretation which subsequent developments may require."

Second, Wittenborn and Sarason observed, Rorschach adepts sometimes ensured their success by including several inconsistent or even contradictory statements in the same interpretation: "One or the other of these statements may be employed according to the requirements of the circumstances. Such resourcefulness on the part of the examiner is often ascribed to the test itself."

Third, Wittenborn and Sarason observed, Rorschach experts sometimes enhanced their reputations by giving impressive interpretations *after* they learned the facts of a case: "Some clinical psychologists, when told about some clinically important features of a patient, say, 'Ah, yes. We see indications of it here, and here, and here.'"

Gerald Fried



Despite the tricks described by Wittenborn and Sarason, however, it's difficult to believe that all Rorschach wizards of the 1940s and 1950s were conscious fakes. The explanation is almost certainly more complicated than that. But before proceeding further, we'll pause to discuss the psychology of astrology and palm reading.

The Barnum Effect

In the late 1940s, psychologist Bertram Forer published an eye-opening study that he called a "demonstration of gullibility" (Forer 1949). After administering a questionnaire to his introductory psychology class, he prepared personality sketches. For example: "Disciplined and self-controlled outside, you tend to be worrisome and insecure inside. At times you have serious doubts as to whether you have made the right decision or done the right thing. You prefer a certain amount of change and variety and become dissatisfied when hemmed in by restrictions and limitations."

Forer asked the students to rate their own sketches for accuracy. The students gave an average rating of "very good." More than 40 percent said that their sketch provided a *perfect* fit to their personality.

The results seemed to show that Forer's personality questionnaire possessed a high degree of validity. However, there was a diabolical catch: Forer had given all the students the same personality sketch, which he manufactured using horoscopes from an astrology book. The students had gullibly accepted this boiler-plate personality description as if it applied to them uniquely as individuals.

Although the statements borrowed from the astrology book were seemingly precise, they applied to almost all people. Following the eminent researcher Paul Meehl, psychologists now call such personality statements "Barnum statements," after the great showman P.T. Barnum who said, "A circus

should have a little something for everybody" (he's also credited with, "There's a sucker born every minute").

As Forer had discovered, people tend to seriously overestimate

the degree to which Barnum statements fit them *uniquely*. For example, students in one study who were given Barnum statements disguised as test results responded with glowing praise: "On the nose! Very good"; "Applies to me individually, as there are too many facets which fit me too well to be a generalization."

Belief in the intuitive powers of Rorschach wizards is difficult to reconcile with the revelations of research. When the supposedly extraordinary insight of Rorschach experts has been tested in rigorously controlled studies, results have been disappointing.

Astrologers and Palm Readers

Astrologers and palm readers have long used Barnum statements (along with a few other stratagems) to create a false impression that they know the personality, the past, and even the future of people they've never met. The name for such bogus psychic practices is "cold reading" (Hyman 1981; Rowland 2002). Skillful cold readers apply the Barnum principle in many ways, for example by spicing their readings with statements like these: "You're working hard, but you have the feeling that your salary doesn't fully reflect your efforts"; and "You think that somewhere in the world you have a twin, someone who looks just like you." Such statements appear personal and individualized, but in fact are true of many American adults.

After being warmed up with Barnum statements, most clients relax and begin to respond with nonverbal feedback, such as nods and smiles. In most psychic readings, there arrives a moment when the client begins to "work" for the reader, actively supplying information and providing clarifications. It's at this critical juncture that a skillful cold reader puts new stratagems into action, such as the technique called the "push" (Rowland 2002). A psychic using the push begins by making a specific prediction (even though it may miss the mark), then allows feedback from the client to transform the prediction into something that appears astoundingly accurate:

Psychic: I see a grandchild, a very sick grandchild, perhaps a premature baby. Has one of your grandchildren recently been very sick?

Client: No. I . . .

Psychic: This may have happened in the past. Perhaps to someone very close to you.

Client: My sister's daughter had a premature girl several years ago.

Psychic: That's it. Many days in the hospital? Intensive Care? Oxygen?

Client: Yes.

By using the push, a cold reader can make a guess that's wildly off target appear uncannily accurate. The push and other techniques are effective because, by the time the cold reader begins using them, the client has abandoned any lingering skepticism and is in a cooperative frame of mind, thereby helping the psychic to "make things fit."

Intriguingly, scholars who have studied the psychology of palm reading and astrology agree that although some psychics are conscious frauds, many sincerely believe in their paranormal powers. For example, psychologist Ray Hyman, professor emeritus at the University of Oregon, published a classic article on cold reading in the *SKEPTICAL INQUIRER* in which he described his own saga as a palm reader (Hyman 1981). While in high school, Hyman was originally doubtful about the validity of palm reading.

But after trying it himself, he became persuaded that it could work magic, particularly when he received a great deal of positive feedback from clients. He became a fervent believer in palm reading and made a "side" living from it for some time.

Then one day a friend suggested that Hyman provide his interpretations backwards, giving clients interpretations that were exactly the *opposite* of what the palm reading textbooks suggested. To Hyman's amazement, the "backwards" interpretations were received equally well (if not better) by clients. This sobering experience persuaded him that the "success" of palm reading had nothing to do with the correctness of the interpretations. As such cautionary tales illustrate, Barnum statements can fool both the client who believes them and the naïve psychic who believes the client.

Rorschach Wizards: Three Explanations

Having taken a detour into the realm of astrology and palm reading, we're ready to return to the land of Rorschach wizards. Let's begin by considering three plausible explanations for the spectacular performances of the Rorschach virtuosos of the 1950s.

First, it's possible that these Rorschach wizards possessed a special clinical insight, a heightened intuition, that allowed them to surpass ordinary human limitations. Drawing on their unique clinical talents and their experience with thousands of patients, they developed an uncanny skill that allowed them to extract unexpected insights from inkblots.

Of course, this is the view that Rorschach devotees have generally preferred. Even today, many psychologists exhibit an extraordinary faith in the powers of clinical intuition. However, belief in the intuitive powers of Rorschach wizards is difficult to reconcile with the revelations of research. As we mentioned earlier, when the supposedly extraordinary insight of Rorschach experts has been tested in rigorously controlled studies, results have been disappointing. Given such findings, it's implausible that the Rorschach wizards of the 1950s were possessed of extraordinary clinical insight. Thus, we have to

consider a second explanation for their extraordinary performances: Maybe they were frauds.

Thanks to the shrewd article by J.R. Wittenborn and Seymour Sarason of Yale that we discussed earlier, there's little question that some Rorschachers of the 1940s and 1950s used tricks that lent the test a false impression of infallibility. However, it's extremely unlikely that all Rorschach wizards of the era were conscious frauds. Several prominent Rorschach experts, such as Marguerite Hertz (whose interpretive skills we described earlier), were known to be people of high integrity. Thus we're led to a third explanation: The uncanny Rorschach wizards of the 1950s were probably cold readers who, like the young palm reader Ray Hyman, were deceived by their own performances.

The Rorschach Wizard as Cold Reader

If blind diagnosis with the Rorschach was really just cold reading, how could it have worked? A Rorschach wizard about to give a blind analysis usually has access to much more information than do most fortune tellers. First, Rorschach responses usually contain valuable clues regarding a patient's intellectual capacity and educational level. Furthermore, many responses provide hints regarding the patient's interests or occupation.

As an interesting example, the Rorschach analysis of Nobel-prize-winning molecular biologist Linus Pauling has recently been published (Gacono et al. 1997). Here are a few of his responses to the blots: "The two little central humps at the top suggest a sine curve. . . ." "This reminds me of blood and the black of ink, carbon and the structure of graphite. . . ." "I'm reminded of Dalí's watches. . . ."

Even non-wizards can guess that the person who produced these Rorschach responses was well educated in mathematics ("sine curve") and chemistry ("the structure of graphite"), and probably had broad cultural interests (the reference to artist Salvador Dalí).

Besides such clues contained in the Rorschach responses, other sources of information are often available to a wizard. The fact that the test results come from a particular clinic or hospital can be informative. For example, if the test comes from an inpatient psychiatric unit, the chances are high that the patient is suicidal or out of touch with reality.

Thus, the Rorschach wizard who undertakes a "blind diagnosis" is often in possession of a wealth of information that would make a palm reader envious. In the early part of the diagnostic performance, this information can be fed back to the listeners in classic "cold reading style." For example, with Linus Pauling's Rorschach, the reading might begin: "Hmmm. This is obviously a very bright individual. Well educated, a 'cerebral' type. Focuses on thoughts, probably avoids reacting to events in a purely emotional way. I have the impression of a scientist rather than a business person or artist, though I do see some artistic tendencies."

If the Rorschach comes from a particular source—for

example, a therapist who works with moderately troubled clients—the wizard can use appropriate Barnum statements. For instance, here's a safe statement that fits virtually all clients one way or another: "This patient's emotions tend to be inconsistent in terms of their impact on thinking, problem solving, and decision-making behaviors. In one instance thinking may be strongly influenced by feelings. In a second instance, even though similar to the first, emotions may be pushed aside and play only a peripheral role. . . ." This statement, based on a recent Rorschach text (Exner 2000, 87), might well have come from Bertram Forer's famous astrology book. Notice that the statement merely says that the client's thoughts sometimes control his feelings, but that his feelings

The Rorschach wizard who undertakes a "blind diagnosis" is often in possession of a wealth of information that would make a palm reader envious. In the early part of the diagnostic performance, this information can be fed back to the listeners in classic "cold reading style."

sometimes control his thoughts. Although the statement appears to be saying something important and specific, in fact it applies to virtually all therapy clients (and probably virtually all readers of this article!).

Such Barnum statements are apparently still taken seriously by many psychologists today, judging from the large number of Rorschach books that are purchased each year. Thus we can be fairly sure that when Rorschach wizards of the 1950s spouted similar phrases during blind analyses, their colleagues thought something important was being said.

Once the listeners were "warmed up" by such apparently profound insights, the Rorschach wizard's job became much easier. Abandoning any initial skepticism, listeners probably began giving subtle or not-so-subtle feedback by nodding or smiling. The wizard could use this feedback as a guide for making increasingly precise statements. In all likelihood, wizards probably used something like the push, described earlier. For instance, here's a hypothetical example of how the push could be used Rorschach-style:

Wizard: There are signs of a very severe trauma, it could be recent. Perhaps a rape? Or a violent assault?

Listener: No. She . . .

Wizard: This trauma may have happened in her teen years or even earlier. She may be repressing it so she doesn't remember.

THE RORSCHACH INKBLOT TEST, FORTUNE TELLERS, AND COLD READING
Continued on page 61

Can Minds Leave Bodies?

A Cognitive Science Perspective

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Many people believe that the mind can leave the body at death and during out-of-body experiences. Research in cognitive science, however, has shown that this belief is implausible and suggests other explanations.

D. ALAN BENSLEY

Thirty-nine dead bodies were neatly laid on cots, each dressed in a black robe and Nike sneakers with their heads covered in hoods. Was this some kind of ritual murder? No, this was the 1997 mass suicide of the Heaven's Gate cult resulting from a dangerous combination of belief in dualism, religion, and extrasensory contact with aliens. Cult members believed they were in telepathic contact with extraterrestrials who invited them to a new and better world. To rendezvous with the alien ship, they believed they had to "exit their vehicles." This code expression for killing the body to free the soul reveals a dualistic belief in the separateness of mind and body. For cult members, the body was just a device for temporarily carrying the soul.

This dualistic belief may seem extreme, but other, more common paranormal beliefs (such as belief in ghosts, astral projection, and reincarnation), also imply that the mind or soul can separate from the body. I will examine the dualistic belief from the cognitive science perspective. Cognitive science is an interdisciplinary approach to the study of the mind. It combines the psychological study of mental processes such as consciousness and perception with the study of the brain, philosophy, and other disciplines. Research in cognitive science has shown that mind depends on the functioning of the brain in the physical world. Consequently, the mind cannot "go outside" of the brain.

Origins of Dualistic Paranormal Belief

The idea that the soul can leave the body is a very old one found in many cultures (Frazer 1996). A common belief is that when someone dreams of traveling to a place, the soul actually leaves the body and journeys there. The ancient Egyptians believed the soul could leave the body at death. In their burial ceremonies, the Ba, a human-headed bird representing the soul or breath of life, was breathed back into the mummified body to ensure life after death. In the book of Genesis, God breathed the spirit of life into Adam's body formed from the dust of the Earth to make man a living soul. These examples illustrate how the soul or spirit has been commonly associated with air. Like the air we breathe, the soul is ephemeral, essential to life, and can leave the body. In his detailed study of religious rituals from around the world, Sir James Frazer reported that the Itonamas of South America would close a dying person's mouth and nose to prevent the soul from departing and taking other souls with it. In some cultures, people have used traps to recapture souls that have escaped (see figure 1). Comparing the beliefs of many non-Western cultures, Shiels (1978) found evidence that almost 95 percent of them believed that a soul or spiritual entity could leave the body in some form. The most common occasion for such an experience was during sleep, but some reported the occurrence from illness, use of drugs, and trance states.

Much of the modern dualistic belief in the separability of soul and body had its origins in Greek and Christian thought. Plato, the fifth century B.C. Greek philosopher, believed that the body was a vessel containing the soul and that the mind was the immortal part of the soul that left the body at death to be reincarnated. Over the centuries, many Christians have believed that the soul lives on after physical death, retaining the powers of perception and feeling despite being separated from the body.

René Descartes, the brilliant philosopher-mathematician of the seventeenth century, did much to frame the dualistic position. He began his philosophy by doubting everything. He realized he could doubt the existence of his body and the rest of the physical world, but he could not logically doubt that he was doubting. His famous statement, "I think, therefore I am," exemplifies this reasoning. Because he could doubt the physical world but not his mind, he reasoned that the mind and body must be fundamentally different. In particular, he believed the body was made of physical substance extended in space while

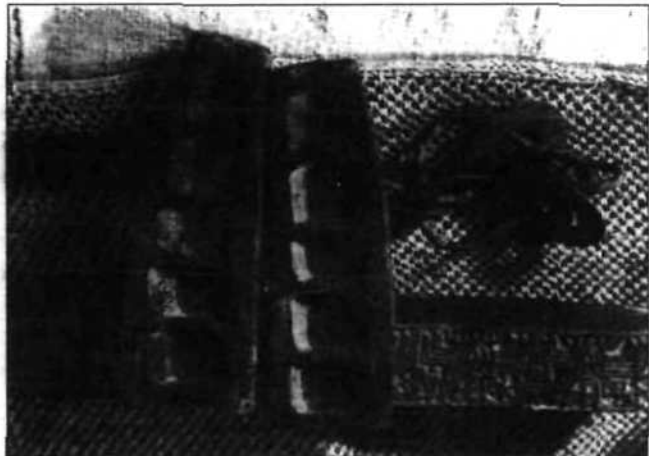


Figure 1: Shaman's spirit trap lying vertically against a print block with magic characters from the Laotian-Thai border. Reprinted by permission of the publisher from Frazer (1996), *The Illustrated Golden Bough*. Simon & Schuster Editions.

the mind or soul was non-physical and not extended. Descartes' position, called substance dualism, has raised fundamental questions about how a non-physical mind could have an effect on a physical body. Nevertheless, many people persist in this belief as if there were no mind-body problem.

Current Belief

Belief in dualism is an important part of our commonsense or folk psychology. Intuitively, my mind and body do appear to be different. I can use my mind to imagine I have no gray hair, but one look in the mirror tells me otherwise. I can imagine I am in California when physically I am sitting at my computer in Maryland. I can decide to move my leg, and it seems as if my mind is causing my body to move. These examples suggest that my mental experience and physical events overlap; but they are not the same. However, it is one thing to imagine that one's mind is separate from one's body and quite another to believe it can *actually* separate from the body. To believe the latter is tantamount to holding a paranormal belief, according to many cognitive neuroscientists who have consistently shown that the mind depends on brain function. Recently, such scientists have paid increasing attention to the dualism found in people's commonsense beliefs because such beliefs are diametrically opposed to their own scientific knowledge of the brain.

Research outside of cognitive science has also shown dualistic, paranormal belief to be prevalent in everyday thinking. The most recent Gallup Poll on paranormal belief in the U.S. found that such beliefs are widespread and may even be on the rise (Newport and Strausberg 2001).

Other research further indicates that mind-body dualism is related to paranormal belief. Cognitive psychologist Keith Stanovich (1989) found that many American college students

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he tested had high scores on a dualistic belief scale. Moreover, those students with stronger dualistic belief also tended to report stronger belief in ESP, except for Baptists. Another study by Michael Thalbourne (1999) found that dualism in Australian students was significantly correlated with paranormal belief such as belief in life after death and in the possibility of contact with spirits of the dead.

Despite popular belief, many scientists and skeptics doubt the mind can leave the body. The most common opposing view has been materialism or physicalism, a philosophical position maintaining that everything, including mind, is essentially physical.

Not surprisingly, many writers in parapsychology, including Lloyd Auerbach (1986), John Beloff (1989), and J.B. Rhine and J.G. Pratt (1957), have made dualistic statements claiming or implying the separation of mind and body. James Alcock (1987) has contended that parapsychology treats mind-body dualism as an essential assumption.

Despite popular belief, many scientists and skeptics doubt the mind can leave the body. The most common opposing view has been materialism or physicalism, a philosophical position maintaining that everything, including mind, is essentially physical. Materialists say the mind only appears to be invisible and not part of the natural physical world. For centuries, scientists have developed physical explanations of many apparently invisible and mysterious phenomena. The wind in the trees is not the movement of some invisible ether, but of many tiny particles of oxygen, nitrogen, and other gases. Along the same lines, materialists have hoped that the soul or mind would be explained in physical terms, much as the wind and air have been. Cognitive scientists, who are rooted in materialism, have sought to explain mental processes in terms of brain activity resulting from physical changes in the environment. So it is not surprising that they and other scientists have pressed for physical evidence that a mind or soul could leave the body.

The Out-of-Body Experience (OBE)

At least initially, the OBE appears to be good evidence that the mind can separate from the body. The term itself, however, is neutral as to whether or not a person has actually left the body and asserts only that a person has had the *experience* of having done so (Palmer 1978). OBEs are fairly common, with estimates ranging from about 10 to 20 percent of the population reporting they have had at least one, depending on the survey (Rogo 1984). OBEs occur in various ways, such as in religious, drug-induced, near-death, meditational, hypnotically induced, or spontaneous experiences (Grosso 1976). Furthermore, OBEs are not associated with any psychological disorder (Tobacyk and Mitchell 1987).

Shortly after college, I had a spontaneous OBE in which it seemed as if some observing part of me had separated from my body. I had lain down on the sofa for a few minutes but had not gone to sleep. Suddenly, it seemed as if I could clearly "see" my entire body lying on the sofa below me for a few seconds before I returned to my usual perspective. Though brief, my OBE had two basic features. First, it seemed as if the experiencing part of me was located at a point outside my physical body. Second, it seemed as though I was consciously perceiving and not dreaming the experience. Like many people who have had an OBE, I have also had lucid dreams, that is, dreams during which I became aware of myself dreaming (Glicksohn 1989). Researchers have found a low but reliable correlation between OBEs and lucid dreaming (Irwin 1988).

In fact, sometimes OBEs arise from lucid dreams and may even be indistinguishable from them (Levitan et al. 1999). Yet my experience did not seem like a dream, lucid or otherwise—it seemed like perception. At the time, however, I did not know what it was, and I assumed my OBE was a case of astral projection. Similarly, about this same time I had what I knew was a dream in which I was "flying around" in a kitchen, and I told myself that I was dreaming about astral projection.

The many anecdotal reports of such experiences have sometimes been taken as strong evidence that the mind can actually leave the body (Crookall 1963). However, the usefulness of such anecdotal reports is very limited (Bensley 1998). Although they may provide a rich source of information about the details and "feel" of an experience, OBE descriptions are typically not very well documented, not repeatable, and unverifiable. Often the details of what an OBE experiencer claims to have seen have been found to be inaccurate (Blackmore 1982).

To obtain better evidence, researchers have used the experimental method, which allows for testing under more controlled conditions to study OBEs. Typically, experimenters have examined the question by testing the accuracy of a subject's perception during an OBE or by looking for some physical sign in the environment that the experiencer has left the body. Despite some strikingly positive results reviewed by Charles Tart (1998), experimental demonstrations have not, in general, shown out-of-body perception to be reliably accurate. Nor has research unambiguously supported the claim that the experiencer can affect the environment when taking an out-of-body excursion (Blackmore 1982, 1992). After reviewing the literature, Blackmore (1982) suggested that adopting a cognitive psychological approach to study OBEs would be more productive.

The Cognitive Science Approach

Traditionally, cognitive scientists have viewed the brain as a kind of complex information processing system, like a computer. The system inputs data through the senses, holds the information in memory, and transforms it into various

intermediate states before outputting in the form of behavior. Information processing occurs in the brain as nerve cells send and receive messages using special chemicals called neurotransmitters. Many of these nerve cells are part of processing units and circuits dedicated to processing specific kinds of information. Research with brain scanning has found specific areas of the brain that "light up" or are active when individuals engage in specific mental processes, such as perceiving, attending, remembering, forming mental images, and using language (Posner and Raichle 1994). The brain uses the combined activity of these specific neural processors to form mental representations of the physical world. For example, although perceiving a face depends on the combined activity of multiple brain areas, when one area of the temporal lobe specialized for processing faces is damaged, a person is unable to recognize even his or her own face.

The brain uses its representations to construct an elaborate and usually accurate model of the world—a kind of running simulation. For example, research has shown that the brain has map-like representations of various parts of the body such as the face, arm, and hand. These maps in the brain represent the body in visual and somatic form, carrying detailed information of both how the body looks and feels (Ladavas, Zelon, and Farne 1998). It is important to note, however, that while mental representations, such as visual images, may seem vivid and accurate, they are not exact copies of the physical world in the same way a photograph represents the detail of some object. Moreover, the brain can make a mistake in constructing its model, resulting in misperception of the body or some other part of the world.

The phantom limb experience provides a compelling example of how mental experience of the body depends on the brain's representations of it, and also how perception of the body can be in error. People who have lost a limb, such as a leg, often report they feel the sensation of pain in their missing foot. This, of course, is physically impossible if we assume the pain is originating from the missing foot. However, if we assume that the brain still has a representation of the missing foot, then the perception of pain depends on brain activity (Ramachandran and Hirstein 1998). Could the OBE occur in a similar way, that is, could the brain activate a representation of the body in some unusual way that leads to misperception of the body?

Applying methods from cognitive psychology to study OBEs, Susan Blackmore (1987) found that experiencers used mental imagery differently from those who do not have OBEs. Based on the work of Nigro and Neisser (1983), she found that experiencers were more likely to use an observer or "bird's-eye view" perspective in describing their dreams than others. They were also better able to switch their viewpoint in a mental image, and had clearer and more vivid imagery of their dreams. Blackmore argued that this "bird's-eye view" perspective is like the "over the body" perspective often taken during OBEs. When a person begins to lose normal sensory contact,

such as when falling asleep or during sensory deprivation, this unusual perspective may be adopted. The brain seeks to identify which is the best model or interpretation of the incoming sensory data at the time, and this becomes the model of reality that best fits. The system seeks to reestablish sensory contact, and mistakenly picks the wrong model from memory such as the "over the head" perspective and treats it as real. OBE experiencers' greater vividness and clarity of imagery may contribute to the sense of reality they experience during OBEs. Harvey Irwin (1986) has obtained results similar to Blackmore (1987). However, he found that some people had *somatic* OBEs (related to the feeling of the body being outside) while

The drug ketamine, called "Special K" on the street and used as an anaesthetic before surgery, often produces OBEs. Karl Jansen has argued that the experience produced by ketamine is very much like the near-death experience.

others had *visual* OBEs (related to seeing the body as outside). In these two different cases, the subjects may be paying more or less attention to the visual versus somatic information in the complex representations of their bodies.

Blackmore's research suggests that disturbances in the brain may produce OBEs. Consistent with this prediction, Canadian neurosurgeon Wilder Penfield (1955) was apparently able to produce an OBE by stimulating a patient's brain with minute electrical currents prior to operating on the patient for temporal lobe epilepsy. Before surgical removal of a damaged area that caused the debilitating seizures, Penfield would routinely stimulate different places in the patient's brain, such as in the right temporal lobe shown in Figure 2, to prevent the inadvertent removal of healthy brain tissue. Once, after he had electrostimulated a point in this area, the patient, who had previously had an OBE, exclaimed "I am leaving my body" and then showed a strong fear reaction (Penfield 1955, 458).

Recently, Olaf Blanke and his colleagues (2002) have used electrostimulation of the brain to produce a more convincing OBE in a forty-three-year-old epileptic woman. While trying to find the focus of her brain damage, they stimulated points in the right angular gyrus (shown in figure 2), producing various disturbances in the perception of her body. When stimulated at different intensities, she reported feeling that she was "sinking into the bed," "falling from a height," and seeing parts of her body shortening (Blanke et al. 2002, 269). At one point she had an OBE in which she saw her trunk and legs from above, the same portion of her body she had felt when stimulated before. However, when they stimulated her epileptic focus in her temporal lobe, over 5 cm away from the angular gyrus, she did not have an OBE. Blanke and his colleagues proposed that it was stimulating her angular gyrus that produced the OBE by disrupting the integration of somatosensory and vestibular

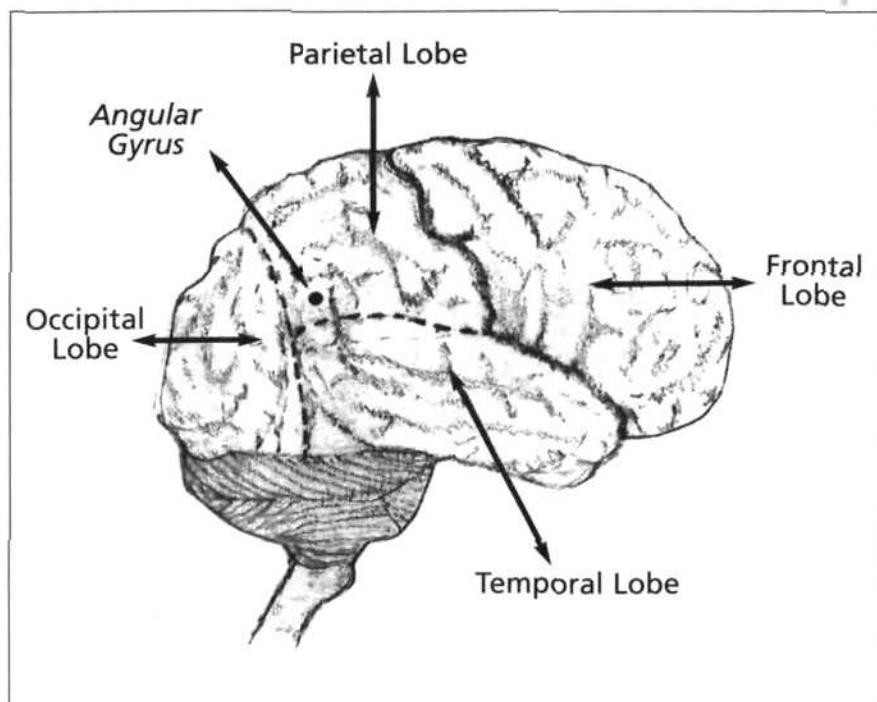


Figure 2: A right hemisphere view drawn to show the lobes of the brain and the point in the angular gyrus of the parietal lobe that Blanke and his colleagues (2002) stimulated to produce an OBE.

information—that is, information about the feel and position of her body. These findings support the idea that the brain produces the conscious perception of an embodied self from the coordinated activity of various brain regions.

Drug effects on the brain can also produce OBEs. The drug ketamine, called “Special K” on the street and used as an anaesthetic before surgery, often produces OBEs. Karl Jansen (1997) has argued that the experience produced by ketamine is very much like the near-death experience (NDE) in which people often report the experience of floating above the body, traveling through a dark tunnel into the light, seeing God, and the conviction that they were actually dead. Although naturally occurring NDEs may result from various causes, ketamine may produce an artificial version of the NDE and an associated OBE by blocking neural transmission in the temporal lobe.

The question arises as to how physical events in the natural environment could produce electrochemical changes in the brain that lead to OBEs. One possibility proposed by Michael Persinger (1995) is that variations in the Earth’s magnetic field produced by movement of its tectonic plates could lead to OBEs under the right conditions. Persinger obtained data on the changes in Earth’s geomagnetic activity from the National Geophysical Data Center keeping track of the particular level that each subject experienced during testing. First, he externally applied a weak electromagnetic field across large areas of his subjects’ brains while depriving them partially of sensory stimulation to enhance awareness of their cognitive processes. Then he had them rate the degree to which they felt detached from their bodies. At a separate session, subjects also answered questions from which he could infer each subject’s history of

complex, partial epileptic-like experiences. He found that those subjects who had the most epileptic-like experiences also tended to report the most detachment from their bodies on days when geomagnetic activity was at higher levels in general. The geomagnetic disturbance may have destabilized activity in the temporal lobes of those people who had the most epileptic-like experiences. Although this finding may further suggest that cognitive science is moving toward an explanation of the OBE in natural, physical terms, it should be interpreted with caution given the low correlation and our current lack of understanding of how Earth’s electromagnetic activity affects brain activity.

Other evidence from evolutionary psychology and the study of consciousness has supported the brain basis of the OBE. It is striking to note that the animals with brains most like our own, the chimpanzee, orangutan, and gorilla, are the only land animals aside from us that

can recognize the image of their own bodies in a mirror as belonging to themselves (Gallup 1982). This conscious ability to recognize one’s body as an objective part of oneself seems to be related to the brain’s ability to form a mental representation of one’s body that can be inspected. It also implies the need for the brain to construct a representation of the self as part of its ongoing modeling of the world. Nicholas Humphrey has proposed that it would be adaptive for animals with complex social lives, such as humans and chimps, to include a model of the self in their model of the social world (Humphrey 1978). In this way they could more completely model the possible consequences of their own actions and the responses of others to them. Consistent with this theory, several researchers have found that, like humans, chimpanzees may develop at least the rudiments of a theory of mind allowing them to predict and understand some intentions and behaviors in relation to themselves (Suddendorf and Whitten 2000).

Recently, cognitive scientists have proposed paying more attention to the bodily aspects of experience, challenging traditional views of cognitive science that tend to neglect the body (Johnson 1995). Some argue that the brain’s representation of the body is central to its representation of the self (Damasio 1999; Eilan, Marcel, and Bermudez 1995). Some have even challenged traditional cognitive science’s emphasis on representation, instead arguing that mental experience is embodied and not due to abstract mental processes distinct from the physical system producing them (Varela, Thompson, and Rosch 1991). Others, like James Gibson, have emphasized the role of the environment in perceiving the self (Neisser 1993). Gibson has made the important point that when we see the environment we almost always see our bodies as well. For

example, when I look at the world in front of me I often see part of my leg, arm, or the bridge of my nose.

Supporting an embodied view of conscious experience, Monica Meijnsing (2000) has reanalyzed two relevant cases of nervous system damage originally reported by Cole and Pailard (1995). Although these patients have little sensory feedback from their bodies below the neck, they nevertheless have retained their body image. They have retained knowledge of how they look and how much space their bodies occupy while retaining very little control over the movement of their bodies. One of these patients compared her body to a machine saying she felt as if she were a pilot lodged in a ship that was hard to steer.

These striking cases suggest that a person's embodied experience depends on having an intact nervous system. However, whether cognitive scientists adopt the traditional representational view or the newer embodied cognition view, their common conclusion is that conscious experience of the body depends on brain and nervous system function. It follows that anomalous experiences of the body depend on brain and nervous system function as well.

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Memory Recovery Techniques in Psychotherapy

Problems and Pitfalls

Memory recovery techniques that are widely used in psychotherapy including hypnosis, age regression, guided imagery, dream interpretation, bibliotherapy, and symptom interpretation can distort or create—rather than reveal—allegedly repressed traumatic memories.

STEVEN JAY LYNN, ELIZABETH F. LOFTUS,
SCOTT O. LILIENFELD, and TIMOTHY LOCK

In 1997, Nadean Cool won a \$2.4 million malpractice settlement against her therapist in which she alleged that he used a variety of suggestive memory recovery procedures to persuade her that she had suffered horrific abuse and harbored more than 130 personalities including demons, angels, children, and a duck. Prior to therapy, Nadean recounted problems typical of many women including a history of bulimia, substance abuse, and mild depression. During her five-year treatment, Nadean's therapist allegedly maintained that she could not improve unless she uncovered repressed traumatic memories. To do so, Nadean participated in repeated hypnotic age regression and guided imagery sessions, and was subjected to an exorcism and

fifteen-hour marathon therapy sessions. Nadean recalled frightening images of participating in a satanic cult, eating babies, being raped, having sex with animals, and being forced to watch the murder of her eight-year-old friend after these interventions, and her psychological health deteriorated apace. Eventually Nadean came to doubt that the recovered memories were "real," terminated treatment with her therapist, and recouped much of the ground she had lost.

Although Nadean Cool's therapy strayed far beyond conventional practice, her therapist is in the company of many professionals who perform so-called "memory work" to help clients retrieve memories of ostensibly repressed abuse. Poole, Lindsay, Memon, and Bull (1995) reported that 25 percent of licensed doctoral level psychologists surveyed in the United States and Great Britain indicated that they: (a) use two or more techniques such as hypnosis and guided imagery to facilitate recall of repressed memories; (b) consider memory recovery an important part of treatment; and (c) can identify patients with repressed or otherwise unavailable memories as early as the first session (see Polousny and Follette 1996 for similar findings). In addition, over three-quarters of the U.S. doctoral-level psychotherapists reported using at least one memory recovery technique to "help clients remember childhood sexual abuse." In this article we consider a number of widely used memory recovery procedures, and whether they can distort or create, rather than reveal, traumatic memories.

Clinical Techniques

Guided Imagery

One important class of techniques relies on guided imagery, in which patients imagine scenarios described by the therapist. So long as imagery techniques focus on current problems, as in visualizing pleasant scenes to develop relaxation skills, there is probably little cause for concern about false memory creation. However, the use of imagery to uncover allegedly repressed memories is controversial and warrants concern because people frequently confuse real and imagined memories, particularly when memories are initially hazy or unavailable. Roland (1993), for example, proposed using visualization to jog "blocked" memories of sexual abuse, and a "reconstruction" technique for recovering repressed memories of abuse. According to Poole et al. (1995), 32 percent of U.S. therapists report using "imagery related to the abuse."

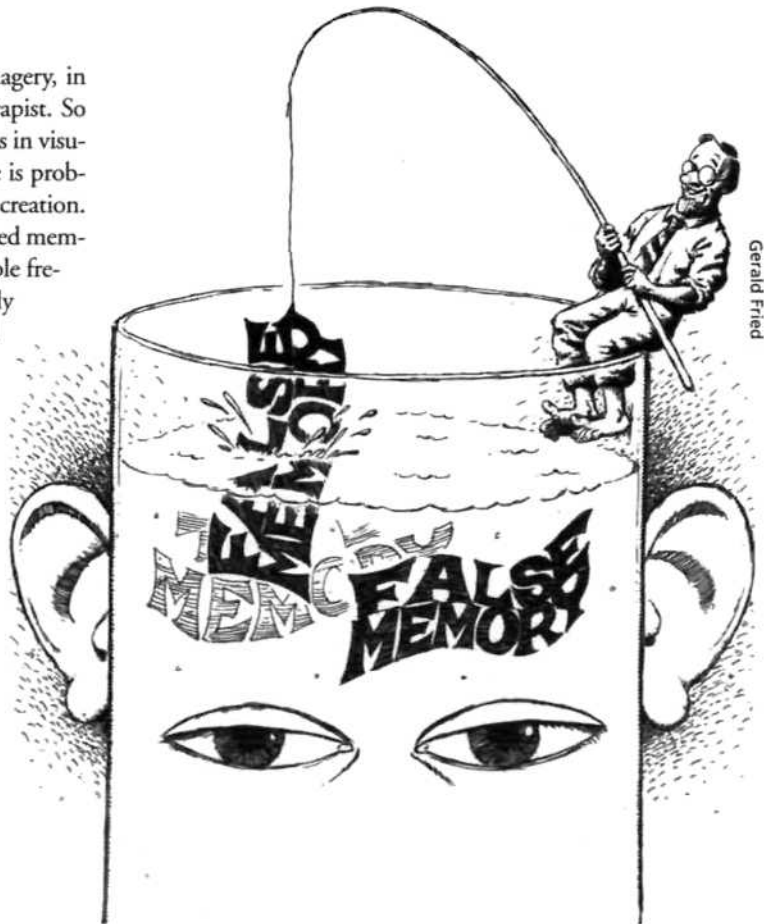
Suggesting False Memories

Memory errors are not random. What is recalled depends on current beliefs, inferences, guesses, expectancies, and suggestions. People can clearly be led by suggestions to integrate a fabricated event into their personal histories. In Loftus's research (Loftus, Coan, and Pickrell 1996; Loftus and Pickrell 1995), twenty-four participants were asked by an older sibling to remember real and fictitious events (e.g., getting lost in a shopping mall). The older sibling ini-

tially provided a few details about the false event, such as where the event allegedly occurred, after which the subjects were interviewed one to two weeks apart. A quarter of the subjects claimed to remember the false event; some provided surprisingly detailed accounts of the event that they came to believe had actually occurred. Similar studies with college students have shown that approximately 20–25 percent report experiencing such fictitious events as: (a) an overnight hospitalization for a high fever and a possible ear infection, accidentally spilling a bowl of punch on the parents of the bride at a wedding reception, and evacuating a grocery store when the overhead sprinkler systems erroneously activated (Hyman et al. 1995); and (b) a serious animal attack, serious indoor accident, serious outdoor accident, a serious medical procedure, and being injured by another child (Porter, Yuille, and Lehman 1998).

Hypnosis

Many therapists endorse popular yet mistaken beliefs about hypnosis. Yapko's (1994) survey revealed that 47 percent of a sample composed of professionals had greater faith in the accuracy of hypnotic than non-hypnotic memories, 54 percent believed to some degree that hypnosis is effective for recovering memories as far back as birth, and 28 percent believed that hypnosis is an effective means of recovering past life memories. If hypnosis were able to accurately retrieve forgotten memories, confidence in its use for recovering memories would be warranted. But this is not the case. The following conclusions are based on major reviews of the literature¹:



- (1) Hypnosis increases the sheer volume of recall, resulting in both more incorrect and correct information. When the number of responses is statistically controlled, hypnotic recall is no more accurate than nonhypnotic recall.
- (2) Hypnosis produces more recall errors and higher levels of memories for false information.
- (3) False memories are associated with subjects' levels of hypnotic suggestibility. However, even relatively non-suggestible participants report false memories.
- (4) Hypnotized persons sometimes exhibit less accurate recall in response to misleading questions compared with nonhypnotized participants.
- (5) In general, hypnotized individuals are more confident about their recall accuracy than are nonhypnotized individuals, and an association between hypnotizability and confidence has been well documented.
- (6) Even when participants are warned about possible memory problems associated with hypnosis, they continue to report false memories during and after hypnosis, although some studies indicate that warnings decrease pseudomemories.
- (7) Contrary to the claim that hypnosis facilitates the recall of emotional or traumatic memories, hypnosis does not improve recall of emotionally arousing events (e.g., films of shop accidents, depictions of fatal stabbings, a mock assassination, an actual murder videotaped serendipitously), and arousal level is not associated with hypnotic recall.
- (8) Hypnosis does not necessarily produce more false memories or unwarranted confidence in memories than highly suggestive nonhypnotic procedures. However, simply asking participants to focus on the task at hand and to do their best to recall specific events yields accurate recall comparable to hypnosis, but with fewer or comparable recall errors.

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Our dour assessment of hypnosis for recovering memories has been echoed by professional societies, including divisions and task forces of the American Psychological Association and the Canadian Psychiatric Association. The American Medical Association (1994) has asserted that hypnosis be used only for investigative purposes in forensic contexts. However, even when hypnosis is used solely for investigative purposes, there are attendant risks. Early in an investigation, the information obtained through hypnosis could lead investigators to pursue erroneous leads and even to interpret subsequent leads as consistent with initial and perhaps mistaken hypnotically generated evidence.

Searching for Early Memories

According to Adler (1931), "The first memory will show the individual's fundamental view of life. . . . I would never investigate a personality without asking for the first memory (p. 75)." More recently, Olson (1979) articulated a belief shared by many therapists (Papanek 1979) that "[Early memories] when correctly interpreted often reveal very quickly the basic core of one's personality . . . and suggest . . . bedrock themes with which the therapist must currently deal in treating the client" (p. xvii).

Most adults' earliest reported memories date back to between 36 and 60 months of age. Virtually all contemporary memory researchers agree that accurate memory reports of events that occur before 24 months of age are extremely rare (see Malinoski, Lynn, and Sivec 1998), due to developmental changes that influence how children process, retrieve, and share information. Adults' memory reports from 24 months of age or earlier are likely to represent confabulations, condensations, and constructions of early events, as well as current concerns and stories heard about early events (Spanos 1996). Although certain early memories might well have special significance,² such memories are highly malleable. Malinoski, Lynn, and Green (1999) examined early memories in a study in which interviewers probed for increasingly early memories until participants twice denied any earlier memories. Participants then received "memory recovery techniques" similar to those advocated by some therapists (e.g., Farmer 1989, Meiselman 1990). Interviewers asked participants to see themselves "in their mind's eye" as a toddler or infant, and "get in touch" with memories of long ago. Participants were informed that most young adults can retrieve memories of very early events—including their second birthday—if they "let themselves go" and try hard to visualize and concentrate. Interviewers then asked for subjects' memories of their second birthdays and reinforced increasingly early memory reports.

The average age of the initial reported memory was 3.7 years: Only 11 percent of individuals reported memories at or before age 24 months, and 3 percent reported a memory from age 12 months or younger. However, after receiving the visualization instructions, 59 percent of the participants reported a memory of their second birthday. After interviewers pressed for even earlier memories, the earliest memory reported was 1.6 years, on average. Fully 78.2 percent of the sample reported at least one memory that occurred at or earlier than 2 years, outside the boundary

of infantile amnesia. More than half (56 percent) of the participants reported a memory between birth and 18 months of life; a third (33 percent) reported a memory that occurred at age 12 months or earlier; and 18 percent reported memories dated from six months or earlier. Remarkably, 4 percent of the sample reported memories from the first week of life!

Age-regression

Age-regression involves "regressing" a person back through time to an earlier life period. Subjects are typically asked to mentally recreate events that occurred at successively earlier periods in life, or to focus on a particular event at a specific age, with suggestions to fully relive the event. A televised documentary (*Frontline* 1995) showed a group therapy session in which a woman was age-regressed through childhood, to the womb, and eventually to being trapped in her mother's Fallopian tube. The woman provided a convincing demonstration of the emotional and physical discomfort that one would experience if one were indeed stuck in such an uncomfortable position. Although the woman may have believed in the veracity of her experience, research indicates that her regression experiences were not memory-based. Instead, age-regressed subjects behave according to situational cues and their knowledge, beliefs, and assumptions about age-relevant behaviors. According to Nash (1987), age-regressed adults do not show the expected patterns on many indices of development, including brain activity (EEGs) and visual illusions. No matter how compelling, "age regressed experiences" do not represent literal reinstatements of childhood experiences, behaviors, and feelings.

Hypnotic Age-regression

Although hypnosis is often used to facilitate the experience of age regression, it can distort memories of early life events. Nash, Drake, Wiley, Khalsa, and Lynn (1986) attempted to corroborate the memories of subjects who had participated in an earlier age regression experiment. This experiment involved age regressing hypnotized and role-playing (control) subjects to age three to a scene in which they were in the soothing presence of their mothers. During the experiment, subjects reported the identity of their transitional objects (e.g., blankets, teddy bears). Third-party verification (parent report) of the accuracy of recall was obtained for fourteen hypnotized subjects and ten control subjects. Hypnotic subjects were less able than were control subjects to identify the transitional objects actually used. Hypnotic subjects' hypnotic recollections matched their parent's reports only 21 percent of the time, whereas control subjects' reports were corroborated by their parents 70 percent of the time.

Sivec and Lynn (1997) age-regressed participants to the age of five and suggested that they played with a Cabbage Patch Doll (if a girl) or a He-Man toy (if a boy). These toys were not released until two or three years after the target time of the age regression suggestion. Half of the subjects received hypnotic age regression instructions and half received suggestions to age regress that were not administered in a hypnotic context. While none of the nonhypnotized persons was influenced by the suggestion, 20 percent of the hypnotized subjects rated the memory as real and were confident that the event occurred at the age to which they were regressed.

Past Life Regression

The search for traumatic memories can extend to well before birth (see Mills and Lynn 2000). "Past life regression therapy" is based on the premise that traumas that occurred in previous lives contribute to current psychological and physical symptoms. For example, psychiatrist Brian Weiss (1988) published a widely publicized series of cases focusing on patients who were hypnotized and age regressed to "go back to" the origin of a present-day problem. When patients were regressed, they reported events that Weiss interpreted as having their source in previous lives.

Vivid and realistic experiences during age regression can seem very convincing to both patient and therapist. However, Spanos, Menary, Gabora, DuBreuil, and Dewhurst (1991) determined that the information participants provided about specific time periods during their hypnotic age regression was almost "invariably incorrect" (p. 137). For example, one participant who was regressed to ancient times claimed to be Julius Caesar, emperor of Rome, in 50 B.C., even though the designations of B.C. and A.D. were not adopted until centuries later, and even though Julius Caesar died decades prior to the first Roman emperor. Spanos et al. (1991) informed some participants that past life identities were likely to be of a different gender, culture, and race from that of the present personality, whereas other participants received no prehypnotic information about past life identities. Participants' past life experiences were elaborate, conformed to induced expectancies about past life identities (e.g., gender, race), and varied in terms of the pre-hypnotic information participants received about the frequency of child abuse during past historical periods. In summary, hypnotically induced past life experiences are fantasies constructed from available cultural narratives about past lives and known or surmised facts regarding specific historical periods, as well as cues present in the hypnotic situation (Spanos 1996).

Symptom Interpretation

Therapists often inform suspected abuse victims that their symptoms suggest a history of abuse (Blume 1990, Fredrickson 1992). Examples of symptom interpretation can be found in many popular psychology and self-help sources (e.g., Bass and Davis 1992). Some popular self-help books on the topic of incest include lists of symptoms (e.g., "Do you use work or achievements to compensate for inadequate feelings in other parts of your life?") that are presented as possible or probable correlates of childhood incest. Blume's "Incest Survivors' Aftereffects Checklist" consists of thirty-four such correlates. The scale instructions read: "Do you find many characteristics of yourself on this list? If so, you could be a survivor of incest." Blume also indicates that "clusters" of these items predict childhood sexual abuse, and that "the more items endorsed by an individual the more likely that there is a history of incest." Many of the characteristics on such checklists are vague and applicable to many non-abused individuals. Much of the seeming "accuracy" of such checklists could stem from "P.T. Barnum effects"—the tendency to believe that highly general statements true of many individuals in the population apply specifically to oneself (Emery 2002).

Although there may be numerous psychological correlates of sexual abuse (but see Rind, Tromovitch, and Bauserman 1998, *for a competing view*), no known constellation of specific symptoms, let alone diagnosis, is indicative of a history of abuse. Some genuine victims of childhood incest experience many symptoms, others only some, and still others none. Moreover, nonvictims experience many of the same symptoms often associated with sexual abuse (Tavris 1993). Nevertheless, Poole et al. (1995) found that more than one-third of the U.S. practitioners surveyed reported that they used symptom interpretation to recover suspected memories of abuse.

Bogus Personality Interpretation

For ethical reasons, researchers have not directly tested the hypothesis that false memories of childhood abuse can be elicited by informing individuals that their personality characteristics are suggestive of such a history. However, studies have shown that personality interpretation can create highly implausible or false memories. Spanos and his colleagues (Spanos, Burgess, Samuels, and Blois 1999) informed participants that their personality indicated that they had a certain experience during the first week of life. After participants completed a questionnaire, they were told that a computer-generated personality profile based on their responses indicated they were "High Perceptual Cognitive Monitors," and that people with this profile had experienced special visual stimulation by a mobile within the first week of life. Participants were falsely told that the study was designed to recover memories to confirm the personality test scores. The participants were age regressed to the crib; half of the participants were hypnotized and half received non-hypnotic age regression instructions. In the non-hypnotic group, 95 percent of the participants reported infant memories and 56 percent reported the target mobile. However, all of these participants indicated that the memories were fantasy constructions or they were unsure if the memories were real. In the hypnotic group, 79 percent of the participants reported infant memories, and 46 percent reported the target mobile. Forty-nine percent of these participants believed the memories were real, and only 16 percent classified the memories as fantasies.

DuBreuil, Garry, and Loftus (1998) used the bogus personality interpretation paradigm and non-hypnotic age regression to implant memories of the second day of life (crib group) or the first day of kindergarten (kindergarten group). College students were administered a test that purportedly measured personality and were told that, based on their scores, they were likely to have participated in a nationwide program designed to enhance the development of personality and cognitive abilities by means of red and green moving mobiles. The crib group was told that this enrichment occurred in the hospital immediately after birth, and the kindergarten group was told that the mobiles were placed in kindergarten classrooms. Participants were given the false information that memory functions "like a videotape recorder" and that age regression can access otherwise inaccessible memories. Participants were age regressed (non-hypnotically) to the appropriate time period and given sugges-

tions to visualize themselves at the target age. Twenty-five percent of the kindergarten group and 55 percent of the crib group reported the target memory. All kindergarten participants believed that their memories corresponded to real events. In the crib group, 33 percent believed in the reality of their memories, 50 percent were unsure, and 17 percent of participants did not believe in the reality of their memories.

Dream Interpretation

Viewed by Freud as the "royal road to the unconscious," dreams have been used to provide a window on past experiences, including repressed traumatic events. For example, van der Kolk, Britz, Burr, Sherry, and Hartmann (1984) claimed that dreams can represent "exact replicas" of traumatic experiences (p. 188), a view not unlike that propounded by Fredrickson (1992), who argued that dreams are a vehicle by which "Buried memories of abuse intrude into . . . consciousness" (p. 44).

The popularity of dream interpretation has waned in recent years. However, survey research indicates that at least a third of U.S. psychotherapists (37–44 percent) still use this technique (see also Brenneis 1997, Polusny and Follette 1996). These statistics are noteworthy given that no data exist to support the idea that dreams can be interpreted as indicative of a history of child abuse (Lindsay and Read 1994). When dreams are interpreted in this manner by an authority figure such as a therapist, rather than as reflecting the residues of the day's events or as the day's concerns seeping into dreams, it can constitute a strong suggestion to the patient that abuse actually occurred.

Mazzoni and her colleagues simulated the effects of dream interpretation of stressful yet non-abuse-related life events. Mazzoni, Lombardo, Malvagia, and Loftus (1997) had participants report on their childhood experiences on two occasions, three to four weeks apart. Between sessions, some subjects were exposed to a brief (half hour) therapy simulation in which an expert clinician analyzed a dream report that they had brought to the session. No matter what participants dreamed, they received the suggestion that their dream was indicative of having experienced certain events (e.g., being lost in a public place or abandoned by parents) before the age of three. Although subjects had indicated that they had not experienced these events before age three, many individuals revised their accounts of their past. Relative to controls who had not received the personalized suggestion, "therapy" participants were far more likely to develop false beliefs that before age three they had been lost in a public place, had felt lonely and lost in an unfamiliar place, and had been abandoned by their parents.

Mazzoni, Loftus, Seitz, and Lynn (1999) extended this paradigm to a memory of having been bullied as a child; dream interpretation increased participants' confidence that the event (being bullied or getting lost) had occurred, compared with control participants who were given a brief lecture about dreams. Six of the twenty-two participants in the dream interpretation condition recalled the bullying event and four of the five participants in the dream interpretation condition recalled getting lost. In conclusion, it is possible to implant childhood memories using personality and dream interpretation.

Bibliotherapy

Many therapists who treat patients with suspected abuse histories prescribe "survivor books" or self-help books written specifically for survivors of childhood abuse to provide "confirmation" that the individual's symptoms are due to past abuse and to provide a means of gaining access to memories. The books typically provide imaginative exercises and stories of other survivors' struggles, as well as potential support for actual abuse survivors. However, the fact that the writers interpret current symptoms as indicative of an abuse history and include suggestive stories of abuse survivors may increase the risk that readers will develop false memories of abuse. Some of the most influential popular books of this genre include Bass and Davis' (1988) *Courage to Heal*, Fredrickson's (1992) *Repressed Memories*, and Blume's (1990) *Secret Survivors: Uncovering Incest and Aftereffects in Women*.

Mazzoni, Loftus, and Kirsch (2001) provided a dramatic illustration of how reading material and psychological symptom interpretation can increase the plausibility of an initially implausible memory of witnessing a demonic possession. The study was conducted in Italy, where demonic possession is viewed as a more plausible occurrence than in America. However, in an initial testing session, all of the participants indicated that demonic possession was not only implausible, but that it was very unlikely that they had personally witnessed an occurrence of possession as children. A month after the first session, participants in one group read three short articles indicating that demonic possession is more common than is generally believed and that many children have witnessed such an event. Participants were compared with individuals who read three short articles about choking and with individuals who received no manipulation. Participants exposed to one of the manipulations returned the following week and, based on their responses to a fear questionnaire they completed, were informed (regardless of their actual responses) that their fear profile indicated that they had probably either witnessed a possession or had almost choked during early childhood.

When the original questionnaire was completed in a final session, 18 percent of the students indicated that they had probably witnessed possession. No changes in memories were evident in the control condition. In summary, events that were not experienced during childhood and initially thought to be highly implausible can, with sufficient credibility-enhancing information, come to be viewed as having occurred in real life.

Hypothesized Path of False Memory Creation

Imaginative narratives of sexual abuse that never occurred and past life reports arise when patients come to believe that the narrative provides a plausible explanation for current life difficulties. The narrative can achieve a high degree of plausibility due to many factors:

- (1) the prevalent belief that abuse and psychopathology are associated;
- (2) the therapist's support or suggestion of this interpretation;
- (3) the failure to consider alternative explanations for everyday problems;
- (4) the search for confirmatory

- data;
- (5) the use of suggestive memory recovery techniques that increase the plausibility of abuse and yield memories consistent with the assumption that abuse occurred;
- (6) increasing commitment to the narrative on the part of the client and therapist, escalating dependence on the therapist, and anxiety reduction associated with ambiguity reduction;
- (7) the encouragement of a "conversion" or "coming out" experience by the therapist or supportive community (e.g., therapy group), which solidifies the role of "abuse victim," and which is accompanied by reinforcing feelings of empowerment; and
- (8) the narrative's provision of continuity to the past and the future, as well as a sense of comfort and identity.

People are not equally vulnerable to the potentially suggestive influences of memory recovery procedures. At the very least it is necessary to believe that at least some memories remain intact indefinitely so that they can be retrieved, and that memory recovery techniques can retrieve these stored memories. In addition, fantasy prone, imaginative, compliant, as well as highly hypnotically suggestible people appear to be especially vulnerable to suggestive influences and to the development of false memories.

The evidence provides little support for the use of memory recovery techniques in psychotherapy. Contrary to the idea that people repress memories in the face of trauma, traumatic events are highly memorable (Shobe and Kihlstrom 1997). Even if a small percentage of accurate memories can be recovered in psychotherapy, there is no evidence for a causal connection between non-remembered abuse and psychopathology. In addition, the mere experience of painful emotions, when not tied to attempts to bolster positive coping and mastery, can be harmful (Littrell 1998). Indeed, there is no empirically supported psychotherapy that relies on the recovery of traumatic memories to achieve a positive therapeutic outcome. Adshead (1997) argued that if memory work with trauma patients is not effective, then "it would therefore be just as unethical to use memory work for patients who could not use it or benefit by it, as it would be to prescribe the wrong medication, or employ a useless surgical technique" (p. 437).

Before concluding, let us be clear about what the findings reviewed do not mean as well as what they do mean. First, all memory recovery techniques are not necessarily problematic. For example, the "cognitive interview" (Fisher and Geiselman 1992), which incorporates a variety of techniques derived from experimental research on memory (e.g., providing subjects with retrieval cues, searching for additional memorial details), holds promise as a method of enhancing memory in eyewitness contexts. Second, we do not wish to imply that all uses of hypnosis in psychotherapy are problematic. Controlled research evidence suggests that hypnosis may be useful in treating pain, medical conditions, and habit disorders (e.g., smoking cessation), and as an adjunct to cognitive-behavioral therapy (e.g., anxiety, obesity). Nevertheless, the extent to which hypnosis provides benefits above and beyond relaxation in such cases remains unclear (Lynn, Kirsch, Barabasz, Cardena, and Patterson 2001). The questionable scientific status of hypnosis as a memory recovery technique has no bearing on the

therapeutic efficacy of hypnosis, which must ultimately be investigated and judged on its own merits. Finally, we do not wish to claim that all memories recovered after years or decades of forgetting are necessarily false. We remain open to the possibility that certain recovered childhood memories are veridical, although further research is needed to document their existence and possible prevalence. These important and unresolved issues notwithstanding, the conclusion that certain suggestive therapeutic practices can foster false memories in some clients appears indisputable.

Notes

1. The following reviews were used as sources: Erdelyi 1994; Lynn, Lock, Myers, and Payne 1997; Lynn, Neuschatz, Fite, and Rhue 2001; Nash 1987; Spanos 1996; Steblay & Bothwell 1994; Witehouse, Dinges, E.C. Orne, and M.T. Orne 1988.
2. Some therapists do not assume that early memories reports are necessarily accurate but posit that such memories nevertheless provide a window into clients' personalities; the claim of these therapists is not of concern to us here.

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Required Reading Regarding the Creationism Controversy

PETER LAMAL

Denying Evolution: Creationism, Scientism, and the Nature of Science. By Massimo Pigliucci. Sinauer Associates, Sunderland, Mass., 2002. ISBN 0-87893-659-9. 338 pages. Paperback, \$24.95.

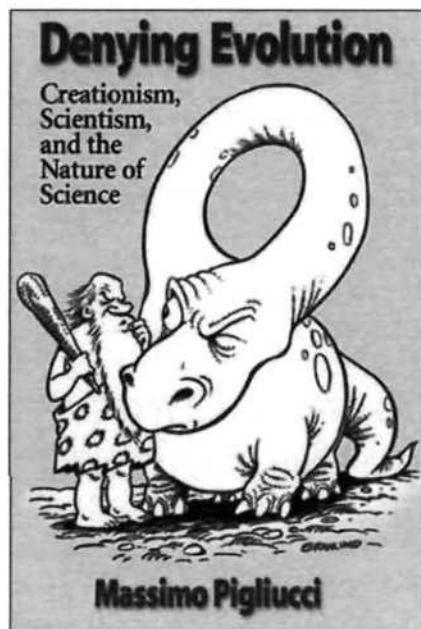
Why do so many Americans deny evolution? What can be done about this state of affairs? These are the fundamental questions comprising the foundation for Massimo Pigliucci's *Denying Evolution*. Pigliucci is an evolutionary biologist at the University of Tennessee and a veteran of public debates with evolution deniers.

Blaming the public for the pervasive denial of evolution is not productive. Rather, the "abysmal failure" of our educational system must be addressed, particularly by scientist-educators.

Pigliucci prefers the term "evolution denial" to "creationism" because the latter is not a viable theory of anything. Instead, creationism is a form of denial, analogous to the denial of the Holocaust.

Starting with Darwin, Huxley, and Hooker's publicity campaign in favor of Darwin's *The Origin of Species*, Pigliucci outlines major features of the evolution controversy and discusses evolution deniers such as William Dembski and Michael Behe. He believes that ignorance of the history of the controversy over evolution is what hampers any progress toward a resolution of the evolution-creation controversy.

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In my view, this is much too optimistic an attitude. It fails to appreciate the deep positive emotional effect produced by a belief in special creation. In principle, there could never be evidence sufficient enough and arguments persuasive enough to convince true believers (unfelicitously, true deniers) to subscribe to evolution. Or, if it is accepted, it will be on condition that at least at some point there was divine intervention. As Pigliucci points out, the controversy is really not about science but about philosophy and religion. In my view, the best we can hope for is that those who are wavering may be persuaded.

Pigliucci outlines the many varieties

of creationism, with special attention to intelligent design (ID) theory, a relatively new form that reached prominence in the mid-1990s. He gives ID detailed attention because of the sophisticated intellectual challenge it poses.

Pigliucci says anti-intellectualism, which Richard Hofstadter (in *Anti-intellectualism in American Life*, 1963) demonstrated is as old as colonial New England, is at the very basis of the creation-evolution controversy. Pigliucci describes five categories of anti-intellectualism and contrasts those with scientism. Scientism is "the fundamental belief that science can do no wrong and will ultimately answer any question worth answering while in the process saving humankind as a bonus." Not only is such hubris offputting to many, it is also erroneous. Pigliucci argues that science is not a body of knowledge; the knowledge commonly referred to as "scientific" is a product of science but does not define it. In contrast to science-as-knowledge, science is a method of uncovering and provisionally explaining observations about the world as well as predicting future observations. This is one of the most important points that Pigliucci makes, and the term *provisionally* is critical. One of the fundamental attractions of religion is that it provides certainty while science does not.

Pigliucci next describes and discusses eleven creationist fallacies, including the fallacy that evolution "is just a

theory." Another fallacy fundamental to the creation-evolution debate is that science is a religion.

Three major components of the controversy almost invariably come up: the second principle of thermodynamics; the origin of life; and the Cambrian explosion of species. Pigliucci discusses and refutes the creationist claims about each.

A short but critical chapter is devoted to scientific fallacies. Pigliucci says that "it is time that scientists face what both creationists, and philosophers and sociologists of science, have been telling them for some time now. Science is a human activity, and as such it is fallible." Perhaps the most serious fallacy that scientists and educators commit, Pigliucci avers, is the *rationalistic fallacy*. This is the notion that all you need to do is explain things a little bit better and people will see the light. But for many evolution deniers, explaining things better

will never have the desired effect.

What is to be done? Improve science education. Presumably there are individuals who can be convinced through better education. In the final chapter, Pigliucci lists and describes fourteen steps that must be taken in order to make progress in the creation-evolution controversy.

The book concludes with an appendix consisting of an introduction to, and excerpts from, David Hume's *Dialogues Concerning Natural Religion*, where the topic of intelligent design is discussed. A second appendix reproduces the speech that William Jennings Bryan planned to make as his closing argument in the Scopes Trial.

Denying Evolution is a must read for anyone interested in the continuing saga of the creation-evolution controversy. I also recommend Michael Ruse's *The Evolution Wars* (Rutgers University Press, 2000) to accompany *Denying Evolution*.

with a tailored tapping "algorithm" that will eliminate your problems in a matter of moments. You decide to give it a try.

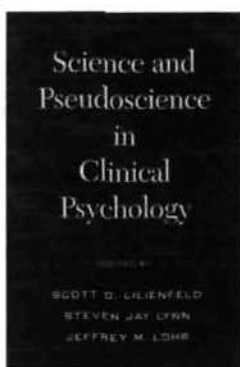
Sound far-fetched? This scenario actually is more common than most people realize. In a previous article, ("Can We Really Tap Away Our Problems? A Critical Analysis of Thought Field Therapy," by B.A. Gaudiano and J.D. Herbert, July/August 2000) I discussed the treatment described above, called Thought Field Therapy (TFT). Of course, it possesses no more scientific validation now than it did when I originally reviewed it, but the so-called "energy" psychology movement sparked by TFT continues to grow. Unfortunately, TFT is only one of a long and growing list of therapies currently being marketed to a public in search of quick relief from mental health problems and possessing little empirical support of safety or efficacy. The list of questionable treatments is becoming quite long indeed: Eye Movement Desensitization and Reprocessing, Critical Incident Stress Debriefing, Rebirthing Therapy, Emotion Freedom Techniques, Be Set Free Fast, Touch and Breathe, Neurolinguistic Programming, Auditory Integration Training, Dolphin-Assisted Therapy, Facilitated Communication, Past Life Therapy, Recovered Memory Therapy, and Alien Abduction Therapy, just to name a few.

It is within this context that psychologists Scott Lilienfeld, Steven Jay Lynn, and Jeffrey Lohr present *Science and Pseudoscience in Clinical Psychology*. Social psychologist Carol Tavris contributes the foreword, and sets a somewhat pessimistic (but necessary) tone as she briefs readers as to why both professionals and laypersons need to pay attention to the public health threats caused by unscientific treatment approaches. She proposes a possible impetus for the growth of pseudoscience within clinical psychology—the long-lamented scientist-practitioner gap. Tavris asserts that fundamental deficiencies exist in the training of clinicians, where the practice of psychology is often divorced from the science of psychology. This science-practice gulf produces therapists

The Disease of Pseudoscience and the Hope for a Cure

BRANDON A. GAUDIANO

Science and Pseudoscience in Clinical Psychology. By Scott O. Lilienfeld, Steven Jay Lynn, and Jeffrey M. Lohr (Eds.) Guilford Press, New York. ISBN: 1-57230-282-1, Hardcover, 474 pp., \$42.



Imagine that you have been experiencing a deep and persistent depression for the last few months and you realize that it is time to seek professional help. But first you decide to do a little research and search the Internet for the best treatment for your condition. A Web site catches your eye, promising "Permanent Relief from Depression and

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Anxiety in Minutes." You learn of a self-anointed "revolutionary" new treatment that can eliminate depression and anxiety in a matter of minutes without dangerous medications. The Web site informs you that your depression is caused by an energy "perturbation" in your "thought field" that can be corrected easily through simple techniques. In fact, all that you have to do is tap on certain body points as directed to "rebalance" your energy and your mood. You find out that you may not even have to leave your house, as the Web site claims that a therapist can talk to you over the phone, diagnose your specific energy disruption by looking at a visual display of your voice, and come up

easily duped by sham treatments in the quest to earn a respectable living in an age of managed care.

In Chapter 1, the editors present a more optimistic analysis of the situation and state that the book aims to assist readers of various backgrounds with the "important task of distinguishing techniques in clinical psychology that are scientifically supported or promising from those that are scientifically unsupported or untested." Even though they concur that the state of affairs within the field at times can look rather grim, they assert that this is not an intractable problem and suggest education as a possible remedy.

The editors point out that nonvalidated therapeutic techniques can actually be dangerous and even lethal. The 2000 death of a girl in Colorado at the hands of her therapists using "rebirthing" therapy is but one example. The editors note that unscientific practices are harmful in other ways as well. For example, individuals may get discouraged after trying several treatments without success, and this can keep them from trying an empirically supported therapy that might actually be beneficial.

Each of the book's five sections represent major areas of controversy. Part I discusses questionable assessment practices and diagnostic entities. This includes critiques of common "projective" tests such as the Rorschach Inkblot Test, and of controversial diagnoses such as Multiple Personality Disorder (MPD). Part I also provides some understanding of why clinicians may fall prey to errors in judgment, leading to erroneous beliefs like the diagnostic power of the Rorschach or the validity of MPD. Howard Garb and Patricia Boyle review the evidence from a wealth of experimental studies showing just how poor our judgment can be when based solely on experience. Many cognitive biases cloud our interpretations, requiring the use of objective methods and controls. Clinicians are no more immune from these biases than laypersons. Psychologist Paul Meehl put it this way: "It is absurd, as well as arrogant, to pre-

tend that acquiring a Ph.D. somehow immunizes me from the errors of sampling, perception, recording, retention, retrieval, and inference to which the human mind is subject."

The next three parts of the book cover controversies in psychotherapy and treatment. A host of respected scholars, including memory researcher Elizabeth

Issues involving the efficacy of trauma treatments have become increasingly urgent in the wake of terrorism acts and threats in recent years.

Loftus, present discussions on recovered memories. The authors conclude that the inappropriate use of techniques such as hypnosis and guided imagery can foster false memories in vulnerable patients. Much harm has been done by practitioners who have unwittingly promoted false claims of abuse based on supposedly recovered memories. Another chapter includes a review of the countless sham treatments for autism and other developmental disorders. Facilitated Communication is but one example of a discredited technique for autism.

Perhaps the worst victims of pseudoscience are those who were actual victims of a life-threatening traumatic event and who continue to suffer from the residual effects of that experience. Chapter 9 reviews some of the most popular but controversial treatments of the "trauma industry," including Eye Movement Desensitization and Reprocessing, Thought Field Therapy, and Critical Incident Stress Debriefing (CISD). CISD was originally developed as a brief group intervention with the laudable goal of preventing the development of posttraumatic stress disorder after a traumatic event. However, several controlled trials of CISD suggest that the treatment is inert at best and harmful at worst when conducted as originally proposed (*Lancet* 360 [9335]: 766-771, 2002). Issues involving the efficacy of trauma treatments have become increasingly urgent in the wake of terrorism acts

and threats in recent years.

The final part of the book focuses on pseudoscience in the media, including the self-help movement. Nona Wilson provides a cogent argument for better representation of the mental health field to the public. Little wonder that the public is ill-informed about empirically supported treatments when most of their knowledge

of mental health issues comes directly from the likes of "Dr. Phil" McGraw, radio show host "Dr. Laura" Schlessinger (whose doctorate is in physiology and not psychology or psychiatry), relationship "expert" John Gray (who holds no professional license), and motivational guru Tony Robbins (a practitioner of the pseudoscientific Neuro-linguistic Programming).

The editors have presented the evidence in as fair and balanced a way as possible. They urged contributors to remain objective and dispassionate in their presentations, attempted to provide constructive criticism, and chose not to only debunk these techniques when necessary, but also to discuss techniques that are scientifically supported. Furthermore, each chapter contains a glossary of terms to aid the reader in the sometimes dense terminology. Although the book is accessible to the nonprofessional, the volume is most appropriate for the mental health professional or student.

The editors conclude with recommendations for combating the current state of pseudoscience in the field through increased educational and professional efforts. This book is the first major volume devoted to a discussion of science and pseudoscience within the field of clinical psychology, and hopefully can help guide both professionals and patients toward valid treatments. If the patient is clinical psychology and the disease is pseudoscience, this book is part of the treatment.

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A Ramshackle Attempt to Validate Psi

MARTIN BRIDGSTOCK

The Trickster and the Paranormal. By George P. Hansen. Xlibris Corporation, Philadelphia, 2001. ISBN 1-4010-0082-7, 564 pp. Softcover, \$22.94.

The *Trickster and the Paranormal* is an ambitious book. There are over 400 pages of text and argument, more than 700 references and nearly fifty pages of notes. Author George Hansen states his central thesis early on: that “psychic phenomena are associated with processes of deconstructing.” The rest of the book supports and explains this cryptic utterance.

Two ideas are central to Hansen’s argument. One is the “liminal,” also termed the “interstitial.” This is the property of being outside normal intellectual and social structures, or on the boundaries between them. The second key idea is that of the “trickster,” a constellation of traits which includes dishonesty, playfulness, and sexual and scatological misbehavior. Where there is liminality—where normal structures and boundaries break down—there is the province of the trickster.

These may well be useful ideas. To think at all, we need distinctions and categories. Where concepts breach categories, intellectual and social problems can arise. It is easy to think of examples. Are transsexuals men or women? Are teenagers adults or children? Is a patient in an irreversible coma dead or alive? Liminality constantly challenges our ways of thinking, and serves up possibilities for confusion and misbehavior.

Hansen applies the concept of limi-

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nality to psychic phenomena. He argues that the paranormal is intrinsically liminal, and so leads to chaos, fraud, and incompatibility with established institutions. In one sense, skeptics can accept this easily. The paranormal has many of the attributes of liminality. It has large-scale public acceptance, but is not

Hansen believes that “psi is irrational, but it is also real.” That is, the chaotic and dishonest events in the paranormal field do not stem from its marginal position, but from the nature of the phenomena themselves.

regarded as established. It has whole industries devoted to it, but little in the way of strong evidence in its support. It is widely advocated, but not respectable. Therefore, we might predict that chaos and fraud would be the consequences.

However, Hansen’s thesis is much stronger than this. He believes that “psi is irrational, but it *is* also real.” That is, the chaotic and dishonest events in the paranormal field do not stem from its marginal position, but from the nature of the phenomena themselves. In the field of parapsychology, effects are unreliable and unlimited by time or space. The results of a psychic experiment may be affected by the experimental subject, the experimenter, and by anyone else in the universe, past or present. Therefore, Hansen argues, the paranormal is intrinsically liminal and chaotic, and not subject to rational ways of analysis. In his view, this means that essentially rational

organizations, like academia and CSICOP, must not only abolish the paranormal, but also any serious thought about it. As he says on page 365, “The agenda of rationalization faces an almost insurmountable problem—the serious study of magic has a magical influence. Thus the disenchantment process must eliminate not only magic, but also serious consideration of it.”

This is a big, big thesis. To support it, Hansen gallops over huge areas of the social and psychological sciences, as well as literary criticism, hoaxes, totemism, reflexivity, and government disinformation. He gives details of a UFO case he investigated and debunked. He also discusses academia, CSICOP, and hoaxing. However, skeptics are likely to focus on

one issue: the evidence. Hansen’s thesis rests on the claim that psi is both real and intrinsically chaotic. Does he present enough evidence to take this seriously?

In my judgment, Hansen fails this crucial test. Only one chapter in the book—out of twenty-six—is devoted to the evidence for psychic ability, and half of this chapter is concerned with concepts and theories. For more evidence, Hansen refers the reader to an enormous paper by Palmer, but this was published in 1977, a quarter-century ago! For a theory of this magnitude, it is reasonable to expect a comprehensive and up-to-date review of the evidence, statement of objections and counter-arguments, and a reasoned conclusion. We do not get this, and so the heart of Hansen’s thesis must simply be regarded as suspect.

The book has other faults. It is repetitive, sprawling, and obscure. We are told the same things repeatedly, and it is

often impossible to work out what Hansen is saying, or why. The best way to read the book is suggested by Michael

proceedings. That gives the reader a view of the central theme, and also the major weakness in Hansen's case.

narrow-mindedness. However, on many other occasions he relies upon academic research, and in these cases the researchers receive high praise, usually without it being mentioned that they work in academia.

The book really needs a strong edit and re-write. A better book might be 100 pages shorter and have a stronger section arguing for the validity of psi.

Hansen's concepts of liminality and the trickster are valuable when applied to the paranormal. However, the book has failed to make its main claims plausible, and both the bile and the lengthy rambles through marginally related fields render the argument less than totally convincing. □

Hansen's writing sometimes gives the impression of great resentment. He is particularly bilious toward academics, repeatedly making claims about their narrow-mindedness.

Grosso, a reviewer for the *Journal of Parapsychology*, read the conclusion first, and read chapter 21—presenting the laboratory evidence for psi—early in the

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SCIENCE BEST SELLERS

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HarperCollins
- 2** ***A Short History of Nearly Everything***
Bill Bryson
Broadway Books
- 3** ***Fast Food Nation: The Dark Side of the All-American Meal***
Eric Schlosser
Houghton Mifflin
- 4** ***Guns, Germs, and Steel: The Fates of Human Societies***
Jared Diamond
W.W. Norton and Co.
- 5** ***Merriam-Webster's Collegiate Dictionary***
Merriam-Webster, Inc.

- 6** ***A Mind at a Time***
Mel Levine
Touchstone Books
- 7** ***Nanotechnology: A Gentle Introduction to the Next Big Idea***
Mark A. Ratner, et al.
Prentice Hall PTR
- 8** ***Prime Obsession: Bernhard Riemann and the Greatest Unsolved Problem***
John Derbyshire
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Chip Brown
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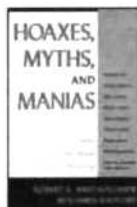
By arrangement with Amazon.com, May 2003.

Listing does not preclude future review.



Has Science Found God? The Latest Results in the Search for Purpose in the Universe. Victor J. Stenger. Prometheus Books, 59 John Glenn Drive, Amherst, NY 14228, 2003. 373 pp. \$30, hardcover. "Science Finds God," *Newsweek* blared on its July 20, 1998, cover. Has it? Victor Stenger (University of Hawaii and University of Colorado) draws on his forty years as an experimental physicist and his perspective in writing two previous books on science/religion issues to critically examine the contention. Specifically he applies science, reason, and evidence to the question of the existence of God or some transcendent element to the universe that would have significant, observable effects. He particularly deals with empirically based theories on the origin and nature of the universe and its laws; those on the origin and nature of life; and direct empirical claims for God or the supernatural. Despite the vast number of extraordinary discoveries in physics over the past four decades—and despite the over-hyped media proclamations contending that science has found religion—Stenger finds that the theories developed to describe the past forty years of discoveries "provide a comprehensive picture of the nature of a purely material universe that is consistent with all existing data."

thinking, intended so that readers can examine some quite specific topics along with the authors and see where they lead. The authors even urge readers to question or challenge the authors' own analyses of the topics, a practice that is a key hallmark of science. The topics include the Martian panic of 1938, the Roswell "flying saucer" crash of 1947, the "mad gasser" of Mattoon, the "jumping Frenchmen" of Maine, New England's great airship hoax, genital-shrinking scares, the dancing mania of the Middle Ages, the birthplace of the flying saucer, England's black helicopters, and India's "Monkey Man" mania. A final chapter is on "How to Recognize Mass Delusions."



Hoaxes, Myths, and Manias: Why We Need Critical Thinking. Robert E. Bartholomew and Benjamin Radford. Prometheus Books, 2003. 229 pp. \$20, softcover. A series of case studies in critical

Bartholomew (a sociologist) and Radford (*SKEPTICAL INQUIRER's* managing editor) show that cultural assumptions play a large part in our judgments and that critical reasoning is the best means of ensuring an objective perspective.



Mysterious Creatures: A Guide to Cryptozoology. George M. Eberhart. ABC-CLIO Inc., 130 Cremona Dr., P.O. Box 1911, Santa Barbara, CA 93116-1911. 2002. 722 pp.

\$185, hardcover. This two-volume encyclopedic set covers hundreds of mysterious creatures, including the most famous ones—Bigfoot, the Loch Ness Monster, and Champ—but also a surprisingly wide variety of obscure animals as well. Each creature is classified according to variant names, description, distribution, behavior, etc. The entries are fairly objective, and list the best explanations for the sightings. The criteria for inclusion as a "mysterious creature" are perhaps too liberal, with some entries based on little more than one folkloric source (and creatures such as leprechauns, elves, and fairies are listed). Complete with a comprehensive geographical index, a listing of lake and river monsters by region, and a lengthy section on animals discovered since 1900, this is an excellent (though prohibitively expensive) resource for those interested in unknown creatures.

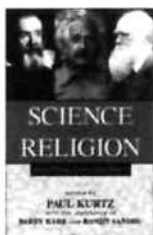


Pseudoscience and the Paranormal, Second Edition. Terence Hines. Prometheus Books, 2003. 500 pp. \$21, softcover. An updated and expanded edition of a useful text and guide to pseudoscience

and the paranormal first published in 1988. Hines, a psychologist (Pace University), has added two new chapters (on alternative medicine and the actual science of collective delusions and mass hysterias about alleged environmental health scares such as power lines, PCBs, and cell phone radiation). He has also added new sections (such as polygraphy) to previous chapters, retitled the previous "Psychoanalysis" chapter to "Pseudopsychology" to indicate the broader scope of quack psychotherapies, and updated and expanded other chapters as needed. Major topics covered, in addition to those already mentioned, include the nature of pseudoscience, psychics and psychic phenomena,

life after death, laboratory parapsychology, astrology, UFOs, alien astronauts, faith healing, and special topics in pseudoscience (autism and facilitated communication, creationism, dowsing, graphology, etc.). Heavily referenced so readers can easily locate primary sources.

Nightwork: A History of Hacks and Pranks at MIT. T.F. Peterson. The MIT Press, Five Cambridge Center, Cambridge, MA 02142. 2003. 176 pp. \$19.95, softcover. Massachusetts Institute of Technology, in addition to being one of the country's most prestigious educational institutions, also has a rich tradition of hacking. Before this term became associated with computers, it meant any sort of prank, practical joke, or other such mischief. MIT historian T.F. Peterson has assembled a collection of hacks and pranks ranging from hilarious sign defacements to the placement of police cars and cows on top of domed buildings. The book includes plenty of photographs, commentaries by current and former hackers, and an overview of the traditions. A good reminder that scientists and scholars have a sense of humor too.



Science and Religion: Are They Compatible? Edited by Paul Kurtz. Prometheus Books, 2003. 365 pp. \$20, softcover. Collection of articles on the ever-present tensions between science and religion from the *SKEPTICAL*

INQUIRER's two much-discussed Science and Religion issues (1999) and (2001), the CSI-COP/Center for Inquiry Science and Religion conference in Atlanta in 2001, the Fourth World Skeptics Congress (2002), *Free Inquiry* magazine, and other sources. Contributors include Stephen Jay Gould, Richard Dawkins, Arthur C. Clarke, Nobel laureates Steven Weinberg and Richard Feynman, Owen Gingerich, Steven Pinker, William Dembski, Neil de Grasse Tyson, James Lovelock, Eugenie Scott, Martin Gardner, Daniel C. Dennett, Morton Hunt, Chet Raymo, Taner Edis, Victor Stenger, and others. Includes sections on Cosmology and God, Intelligent Design (Creation vs. Evolution), Religion and Science in Conflict, Science and Ethics: Two Magisteria, The Scientific Investigation of Paranatural Claims, Scientific Explanations of Religious Belief, and Accommodating Science and Religion.

—Kendrick Frazier and Benjamin Radford

The Butterfly Theory of Truth

ROBERT MCHENRY

Nobody doesn't believe in the truth. Some people seemingly can take it or leave it alone, and some learn through long practice to profit from walking a line that is more

or less asymptotic to it, while yet others profess to believe that it doesn't exist but simultaneously believe that profession to be true. Scratch hard enough—it never need be terribly hard—and every-

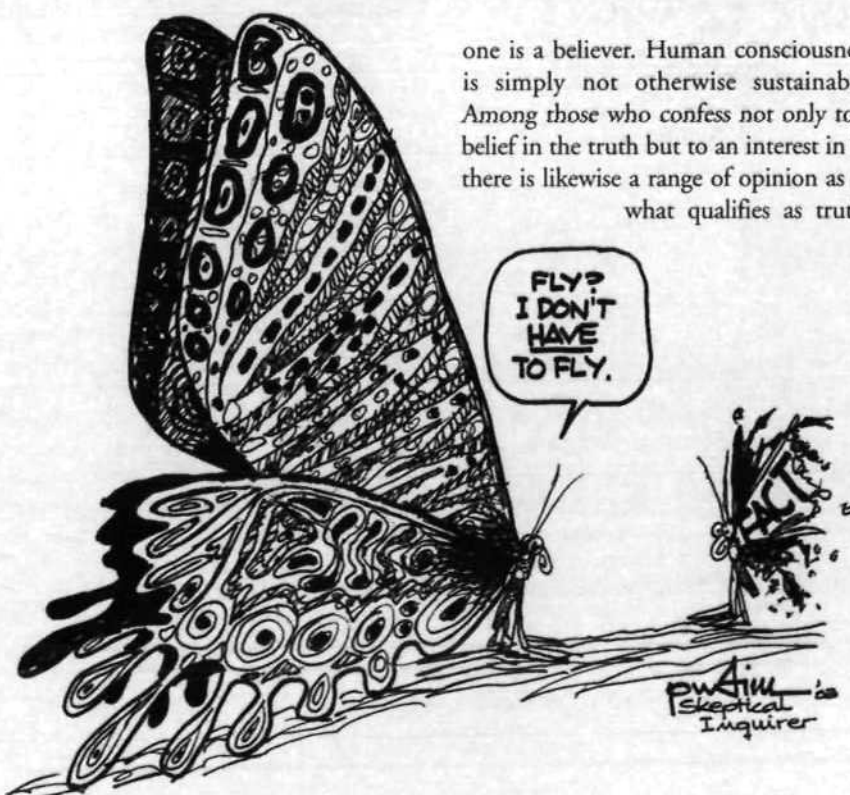
Among those who confess not only to a belief in the truth but to an interest in it, there is likewise a range of opinion as to what qualifies as truth.

You have your tough-minded types with stringent criteria—scientists, scholars, Missourians—and then you have those with looser requirements. Down toward this latter end of the spectrum are folks who are more than ordinarily apt to confuse the wish and the deed, the belief and the fact. Among these are those who buy most of the books that are found in the Self-Help and New Age sections of the bookstore.

To an observer with a little training in epistemology, these two groups of book-buyers might seem to be profoundly and permanently divided by their disagreement on a fundamental issue, the question of where the truth resides. The Self-Helpers are persuaded that *The Truth Lies Within*, while the New Agers are equally certain that *The Truth is Out There*. But while this is an issue for philosophers, it is not for these readers. It is a trivial distinction raised to a difference by the shelving conventions of bookstores.

These same observers with a little philosophy may recall that there is something called the Correspondence Theory of Truth, and something else called the Identity Theory, and a Coherence Theory, and a bunch of others. The Self-Helpers and New Agers show their true

one is a believer. Human consciousness is simply not otherwise sustainable. Among those who confess not only to a belief in the truth but to an interest in it, there is likewise a range of opinion as to what qualifies as truth.



Robert McHenry is a former editor in chief of the Encyclopædia Britannica. He has a longstanding interest in how we know things and why we believe that we do. His Web site is www.howtoknow.com.

solidarity in rejecting (more accurately, proceeding in happy ignorance of) these and the entire tradition they represent in favor of something much more congenial, something I am calling the Butterfly Theory of Truth. I take some liberties in calling it that, of course. The Butterfly Theory is not a theory in the sense that it consists of a set of related propositions, or that some theorist has set forth a systematic exposition and defense of it, including considerations of likely objections. Rather it is something like what John Dewey called a "theory in action," which is to say a summary inferred by an outside observer to rationalize the behavior of people who haven't spared the time to consider it themselves.

The central, unexpressed tenet of the Butterfly Theory is that the truth is ever-elusive. Like a butterfly, it flits from place to place, alighting perhaps for a moment here but then skittering over to there, never settling anywhere. It exists but can never be caught; it is glimpsed but never known. It is not even necessary that it have any content, that there be any *there* there. Its function is simply to beckon, like the maguffin in an Alfred Hitchcock movie. What makes the beckoning irresistible to multitudes follows from a second tenet of the theory, that the truth, whatever it may or may not be in substance, utterly charms. It is particolored and it shimmers; it is lovely to behold and even lovelier to imagine beholding.

So sublime is the charm of this sort of truth that each glimpse of it rewards and emboldens the beholder as powerfully as might actual possession of another, more robust sort of truth by a more skeptical sort of seeker. Those who succumb to this charm do so not merely willingly but eagerly.

My first intimations of this theory occurred when I was working in a used book store. While the chief trade of the store was in mysteries and westerns, there was a large cadre of regular customers who made beelines for the Self-Help and New Age sections of the store, each of which overflowed its assigned shelves onto the floor and into adjoining

areas. What became apparent only over the course of some months was that many of these customers were repeat customers in a highly regular way. Whereas

think, wouldn't you, that after the first dozen or so books failed to satisfy, these readers would reconsider their line of attack? But they didn't. Out in a single

The central, unexpressed tenet of the Butterfly Theory is that the truth is ever-elusive. Like a butterfly, it flits from place to place, alighting perhaps for a moment here but then skittering over to there, never settling anywhere.

someone looking for a copy of, say, *I is for Innocent* or *The Rider of Lost Creek* would find or ask for that title, buy it, and leave, the Self-Help and New Age people behaved differently. Often they hadn't any particular titles in mind when they came in. Rather, they browsed, sampled, and—and this is crucial—bought several books at a time. Not several books by a single author, developing and elaborating his thesis through successive volumes, like Dr. Weill or Madame Blavatsky, but quite diverse books, often with contradictory arguments. These regulars would come to the store with shopping bags of such books to sell us, and with the credit and a little extra cash would leave with a similar number of books from the same department but with very different claims. A week or three later they would repeat the process.

(As it happens, there are sufficient books in both genres to support this habit indefinitely. A corollary of the Butterfly Theory proposes that, while style is pleasant and novelty is always welcome, these books serve up a mixture of some fairly standardized elements, the goal being to occupy a certain amount of the reader's time. The writing itself is at best undistinguished and often verges upon the unintelligible. A great many persons have discovered in themselves a talent for this sort of writing.)

What were they seeking in these books, I asked myself. Whatever it was, they didn't seem to be finding it. You'd

shopping bag would go, and some time later back would come, a book on aromatherapy, two on healing relationships, a couple on addiction and enablement, some diets, cancer cures, and interpersonal astronomy; and then out would go more of the same or similar, only to return, over and over. Nary a hint was there ever of dissatisfaction, only gratitude that we had an exhaustless supply. And the same on the New Age side: this week something on alien abduction, a guide to numerology, job search by astrology, ancient Native American wisdom channeled through contemporary poets with meteorological names, Celtic lore, and practical witchcraft; next week, feng shui, shamanism, angels, magnetic vortices in Sedona, and more alien abduction. The Butterfly alights, and having alit, flits on.

In one jaded word that captures so much of the spirit of contemporary thought, *Whatever*. The Butterfly is not about specifics, or about reasonableness, or about evidence or factuality. The Butterfly is about promise and distraction, exoticism and ease. It is about idleness of mind, coupled with a degree of complacency unknown to those who are genuinely curious about the world. What is finally most annoying about these readers and their books is their habit, learned from certain academics, of referring to this complacency as a "way of knowing." It's just the opposite, of course, and—as Edith Anne used to say—that's the truth.

War, Music, and Evolution

SUSAN BURY

One recent morning, I awoke to the full-bodied horns of Aaron Copland's "Fanfare for the Common Man." The radio program host said Copland composed it at the time of World War II to honor ordinary Americans' contribution to the war effort.

most gruesome and devastating events?

As an armchair evolutionary psychologist (the most dangerous kind), I believe we love wartime music and other wartime cultural practices in part because war is what got us where we are today. It's a grim prospect, but the early human species that

result of Genghis Khan's military success. Even more provocatively, the researchers suggest that Genghis Khan himself had this particular version of the Y."

The main researcher on this project speculated that Genghis Khan's practice of slaughtering conquered people, especially men, "would have helped this form of the Y chromosome displace others. It's even possible that just Genghis Khan and his sons may have had enough offspring to account for the chromosome's unusually high prevalence today."

Other scientists quoted in the article said that directly attributing the Y prevalence to a single historical figure is a bit farfetched. Still, if a human population had it in their genetic makeup to be war-like, and those characteristics resulted in their spreading their seed in more places, wouldn't that genetic legacy become widespread?

Now, it doesn't work absolutely. That is, those who are more pacific also procreate. But an evolutionary perspective does help explain why warfare persists, generation after generation, despite the staggering human suffering and material destruction.

A recent *Baltimore Sun* feature (Shane 2003) reported a growing consensus among anthropologists and biologists "that war is not a product of civilization—of nations and economies and boundary lines—but has somehow been hardwired into the brain." Further, the article reports, warfare requires "the ability to dehumanize the enemy." To overcome what may be an equally inbred aversion to killing, said University of Maine anthropologist Paul B. Roscoe,

An evolutionary perspective does help explain why warfare persists, generation after generation, despite the staggering human suffering and material destruction.

As the medley of wartime music continued—the next number was a moving folk piece sung in Sarajevo during the Balkans conflict—I wondered about the enduring popularity of wartime songs. There are the stirring Sousa marches, melancholy classics like "I'll Be Home for Christmas," and more contemporary songs like "God Bless the USA." Music has captured the darker realities of war, from the Civil War-era "In the Hills of Shiloh" to the Gulf War-era hip-hop "Casualties of War" (Farley 2001).

We don't do this with other problems of humanity, do we? Are there ballads about cancer chemotherapy? Toe-tapping marches about child molestation? Zippy tunes about contaminated groundwater? Why do we have such a rich body of music about one of life's

proliferated were probably the ones that wiped out everybody else around them. Like all manifestations of evolution, there's no direction or design here. Simply by definition, the winners won.

More to the point, the winners replaced the losers with more winners like themselves, their influence penetrating throughout the conquered population, if you get my drift.

Science News ran a story in February (Travis 2003) about Genghis Khan, the Mongolian warrior of the early 1200s, who ultimately amassed an empire reaching from Afghanistan across China. "According to an international team of geneticists," the story reports, "about one in twelve men in Asia—and therefore one in 200 men worldwide—carry a form of the Y chromosome that originated in Mongolia nearly 1,000 years ago. Today's unusual prevalence of this chromosomal variant is most likely the

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"warriors will get together and kind of psych themselves up. They'll remember the dead from past conflicts. They'll chant. They'll take intoxicants."

And they'll sing.

No doubt, it's dismaying to realize that warfare is so deeply a part of our makeup that we'll never have "the war to end all wars." Those war songs touch a deep, dark chord. Yet, I consider myself better off for having this perspective on warfare. It makes my expectations of humanity more realistic. Accepting our common heritage as war-makers has got to result in better public policy than

simply pointing fingers at the other guy as the embodiment of evil or rolling our eyes heavenward and saying piously, "It's God's plan." (Or even worse: "God is on our side.")

Accepting evolution means we accept the less attractive parts of our genetic package. But we also realize that the package includes the capacity for understanding and perhaps modifying our own behavior. It's those better parts of the package—the intelligence, the ability to communicate and learn—that make it possible for us to assess the prospect of war in all its consequences.

If war is in our genetic makeup, we know from experience that so are diplomacy and peace. They may be more tedious and perhaps less emotionally gratifying than the decisive violence of war—and its compelling songs—but they are still within our grasp. That should be music to our ears.

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The Dancing Sasquatch and Other Mysteries

STEVE NADIS

After negotiating miles of icy roads in the rugged "Northeast Kingdom," my wife and I arrived in Greensboro, Vermont, late one night, ready for a rustic weekend in the country. We pulled into the secluded driveway of my friend Nick's house, unpacked our DVDs and other wilderness gear, settling in for what we hoped would be several days of concerted relaxation.

Before I had the chance to polish off my first martini, our host took me aside and murmured something about "some strange things..." I tried to ignore him, as Nick has a tendency to advance the most far-fetched explanations for ordi-

Steve Nadis lives in Cambridge, Massachusetts. When he's not tracking the elusive Sasquatch, he writes articles for Astronomy, Nature, Scientific American, and other magazines.

nary occurrences. He grabbed my arm and guided me to the sliding glass door. Turning on the floodlight, he pointed to several unusual footprints in the snow, all uncommonly large. "Bigfoot?" he said with a devilish grin.

I laughed, as we all did, at his crazy suggestion. The Bigfoot, or Sasquatch, was a mythic creature well-known in the Pacific Northwest—twelve feet tall, or so they say. With a shoe size of twenty or bigger, these outsized creatures would be hard-pressed to find appropriate outerwear even at a Big and Tall Men's Store. What would have brought them all the way to northern Vermont, and how would they have made the cross-country journey? Was there an unknown Northern Passage—the Sasquatch equivalent of the Lewis and Clark Trail—blazed, perhaps, by Bigfoot and Hupewaw or some such duo? Of course

not. The whole notion was preposterous. Still, I wondered as I peered beyond the patio, *something* made that impression in the snow, and if it was a foot, well, that was one very large foot.

Nick abruptly ushered me outside, through the snowdrifts, pointing to a trail of what looked like urine leading from the alleged prints. I was unimpressed. "Can we go back now?" I asked. "My drink is patient, but it won't wait forever."

I returned to my martini and easy chair, dimmed the lights, and popped in the first installment of the *Scream* trilogy. After two gruesome murders, things were looking up. I leaned back into the chair, just as my wife, Blinkie, begged me to join her on a midnight cross-country ski outing. "We'll go by the lake," she said. "It'll only take a minute." Skiing was the furthest thing from my mind, but I was reluctant to

have her clomping around in the woods alone, in the middle of the night, especially with hairy Sasquatches on the loose. And as we didn't have too many opportunities for such excursions in Boston, I turned off the TV, applied some wax to my skis, and followed her down the windy path to Caspian Lake.

Standing on the shore, we gazed at the snowy expanse, meditating under the slimmest of crescent moons. Then I saw it: a dark figure standing in the middle of the lake. Actually it wasn't standing but moving in a strange way as if spinning or dancing. Could it be a deranged human? A bear? Nah . . . too big, even for a grizzly, which certainly wouldn't be caught dead within a thousand miles of Vermont. Could it be, I was embarrassed even to think, a Dancing Sasquatch?

Blinkie saw it too, whatever "it" was.

"We should do something," she said. "Make sure he's all right."

"I'm not sure it is a 'he,'" I replied.

"Hello!" Blinkie yelled. "Anybody there?" There was no response, as might be expected in the middle of nowhere in the middle of the night with nobody around but us and the stars. I told her there was a perfectly logical explanation for all this, and once I figured it out, she'd be the first to know.

Even though I believed what I'd said about the "logical explanation," I still found the episode a bit unnerving. While completing the last stretch of our circuit through the woods, I couldn't get the image of that mad, gyrating figure out of my head.

First thing in the morning, I set out to deconstruct the myth—kill the beast, so to speak. I strapped on my skis and retraced our course. Finding our vantage point from the shore, I turned to the lake. In roughly the same spot I imagined

seeing the disco phantom, I saw an ice-fishing shack. Aha, so it was an optical illusion, just as I suspected. Something was dancing all right, but it was an ice house, not the stuff of legends. The way I figured it, photons had come intermittently under that pitch-black sky, causing the object to flicker, and that apparent motion sent our minds wandering down some pretty strange paths. In the light of day, however, the scene looked quite mundane.

So much for that mystery. But what of the giant footprints and urine trail? I dismissed that as a joke staged by Nick, a prankster credited with installing a giant breast on MIT's main dome during his undergraduate days. What's more, I knew for a fact he was not shy about micturating in public—a product, no doubt, of his European upbringing.

Later that night, while the rest of our party slept, I was suddenly gripped with terror. According to a rumor cited in *Variety* (yes, I try to keep up with the industry, despite living in Boston), more *Scream* sequels were in the works. This was shocking to me because the original production team had promised to

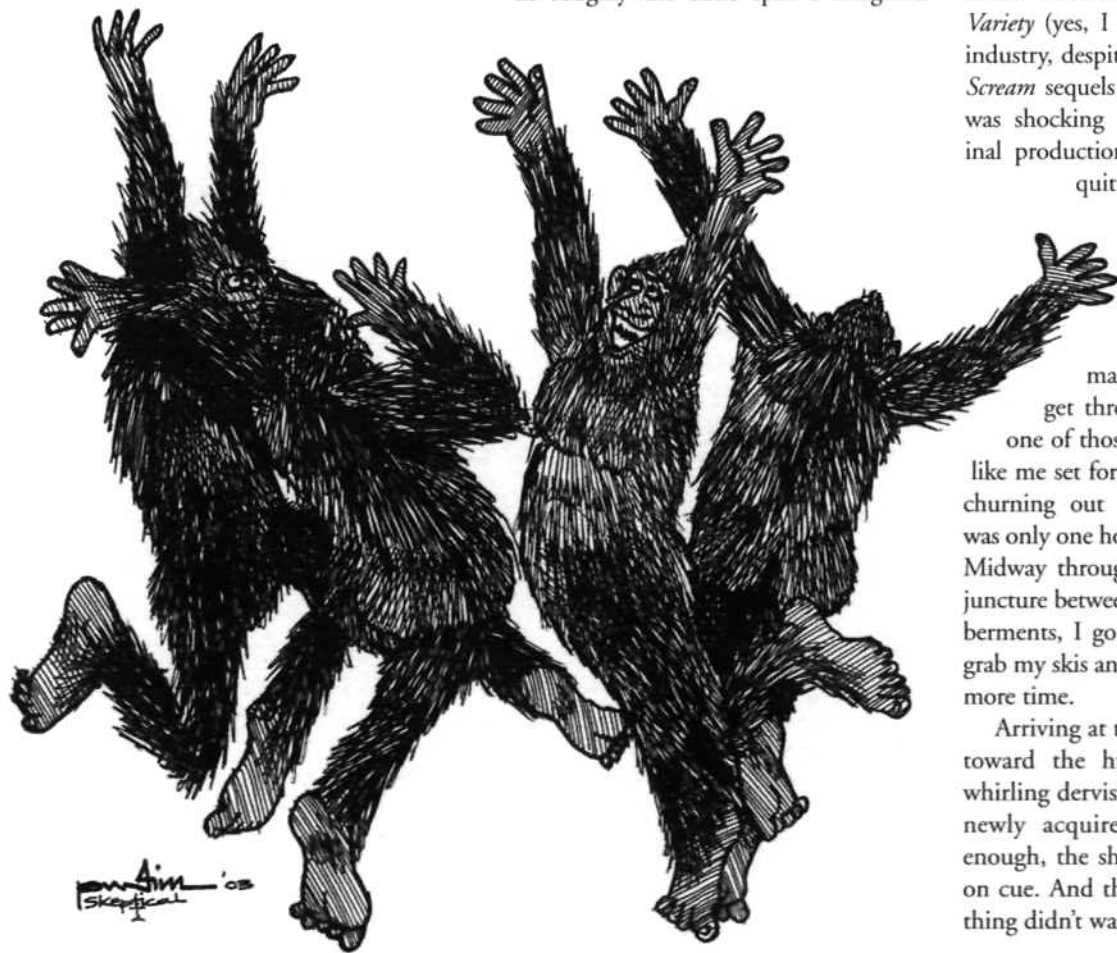
quit at three. Moreover, the

audience that made the first three movies a hit had moved on and were now refinancing their mortgages. My

main fear was that I'd never

get through the *Scream* series—one of those goals that overachievers like me set for themselves—if they kept churning out new installments. There was only one hope—to get cracking now. Midway through *Scream 2*, at a critical juncture between stabbings and dismemberments, I got the unexpected urge to grab my skis and glide atop the snow one more time.

Arriving at the lake's edge, I squinted toward the hut, trying to view the whirling dervish through the lens of my newly acquired understanding. Sure enough, the shack did a little jig, right on cue. And then I'll be damned if the thing didn't wave at me. □



Strong Response to Terrorism Not a Symptom of Fallacious Statistical Reasoning or Human Cognitive Limitations

The article "A Skeptical Look at September 11th: How We Can Defeat Terrorism by Reacting to It More Rationally" by Clark R. Chapman and Alan W. Harris (September/October 2002) continues to stimulate comment. We are not interested in provoking another round of letters (Readers Forum, January/February 2003; Letters, May/June 2003) but did think this commentary by CSICOP Fellow Steven Pinker worthy of publication. Following it, Chapman and Harris respond.—EDITOR

STEVEN PINKER

Chapman and Harris are right to question the costs in money, opportunities, and civil liberties of many of the policies adopted in response to the September 11 attacks. And they are right to call attention to

the vulnerability of the human mind to fallacies in statistical reasoning, as in people's overestimation of the dangers posed by air travel, shark attacks, and trace levels of carcinogens. But they are not correct in saying that the responses to the attacks are consequences of fallacious statistical reasoning. The classic experiments by Paul Slovic, Amos Tversky, and Daniel

Kahneman demonstrating those fallacies presupposes a number of conditions that are not met by the events of September 11, 2001.

First, since every event is unique, estimating risk requires one to define some class of events to be treated as equivalent, and then to compare the frequency of those events with the number of opportunities for such events to occur. For a singular event like the September 11 attacks, the equivalence class could be defined in many ways. If it is defined as "airplanes crashed into buildings," then the probability of the event multiplied by the number of deaths per event may indeed be smaller than other risks we tolerate. (Even then, one could question Clark and Harris's characterization of the casualty rates for events like September 11, because if

a few parameters had been different—the hour of the day, the time available for people to escape before the towers collapsed, the success of the passenger mutiny over Pennsylvania—the death toll could have been far higher.) But if one defines the class as "acts designed to inflict as many American deaths as possible"—which could include nuclear bombs simultaneously set off in New York, Los Angeles, and Chicago—then the multiplication gives a very different result, and taking expensive measures to prevent such events is not necessarily irrational. Similarly, one gets very different risk estimates for the class "anthrax attacks" (probably small) and the class "biological attacks, including smallpox" (possibly catastrophic).

In general, it is fairly straightforward to define an equivalence class for events with physical definitions such as plane crashes, shark attacks, and lung cancer deaths. But it is not at all straightforward to define the equivalence class for events such as terrorist attacks, which are limited only by the ideology, ingenuity, and resources of the perpetrators.

Steven Pinker is Peter de Florez Professor of Psychology in the Department of Brain and Cognitive Sciences at Massachusetts Institute of Technology in Cambridge, Massachusetts.



Prior to September 11, 2001, people had little reason to estimate that the equivalence class "terrorist attack" included massive destruction of American lives and landmarks brought about by well-funded suicidal fanatics exploiting hitherto unrecognized vulnerabilities of a technologically advanced democracy. The terrorist attacks provide new information relevant to estimating those unknowns.

Second, a probability estimate is specific to an interval of time in which the causal structure of the world remains unchanged. If the world has changed, all bets are off. If I notice that a nefarious character has just tampered with a slot machine, then ignoring the published odds is not fallacious. Or to take an example from the psychologist Gerd Gigerenzer, it would not be irrational to keep one's child out of a river that had no previous fatalities after hearing that a neighbor's child was attacked there by a crocodile that morning: there was no crocodile in the river before then, but now there is. For this reason one cannot

use the rate of major terrorist attacks in, say, the past ten years to estimate the rate in the next ten years. Wahabism and anti-Americanism may be more widespread, nuclear weapons more available, copycats more emboldened, and so on. Because of these uncertainties, anyone who claims to have calculated the mathematically correct probability that a horrendous terrorist attack will take place in the next year would be talking through his hat.

There is a third reason that terrorist attacks cannot be equated with the kinds of risks that people have been shown to treat irrationally. Nonhuman causes of deaths (such as sharks, airplane part failures, and carcinogens) don't take into account how people react to them. Human causes of deaths (such as terrorists) do. Bin Laden thought that American society was so decadent and spiritually bankrupt that a few easily inflicted humiliating blows would lead to its collapse. A public response of defiance and solidarity, and the implementa-

tion of extensive preventive security measures, could change such calculations in the minds of future terrorists. Similarly, if we calibrated our response to the anthrax attacks by cost-benefit comparisons to other risks, future bioterrorists could be emboldened to inflict exactly as many deaths as we decided we could endure. But pulling out all the stops to combat this new kind of threat, even if seemingly irrational on narrow actuarial grounds in the short run, could deter perpetrators in the long run, who would have to factor this determination into their own calculations. Another way of putting it is that dealing with terrorists is a problem in game theory, not just a problem in risk estimation.

I don't disagree with Chapman and Harris's opposition to some of the measures taken by the Bush administration and other authorities. But it is not correct to call the strong response to the September 11 attacks a symptom of fallacious statistical reasoning or human cognitive limitations.

Clark R. Chapman and Alan W. Harris Respond

Pinker's argument parallels comments by some other readers of our article who believe that "the barbarians are [or may be] at the gate." We did not pretend to calculate a "mathematically correct probability" of a future terrorist attack. Nevertheless, in order to face the future it is instructive to extrapolate from the past, making allowances as best we can for evolutionary developments—and occasional surprises. We examined statistical risks and

Chapman and Harris are research scientists with Southwest Research Institute in Boulder, Colorado.

human attitudes toward them to suggest that by our own overreactions we may be doing ourselves more damage than the terrorists are doing to us.

Recent polls show that about one-quarter of American respondents regard themselves as being *personally at risk* from terrorists. It is fair to note that with respect to the recent past, including the September 11, 2001, attacks, this perception is orders of magnitude off. Looking to the future, for this perception to be correct would require a World Trade Center-level terrorist attack somewhere in the U.S. roughly every week, for life. Lacking some realis-

tic expectation that the level of terrorism will soar by factors of thousands, we must ascribe this disparity to twisted perceptions—driven, of course, by news-inspired fears, as the terrorists intend—about the real dangers.

We don't agree that the terrorist attacks provided much new information about the willingness of terrorists to co-opt our modern technologies to kill and terrorize as many people as possible. Consider the 5,500 Japanese who were injured in the 1995 sarin attack in a Tokyo subway. Pinker claims that you can't use the major terrorist incidents of the last decade to predict those of the

next decade. Well, not exactly, of course. But the number of deaths in major terrorist incidents from 1983–1993 (2,544) aren't such a bad predictor of those from 1993–2003 (4,376). It may seem like a whole new world since September 11 to New Yorkers and President Bush, but not so much has changed from a global perspective (since the 1920s, twenty-eight other terrorist attacks have each killed more than 100 people). As throughout the history of warfare, aggressive and

defensive technologies will continue to improve; however, there is little basis, other than fear, for believing that terrorism (a technique of the weak in fighting the powerful) will emerge as a vastly greater risk to humanity.

It may be, as Pinker suggests, that "defiance and solidarity" will deter terrorists. That was surely President Bush's view before he attacked Iraq, though his critics believe the opposite. Perhaps a diminution of American arrogance in

the international arena, and examining and addressing the root causes of terrorism, would be more effective. Time will tell if Bush's approach worked or not. Meanwhile, it is imperative that Americans continue to ask themselves whether the terrorists' objectively modest attacks aren't succeeding beyond Osama bin Laden's wildest dreams through our capitulation to fear, which causes us to distort our national values and comportment in the world community. □

THE RORSCHACH INKBLOT TEST, FORTUNE TELLERS, AND COLD READING
from page 33

Listener: She was in a severe car accident when she was only eight.

Wizard: I think that may be it. She and people she loved were badly injured?

Listener: Yes.

As this example shows, the push can place the Rorschach wizard in a "win-win" situation. If the long-shot guess is correct—for example, the patient has actually been raped or assaulted—then the wizard's prediction may seem miraculously accurate. In contrast, if the guess is incorrect, the wizard can re-interpret it so that it seems "close"—or claim that the trauma occurred but that the patient has repressed the experience!

As Ray Hyman pointed out, a cold reader can be entirely sincere. Professional cold readers even have a term, "shut eyes," to describe individuals who engage in psychic cold reading while sincerely believing in their own paranormal powers. Similarly, most Rorschach wizards of the 1950s who used cold reading techniques probably genuinely believed in the test. When the wizards made certain statements about patients (for example, Barnum statements), they often met with the agreement and even astonishment of their listeners. When they made certain highly intuitive guesses about patients (actually, the push), they found that they were often "close" to the truth, and that their listeners were highly impressed. Reinforced by positive feedback from their colleagues, the wizards gradually became skilled cold readers, believing that their remarkable insights had arisen from the Rorschach.

The era of the Rorschach wizards belongs mainly to the past. Although skilled clinicians still occasionally dazzle graduate students with their stunning Rorschach performances, only a few psychologists today engage in public blind diag-

oses. But the legacy of the great wizards lives on. The aura of magic created in the 1940s and 1950s still lingers as the Rorschach mystique, the almost religious awe that many clinicians continue to display toward the test despite its tattered scientific status. Perhaps more important, the Rorschach wizards contributed to the belief—still strong among many clinical psychologists—that intuitions and clinical experience provide deeper insights than mere scientific knowledge can. Thus it is that clinicians still use the Rorschach for purposes for which it has no demonstrated usefulness, mistakenly believing that their supposed insights arise from the extraordinary powers of the test, rather than from their own unrecognized notions and preconceptions.

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The Blank Slate

I read the excerpt from Steven Pinker's *The Blank Slate: The Modern Denial of Human Nature* (March/April 2003) not merely with pleasure, but with some surprise. I had not realized that advocacy of human nature was still so politically incorrect. I had the great good fortune to attend a class given by Randy Thornhill at the University of New Mexico a few years ago, so the concepts that Pinker sets forth seem neither revolutionary nor uncomfortable. It is saddening to be reminded yet again how far outside the mainstream this kind of thinking is.

When the intelligentsia were forced to accept evolution, they were forced to accept our essential animality. Do you suppose that they needed some ideological lever with which to elevate themselves above the birds and beasts? The notion of the blank slate filled the void admirably. It's ironic that this new dogma, a notion that is supposed to elevate us, is by its nature a denial of our essential humanity. Thornhill often spoke of the molding of human nature during the era of evolutionary adaptation, when reproductive success was everything. Honest understanding of what we are, and why, is far more rewarding and hopeful than pious subscription to some pie-eyed belief in what we think we ought to be.

Robin Johnson
Albuquerque, New Mexico

Most of what Steven Pinker says about nature and nurture seems altogether reason-

able. However, it is important to bear in mind that many important aspects of this issue, as manifested in the various relevant disciplines, remain subject to debate (as I am sure Pinker would cheerfully admit). For instance, by no means all linguists accept that the language faculty is as "hard-wired" as has widely been proposed. Geoffrey Sampson's is perhaps the best-known of a set of very different alternative interpretations of the linguistic evidence.

Mark Newbrook
Linguistics, Monash University/
University of Sheffield
United Kingdom

I agree with Pinker's message, yet am surprised that he made no reference to E.O. Wilson. I have not read Pinker's book, so do not know if he mentions Wilson there, but reference to a pioneer of the ideas expressed by Pinker would seem appropriate.

As I recall, my first exposure to Wilson's ideas was from a piece in *BioScience* (1972). At first I thought that everyone should agree with what he said, but soon, to my surprise, there was a firestorm of protest. As anyone interested in this subject should know, Wilson spent much of the next thirty years successfully defending and developing his ideas.

Pinker says that some people think that the issues of nurture/nature make little difference, but he correctly maintains otherwise. I believe that Wilson, in *Consilience*, made that point very strongly by using the example of the two most totalitarian systems of the last century. They were based on the two extremes of this issue. One, Soviet Communism, operated on the assumption that people's nature could be totally controlled by the environment. The other, German Nazism, operated on the assumption that there are such extreme genetic differences among various groups that killing all the members of those "genetically defective" groups was justified. It seems that this is the strongest argument of all that what you believe on this subject is extremely important, yet Pinker makes no mention of Wilson.

John E. Hendrix
Emeritus Professor
Colorado State University
Fort Collins, Colorado

Steven Pinker replies:

The writer is correct that E.O. Wilson deserves credit for bringing these points to the attention of the larger public. I do bring him up in the

text of the book itself, though not in this particular excerpt.

A gnawing weakness in Pinker's SKEPTICAL INQUIRER article and in his book *The Blank Slate* is the absence of a working definition of "human nature." Pinker argues for scientific objectivity, yet nowhere does he provide a clear description of the concept of human nature per se except for anecdotes sprinkled throughout his article and book. Without an operational definition of this key concept, meaningful analysis of the blank slate assumption is difficult at best.

I am reminded of the early "sensory deprivation" studies which showed the crippling (though temporary) effects on intelligence of even short periods (24 hours) in which human volunteers lived in experimental chambers void of normal visual, auditory, and tactile stimulation. Where was their "human nature" when significant portions of the normal environment were removed? And then there is the work of Rosenzweig et al. (1972) published in *Scientific American* which showed that in rats' brain chemistry and structure were altered as a function of early experience. Yet if I asserted that "rat nature" should be acknowledged before emphasizing variations in behavior due to environmental experience alone, then I would *and should* be criticized for not defining "rat nature" explicitly.

An appendix at the end of Pinker's book includes "Donald E. Brown's List of Human Universals" (pp. 435-439). This list consists of over 350 traits such as "baby talk," "conflict," "semantics," "shame," etc., which, according to Brown, ethnographers cite as human surface traits. At best Pinker may be telling us that Brown's listing represents a conceptual net around which the concept of *human nature* may be located, yet such a transformation misses the essence of an operational definition.

William F. Vitulli
Emeritus Professor of Psychology
Department of Psychology
University of South Alabama
Mobile, Alabama

Steven Pinker's *The Blank Slate* pommels a straw man in asserting there is a "modern denial of human nature." While some renowned scholars, past and present, emphasize environmental influences on behavior, not even John Locke or B.F. Skinner denied influences of genes.

Meanwhile, relative influences of heredity and environment on many behaviors remain obscure. Unfortunately, that fact does not deter certain influential "hereditarians" from assailing "dumb" people. For example, *The Bell Curve* authors Richard Herrnstein and Charles Murray, "favorably" mentioned by Pinker, repeatedly use the terms "dumb" and "smart" in referring, respectively, to those who score low and high on tests of "cognitive ability." They pour out a torrent of statistics indicating crime, illegitimacy, child abuse, and a host of other social problems are *causally* related to cognitive ability as measured by standardized tests. One of their claims (p. 163) is that cognitive ability is a "... significant *determinant* [emphasis mine] of dropout from the labor force." That may be true. However, the only statement supported by their research is that certain measures of cognitive ability may help predict dropout. . . .

Richard Harger
Spokane, Washington

I would like to point out to Steven Pinker that it is quite possible to agree with the broad outlines of his Blank Slate theory—namely, that human behavior is shaped by both genetics and environment—and still disagree, vehemently and nontrivially, over any or all specific conclusions drawn by the theory's proponents about which behaviors are influenced by which factors, and to what degree.

For instance, Pinker states in his article that *The Bell Curve* has been vilified for its general thesis that some human traits (i.e., intelligence) are genetically influenced. I believe this assessment is far off the mark—*The Bell Curve* has been vilified for its defense of the specific thesis that intelligence is a race-linked genetic trait. The same is true for Pinker's book: *New Yorker* reviewer Louis Menand did a fine job of accepting *The Blank Slate's* overall "nature plus nurture" principle while still ripping into the book with a fiery passion (*New Yorker*, Nov. 25, 2002). I believe Pinker is seeing willful blindness to a solid scientific principle, when many of his critics are in fact presenting valid critical disagreement and anger with some of his specific conclusions.

Greta Christina
San Francisco, California

Acupuncture Science . . . Or Not

After reading Dr. George Ulett's article ("Acupuncture, Magic, and Make-Believe," March/April 2003), I am left with gnawing feelings of puzzlement. On the one hand I appreciate the author's attempts to provide historic perspective on acupuncture, the background on its introduction into the U.S., and its close relationship with the powerful placebo effect. But on the other hand I am perplexed how easily the same individual is able to switch from debunking in his words "an archaic procedure in which needles are inserted through the skin over imaginary channels in accord with rules developed from pre-scientific superstition and numerological beliefs" to supporting a so-called "scientific acupuncture," a method, again in his words, that "stimulates motor points and nerve junctures" and in which "specific electrical currents induce the gene expression of neurochemicals and activates brain areas important for healing," without producing a shred of evidence in the process.

Three references are provided at the end, none of which would qualify as peer-reviewed scientific literature. Obviously, the now-scientific acupuncture must be based on a wealth of articles that demonstrate the actual existence of the motor points and nerve junctures, their relationship to the release of neurochemicals and a plethora of well controlled, double-blind clinical studies that prove the value of this approach beyond any suspicion. If so, I seem to have trouble finding them, and I very much doubt they exist. Dr. Ulett would no doubt have prominently displayed them in the article since they would have provided instant credibility. Until I am able to actually inspect the "unicorn" of scientific evidence for acupuncture, ancient or modern, it remains, at least in my opinion, in the realm of magic and make-believe.

Roland Gerritsen van der
Hoop, M.D., Ph.D.
Roswell, Georgia

I'm sorry, but I'm afraid I was disappointed by George Ulett's article. There were a mere two paragraphs of findings, but little support for them, and I was left wondering if anybody has replicated any of them. We need more than just "Our own experience and reports from clinics abroad have shown. . . ." Would that be like reports from Tijuana laetrile clinics? Exactly what conditions responded, and with what level of uncertainty?

Having read the article, I have gained the vague notion that some investigators have reported it is efficacious and have offered more modern-sounding conceptual models of how it works—but no more convincing than the reports from free-energy machine inventors or dowsing-rod salesmen.

Mark T. Duigon
Stewartstown, Pennsylvania

In his article George Ulett debunks traditional Chinese beliefs about acupuncture, but he fails to apply the same degree of skepticism to his own beliefs. He advocates a new, evidence-based form of "acupuncture" involving no "acu" and no "puncture;" he stimulates the skin with electricity over putative motor points using EKG-type pads rather than needles. His article gives the impression that the efficacy and scientific basis of this therapy have been adequately established.

Although the experiments he describes are intriguing, they do not prove his case. His method is essentially a variation of the old TENS (transcutaneous electric nerve stimulation) method—itsself, an extension of historical attempts to interfere with pain sensation using electricity—which looked promising at first but has proven not very effective and is therefore not widely accepted.

Perhaps Dr. Ulett's technique causes a combination of placebo and nonspecific counterirritant effects. Yes, electrical stimulation may raise the levels of endorphins and dynorphins in spinal fluid, but what is the clinical relevance? Such neurochemicals have very short half-lives and can surely not be responsible for the long-term responses claimed for therapies that rely on such mechanisms of action. In addition, many non-specific stimuli, including exercise and placebo interventions, cause such elevations. Unfortunately, conclusions that his technique causes "healing actions" in the brain and spinal cord, "balances hormonal regulation by action of the pituitary gland" and "enhances homeostasis," simply cannot be justified based on current evidence.

In his book *The Biology of Acupuncture* Dr. Ulett describes a complex system of pad placement for various symptoms (using the traditional acupuncture points), yet he claims that acupuncture is frequency-specific and not point-specific. If this is true, why bother with specific pad placements? In fact, why bother with doctors? It would seem that anyone could self-treat with a home unit, placing the EKG pads on the hand and arm for symptoms in any part of the body.

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Ulett showed us that the emperor had no clothes, but has he re-clothed the emperor in another imaginary suit? Time will tell—good evidence will be persuasive.

Harriet Hall, M.D.
Puyallup, Washington

David W. Ramey, DVM
Glendale, California

George Ulett stripped away the rituals and mysticism surrounding acupuncture to reveal that the needles release the body's natural painkillers, the endorphins. These chemicals are also the mechanism underlying much of pain relief by aspirin. I prefer aspirin because they're cheap, easy to take, and are simpler to find at 2 A.M. than an acupuncturist.

Joel Kirschbaum
Hillsborough, New Jersey

George Ulett replies:

The concerns raised by readers of my article on acupuncture are reasonable. I too would like to see scientific studies on this subject conducted by scientists at U.S. medical schools. Unfortunately they have ignored such an approach. The Chinese government, however, is supportive of studies to modernize Chinese medicine whose theories were developed when our modern understanding of brain chemistry and physiology was not available. Dr. J.S. Han's large volume, referenced in my article, reviews in detail the many scientifically sound experiments conducted in his modern laboratory at Beijing Medical University. A reading of this material together with the report of recent fMRI studies by Professor Cho of UC-Irvine will best answer the questions raised. The evidence given there will support my contention that there is an evidence-based treatment derived from studies of acupuncture and that it has the potential, not just for brief pain amelioration, but for long-term favorable results in treating patients with chronic conditions.

Moon-Landing Deniers

As Baltimore's *Street Corner Astronomer*, for nearly sixteen years I have been offering members of the public glimpses of the moon, planets, and stars through an 8-inch telescope. What's the most often asked question I receive? "How much did that telescope cost?" But among my top dozen is, "Do you believe they really landed on the moon?" Having read James Oberg's "Lessons of the 'Fake Moon Flight' Myth" (March/April 2003), allow me to report on how I handle that question.

I respond as follows: "You know, it would be harder to fake it than to actually do it. To keep them quiet, they'd have to deep-six everybody who took part. How would they cover that up? Also, Congress appropriated \$20 billion to finance the moon flights. Where would it have disappeared to? Anyhow, if they faked it, wouldn't one moon landing have been enough? Why fake six of them?"

I don't know if I've converted any members of the hardcore moon landing hoax believers, but many times I've received knowing nods and comments such as, "Well, maybe you're right."

While I'm at it, on the UFO thing I tell them I believe there's plenty of life beyond Earth, but I don't believe there's any evidence we've been visited during recorded history. There are thousands of professional and amateur astronomers observing and photographing the entire sky every night in every wavelength from gamma and x-ray through radio. Many know the sky like the back of their hand. They discover comets, asteroids, quasars, pulsars, supernovae, planets orbiting other stars, and galaxies at the edge of the universe, but none have ever claimed to have discovered a UFO. It always seems to be people who can't tell a planet from a star or Venus from Mars who claim to have seen a UFO. Finally, when something is really up there, like an unusually bright meteor, even though it only lasts a few seconds, hundreds or thousands of people see it and, these days, some even videotape it. With UFOs it's usually just a single or a few observers. This explanation gets responses similar to my moon hoax one.

I invite SI readers to use these arguments the next time they encounter believers in the moon landing hoax or UFOs.

By the way, my second most often received question is, "Can you see the flag on the moon?" (it's too small for even the Hubble to detect!), which is encouraging because it suggests that the vast majority of the U.S. public really does believe we went to the moon!

Herman M. Heyn
Baltimore, Maryland

Whenever I hear that ridiculous claim that we never made it to the moon, I say this: The Russians were trying to land on the moon before we did (that's why they called it a Space Race). In fact, they tried to launch a spacecraft a few days before we were scheduled to go, but found they couldn't do it. If they were successful in launching, they cer-

tainly would have had the capability of tracking their own ship all the way to the moon and back. Given that capability, don't you think they would have tracked Apollo 11, as well as all our other missions, just to make sure we did it? If they discovered we didn't actually make it, don't you think they would have mentioned it to someone?

Of course we made it to the moon. If you don't believe me, just ask the Russians!

Peter Coster
Ashland, Virginia

'Taken'

Timothy Ferris's article in the March/April issue ("'Taken' Off") was both cogent and entertaining. I believe, however, that if he were to "check it out," he would find that John Mack is a psychiatrist, not a psychologist.

The highest academic degree, the Ph.D., requires a background in the philosophy of science and a demonstrated mastery of basic research methodology. Neither training nor education in scientific method is required for a doctorate in applied fields, e.g., law or medicine.

Therefore, no one should be surprised by eminent forensic experts who denounce the theory of evolution from the armchair, or by applied biologists who, lacking access to Occam's Razor, tangle speculation with anecdote to produce a Gordian knot of belief in abduction by extraterrestrials.

Robert T. Flint
Concord, California

Hey, Professor Ferris, nice article but remember "Taken" was on the *Science Fiction Channel*, not the *Science Channel*. SI stuff is on the *Science Channel*. We must not forget to read the labels even on the snake oil bottles. Great issue.

Lee Oldershaw
Marco Island, Florida

The James Ossuary

Regardless of the questionable authenticity of the ossuary purported to have contained the remains of the traditional disciple James, son of Joseph, brother of Jesus (popular media's translation), ("Bone [Box] of Contention: The James Ossuary" by Joe Nickell, March/April 2003) perhaps the most ignored element of the funerary vessel's curious

inscription is that of the inscription itself.

As Joe Nickell noted in the article, the literal transliteration of the text (I have taken the liberty to fine-tune this) is:

Ya'aqob bar Yosep 'ahuy Yesu'a



This would read, translated properly, as "Jacob, son of Joseph, brother of Joshua." Allow me to briefly explain.

The name *Jesus* is the Anglicized-Latinized-Hellenized form of the Aramaic form (*Yesu'a*) of Old Hebrew *Yehosua* which we read as *Joshua* in the Christian English-language Old Testament (recension notwithstanding). How *Ya'aqob* became "James" is somewhat more complicated (Greek *Iakobos* = Latin *Iacobus* = Old Italian *Giacobo* = Italian *Giacomo* = English *James*, omitting two or three steps). Thus "Jacob, son of Joseph, brother of Joshua" better approaches the translation consistent with the Anglicized Hebrew understood not only by scholars but by English-speakers of Jewish heritage. The media's translation is Christian embellishment.

It would, therefore, be equally as valid to translate said text,

Jake, son of Joe, brother of Josh

... or even

Hamish, son of Joey, brother of Jess

... depending on personal or collective predisposition. However, it is the only Jewish ossuary inscription that I've ever encountered which ever made a reference to the brother of the deceased. Though the Aramaicized names were common enough in Roman-Era Palestine during the First Century B.C.E.—First Century C.E. (also noteworthy), I'd be willing to wager that through the item itself seems genuine, the inscription is a fake.

And whether you call the deceased Jacob, Jimmy, Yaakov, Hamish, Jake or James, he certainly deserves better than that!

Another of many fine articles by Joe (*Yehosap*) Nickell.

Thomas L. Munden
Kapa'au, Hawaii

I have a fairly comprehensive Web page devoted to debunking the hoax theory for the moon landings, and in my experience a belief in conspiracies is the single most infallible sign of the crank. So when a writer argues for a hoax as the best explanation for a phenomenon without strong evidence, my pseudo-science detector goes into Red Alert Mode.

Jacob, Joseph, and Jesus (or Joshua) were common enough names in first-century Israel, so there could easily have been a number of people whose genealogy matched that on the alleged ossuary of James. Jesus Christ did not come from a prominent family, and the relic craze had not yet infected Christianity, so the odds are against the ossuary, even if it's genuine, being that of Christ's brother. Why would it have received any special preservation?

It bothers me when skeptics react with something close to panic at the notion that there could be physical relics connected with Jesus Christ. Their reasoning is almost identical with that of fundamentalists—they seem to believe that verifying any part of the Bible at all somehow proves the whole thing. Even if the ossuary is genuine and actually that of a relative of Jesus Christ, it proves only that three people mentioned in the New Testament actually existed, something that there's no particular reason to doubt anyway. So why muddy the water with accusations of a hoax over an artifact that, in the final analysis, doesn't tell us anything new at all?

Steven I. Dutch
Professor, Natural and
Applied Sciences
University of Wisconsin-
Green Bay
Green Bay, Wisconsin

Joe Nickell replies:

The letter of Thomas L. Munden is as intelligent and informative as that of the other writer is ill-formed and hostile. Having been consulted in many famous cases involving questioned documents and other artifacts, and having published extensively on the subject (including the book Detecting Forgery), I have to wonder at someone who equates finding evidence of possible forgery with offering crank conspiracy theories.

As to the suggestion that I may be panicky at the possibility of there being "physical relics" associated with "Jesus Christ," Professor Dutch's attempt at mind-reading has failed. In any case, while there have been numerous fake relics of Jesus (for example, at least thirty-nine of

some forty shrouds, including the "Fraud of Turin"), not a single one has been proven authentic.

Whether or not the James ossuary is an exception must be decided on the evidence, not on a dismissal of the evidence and ad hominem insinuations.

Meanwhile, a "very prominent" Israeli collector has come forward to allege that the ossuary had been offered to him a year before the Biblical Archaeology Review article. The inscription at that time, he stated, bore only the words "James son of Joseph."

Jack the Ripper

Regarding Joe Nickell's review of Patricia Cornwell's *Portrait of a Killer: Jack the Ripper Case Closed* (March/April 2003), he states that Cornwell begins her story of Walter Richard Sickert "without ever really explaining how she chose him." Actually on page 12 of her book she says that she was told about him by Scotland Yard's Deputy Assistant Commissioner John Grieve who said, "There's one other interesting chap. . . . An artist named Walter Sickert. . . . I've always wondered about him." This makes me think that she heard about Sickert from Grieve and not just that she started wondering about him after "flipping through a book of his art."

Tina Seeborg
Decatur, Alabama

Regarding Joe Nickell's review of Patricia Cornwell's "contribution" to Ripperology: After all the laudatory crapola about Cornwell's book, how refreshing to read an accurate piece.

While reading the book I was astonished that it managed to get published, much less get any press at all. One suspects that had Cornwell not been an established fiction writer, her Jack the Ripper book would never have found a legitimate publisher.

It's the most blatant example of begging the question I think I've ever seen. As Nickell so eloquently pointed out, Cornwell obviously arrived at her lame conclusion and then shopped for details. She found just enough ingredients to cook up a decidedly thin gruel.

I'm just glad I didn't pay full price for the book, although I paid 100 percent more than it was worth.

Tom Pantera
Fargo, North Dakota

Has anyone mentioned that Patricia Cornwell's central thesis about the Whitechapel murders borrows from a prior book entitled, *Jack the Ripper: The Final Solution* by the late Stephen Knight? I mean, give credit where credit is due.

Dan Riga
Burlington, Ontario
Canada

Once again Joe Nickell has done a good job on a tough subject. Barring a supreme stroke of luck (finding a diary in an old trunk in an attic, or something similar) the murders attributed to Jack the Ripper will never be solved. At this point they are about 115 years old and what evidence exists is more than cold. Like most people, I am curious as to the identity of Jack, although I am not entirely comfortable with smearing the reputations of men who are beyond defending themselves.

I find Cornwell's thesis unlikely. In addition to Nickell's criticism I would add another line of reasoning. As far as we know, the Ripper murders ceased in 1888 after two and a half months in which six women were murdered. In today's language, Jack sounds like a serial killer on a roll. Suddenly he stops and is apparently never heard from again. I am the first to admit that human beings are capable of doing unpredictable things. But a serial killer who suddenly voluntarily stops killing after two and a half months is rare, if not unheard of. I am forced to conclude that Jack either took his business on the road or immigrated. . . .

Phil Trice
(By e-mail)

Joe Nickell replies:

It's a pleasure to write for such alert and engaged readers. Regarding Tina Seborg's point, what I was referring to was not how Cornwell heard about Walter Sickert but why she decided to pick him from the proliferating lineup. Cornwell states (on the same page 12 Ms. Seborg cites), "I began to wonder about Sickert when I was flipping through a book of his art."

Dan Riga is correct that Stephen Knight previously accused Sickert of being the Ripper, but as part of a high-level government conspiracy involving a second killer and an accomplice. The main source was one "Joseph Sickert" who claimed to have been Sickert's illegitimate son. He later confessed that his conspiracy story was "a hoax; I made it all up," he said, but later retracted his confession. Although Corn-

well was not the first to accuse Sickert, she perhaps understandably did not want to bring up the "Joseph Sickert" silliness. She had enough of her own to offer.

Walt Whitman

Gary Sloan's article about Walt Whitman (March/April 2003) misses a pivotal element in Whitman's poetry and cosmology. Whitman certainly believed that life goes on beyond our individual endings, but he was a believer in recycling rather than reincarnation. His statement that "No doubt I have died myself ten thousand times before" is elucidated by an abundance of evidence of his belief in recycling. As "Song of Myself" ends, he writes, "I bequeath myself to the dirt to grow from the grass I love. If you want me again look for me under your boot-soles." In "This Compost," he tells of how the earth "gives such divine materials to men, and accepts such leavings from them at last." For Whitman, immortality lay in recycling. Other examples abound.

Sloan's accusation that Whitman "preyed on science" seems unduly fussy. It is a charge that, if allowed to stand, should also be leveled at Carl Sagan. Both Whitman and Sagan honored "positive science" and were able to find inherent beauty in it. That's not "preying" on science; it's a reasonable extension of science.

I also need to ask why Sloan and SI chose to critique a poet who never claimed to be a scientist, who has been gone for more than a century, and who despite a less than pristine scientific perspective gave American writing its most distinctive voice. He was a poet, not a faith healer, a medium, or a pseudoscientist. Lighten up, guys.

Jacob D. Stone
Doylestown, Pennsylvania

Gary Sloan replies:

In The Evolution of Walt Whitman, Roger Aselinau notes that Whitman's belief in reincarnation, expressed in such poems as "Faces" and "So Long," was intermittently reasserted. Whitman opined that "sooner or later all will be saved, for all the transfers [reincarnations] undergone by living beings are 'promotions.' Each being rises gradually in the hierarchy of the universe." Whitman did vacillate in his assessment of our post-mortem condition. "He hesitated," says Aselinau, "between the mystical concept of a dissolution in the Great All and the belief in personal survival. Sometimes

he distinguishes them, sometimes he confuses and reconciles them."

Carl Sagan cherished science. Whitman only pretended to. Even as he hurrahed science, he relegated it to inglorious handmaidens for mysticism. Whitman was indeed a poet, one of the best. Regrettably, he was also a poet of pseudoscience.



Something's Missing

I take great pleasure in being a subscriber to SKEPTICAL INQUIRER. I am also a great fan of Sherlock Holmes—which prompts me to comment on the introductory paragraph of the article "Omission Neglect" in the March/April 2003 issue. The recounting of the incident from "The Adventure of Silver Blaze" (not "The Silver Blaze") is inaccurate.

Sherlock Holmes did not ask Dr. Watson to consider the previous night's "curious incident" involving a dog. It was the local Inspector who asked Holmes, "Is there any other point to which you would wish to draw my attention?"

"To the curious incident of the dog in the night-time."

"The dog did nothing in the night-time."

"That was the curious incident," remarked Sherlock Holmes.

Perhaps the article's subtitle ought to be "The Importance of Missing Correct Information."

Lloyd S. Nelson
Londonderry, New Hampshire

Inconsolations of Philosophy

Ralph Estling, in "Inconsolations of Philosophy" (March/April 2003), managed to entangle himself in his very entertaining

prose and to come up with a philosophical mishmash of the very kind he disparages. Space prohibits me from defending fully the above assertion. The evidence is to be found in the essay itself.

Suffice it to say, however, that in the space of two pages Estling first dumps all French philosophies down a French toilet, and then ultimately reserves the same fate for all philosophy. He also informs us that the "fundamental and immutable truths . . . offer very little in the way of solace," a claim that presumably can only be made by the holder of those truths. A touch of humility would not be misplaced.

However, a grain of an important idea appears in the last few paragraphs, where he seems to be saying that we should replace philosophy with science. This deserves to be rephrased clearly lest it be lost: Science should stake as much of a claim into the ground of philosophy as it is possible to do without compromising its methods.

Stated in this form, the idea deserves a better defense than was offered in the essay. Such defense would include an historical perspective of how science answered a number of questions that were once thought to be the exclusive concern of philosophy and how in the process it brought some fresh air to replace the often hot air of philosophical debates. Cautionary tales of extrapolation beyond the point where the scientific method ends should also be included. Perhaps Estling will consider putting his admirable writing talent to use in such an endeavor.

Pantazis Mouroulis
Glendora, California

As a philosopher who for three years has written a column for *Physics World* entitled "Critical Point," which frequently broaches issues from competition to pseudoscience to whose clarification philosophical concepts are essential, I'm utterly baffled by your decision to publish "The Inconsolations of Philosophy," by Ralph Estling. The author knows zero about what philosophy is and does. He appears to lament its failure to provide a "philosophy of life"—but as Heidegger wittily said, that phrase has about as much meaning as "the botany of plants." What would you think about an article that attacked science as bogus for failing to cure the common cold and land a man on Jupiter, and whose idea of a scientist is somewhere between Michael Guillen and Ralph Nader? What motivated

you to publish an article whose righteously no-nothing [*sic*], anti-intellectual tone is so antithetical to every single value that your magazine says it stands for?

Robert P. Crease
rcrease@notes.cc.sunysb.edu

Ralph Estling replies:

Mike Nichols once said about lepers that there are good lepers and bad lepers. I believe there are good philosophers and bad philosophers but mostly bad ones, starting in the late eighteenth century with the German Idealists. The bad ones are bad because they do not seem to live in or care very much about this world, so what they think and philosophize over is likely to be not very relevant, except perhaps to other philosophers. But real, worthwhile thought should amount to something more than just taking in each other's laundry. I think it was Aldous Huxley who said that philosophy is what we do when we don't know what we are talking about and I'm fairly certain it was Wittgenstein who said that philosophy occurs when language goes on holiday. My own view, for what it's worth, is that philosophy occurs when people with intelligence don't know what to do with it and so invent word-games to fill in their time and thereby escape the otherwise maddening boredom of their existence. At least that seems to have been the case in the last 200 years or so.

By and large, philosophers of the last 200 or so years come in two shapes and sizes: those that hold up a hand in front of their face and say, "I see a hand," and those that hold up a hand in front of their face and say, "I see no hand." What is there to say about either of them? I think there is nothing to say about either of them. Nothing at all. Nothing.

As for the wit and humor of Martin Heidegger, when he was not acting as a defender of the Nazis he was telling us all about the Beingness of Nothingness, e.g., "This wholly Other to all entities is the Non-entity. But this Nothing essentializes as Being. . . . As historical, Beingness is possible only by reason of its temporality, and temporality temporizes itself in the ecstatico-horizontal unity of its raptures."

So there.

South Park!?

Wow! Am I surprised and skeptical! I was under the assumption that SKEPTICAL INQUIRER was an intellectual, sophisticated magazine with culture and class. Then I read Greg Martinez expounding on an episode of

"South Park" (News & Comment, March/April 2003), a real "boys will be boys" load of tripe that pollutes the media and one reason I won't turn on that appliance.

Vulgarity is rapidly replacing civility. In other words, we are returning to the grunt. I believe the more fashionable crude behavior and speech become, the more insidiously total invasion of privacy is invited.

It is hard for me to fathom that Greg Martinez would admit to sitting and watching insipid trash and then having a reputable magazine report his opinion. I am stunned. . . .

Margot Plummer
Golden, Colorado

South Park is an excellent resource for skeptical views—Martinez rightly praised episode 615—"The Biggest Douche in the Universe."

I can also recommend:

- Episode 407 "Cherokee Hair Tampons" (alternative medicine);
- Episodes 410/411 "Do the handicapped go to hell?/Probably" (religion and Pascal's wager);
- Episode 504 "The Super Best Friends" (conjuring and religion); and
- Episode 513 "Kenny dies" (stem cell research).

South Park has also dealt delicately with environmentalism, false abuse allegations, rainforests, sex education, freedom of speech and drugs. . . .

Peter Lucey
Berkshire
United Kingdom

Cobb County Clowns

William J. Hoyt, Jr., led readers astray with pies he threw ("Cobb Country Clowns Stage Another Pi Fight," March/April 2003). First, Peter Beckmann's *A History of Pi* informs that the pi bill failed the Indiana Senate and never became a law.

Creationists didn't mangle Darwin's book title. Rather, publishers are primarily responsible. A student might sensibly conclude *Origins* is title enough after repeated encounters with *An Abstract of an Essay on the Origin of Species by Means of Natural Selection*, Darwin's proposed title; *On the Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life*, John Murray's 1859 publication; *The Origin of Species & the*



Descent of Man (no dates), Random House's combined publication with Darwin's later book with *The Origin of Species by Means of Natural Selection or the Preservation of Favored Races in the Struggle for Life* on the title page and *The Origin of Species* on contents page; *Origin of Species*, a common reference; and *The Origin of Species*, popular 1979 Gramercy edition. This last is the exact words used by Georgia's Cobb County Board of Education mystifyingly objected to by Mr. Hoyt.

Students of Darwin might learn to distinguish facts (observations) from other notions. They might discover that the ambiguous word "species" isn't automatically singular. Come on, students and professors. Allow skepticism!

Daniel F. Baright
Lebanon, Missouri

William Hoyt attributes efforts to legislate pi to be 3 to a desire to make things simple. In a sense, he is right. The idea of the proposal is to bring mathematics in line with the Bible. Put yourself in the frame of mind of a Biblical literalist, read I Kings 7:23, and "do the math."

David P. Babcock
New York, New York

Evidence vs. Conclusions

I am puzzled and dismayed by Massimo Pigliucci's continued assertions that present scientific knowledge may be wrong.

First, we must distinguish between conclusions and evidentiary statements. The latter, including explanations of how evidence was obtained, are objective. But conclusions, at least insofar as they exceed restatements of evidence, are unavoidably to some extent subjective.

Pigliucci is merely repeating commonplaces if he is saying that conclusions must be to a degree tentative and that future evidence cannot presently be known. But we have no basis for saying that an evidentiary statement may be wrong unless and until contrary evidence is observed.

In his example in the March/April "Thinking about Science" column, air pressure affected whether electrical charge could be detected for cathode rays (electrons). Until that variable could be eliminated, the resulting statement could only be about the nature of the experiment, not about the nature of electrons.

Scientific investigation proceeds not by amassing conclusions but by accumulating incremental evidence, which is all that we can know. Conclusions, being not knowable in the same sense as evidence, perhaps should be excluded from empirical thought.

William S. Bunn
Algonac, Michigan

Massimo Pigliucci replies:

Bunn finds it puzzling that I assert that present scientific knowledge may be wrong. And yet this is a point on which all philosophers of science, and even most scientists in their most sober moments, surely would agree. The nature of scientific knowledge is tentative, and it is therefore perfectly possible that what we consider true today may turn out to be incorrect in the light of future evidence.

However, my column—which was largely presenting ideas discussed in much more detail in Peter Achinstein's The Book of Evidence—focused on the nature of evidence. Bunn claims that while scientific conclusions are tentative, evidentiary statements are objective, yet my point was not about objectivity (an interesting subject in its own right, and to which I intend to return in a future column), but about what criteria can be used to consider an experimental result or observation as evidence for a particular conclusion.

In the case of research on cathode rays, the early results were taken as evidence that electrons did not have charge, until that evidence was re-evaluated and shown to be insufficient to reach the conclusion. So, both conclusions and evidence are tentative.

Coin-Flip Odds Confusion

I am not a statistician either but surely Phil Mole ("Are Skeptics Cynical?", November/December 2002) was right and George Nagy

(Letters, March/April 2003) was wrong. But let us be charitable and assume that Nagy did not understand what Mole was saying. He was not saying that the probability of getting just one head from ten coin tosses is the same as that of getting five heads. He was saying that the probability of getting any particular sequence e.g., his series (1) is the same as that of getting any other particular sequence e.g., his series (2). Obviously there are only ten ways of getting just one head but 252 ways of getting five heads.

Brian Gibney
Sandy Hook, Connecticut

In response to George K. Nagy's letter on coin flip odds (March/April 2003), Nagy appears to have fallen into exactly the kind of incorrect reasoning that our common sense frequently leads. Phil Mole's article was describing odds based on an exact, pre-defined sequence of results. Nagy's application of the binomial coefficient would be correct if one were looking for the odds of getting any one result out of all possible with a 50/50 split as compared to the odds of getting any one result out of all possible with a 90/10 (for example).

By Nagy's reasoning, one would be wise to bet that out of the next ten flips, five would be tails and five heads, rather than betting that out of the next ten flips one would be heads and nine would be tails. This is correct, but that was not the point of Phil Mole's example.

Thad Engeling
Austin, Texas

While reading George K. Nagy's letter to the editor, I wondered how I, as an applied statistician, missed the apparently obvious failure by Phil Mole in neglecting the binomial formula when calculating the probabilities of given sequences of heads and tails in coin tosses in his article "Are Skeptics Cynical?"

But upon rereading Mole's article, I quickly realized that Mole and Nagy were using two different definitions of a sequence of heads and tails. Mole was calculating the probability of obtaining a very specific ordered sequence, while Nagy was not considering the order, just the number of heads and tails. Each was correct in his calculation, given his definition of the characteristics of the sequence.

This difference in interpretation relates very much to Massimo Pigliucci's article "Hypothesis Testing and the Nature of

"Skeptical Investigations" in the November/December 2002 issue. The proper interpretation of statistical probabilities is not easy and is dependent on the exact definitions of what is being observed. There are several statistical "paradoxes" arising from misdefinition of what is being observed. Among them is the so-called "Monty Hall Problem" popularized some years ago by Marilyn Vos Savant. Martin Gardner, commenting on an earlier version of the problem, observed that "in no other branch of mathematics is it so easy for experts to blunder as in probability theory."

Paul Kuckein
Los Altos, California

George Nagy's criticism of Phil Mole's article "Are Skeptics Cynical?" only shows that he didn't get the point. The human mind will focus at least as much on patterns as on number counts. I have no doubt that if the order of example (1) were to be rearranged so that heads and tails alternated, John Doe would estimate this to be a less than random sequence. Five heads followed by five tails would appear even less random.

The binomial formula calculates the probability of different heads/tails combinations. It doesn't calculate the probability of sequences within those combinations.

John Doe's estimates and George Nagy's four-decimal binomial calculations are both wrong. Every sequence of the same length is an equally probable permutation. Grouping these sequences into either patterns or counts of heads and tails is a construct of the mind. Once John Doe spots a pattern his focus narrows and he gives too much importance to its perceived improbability. The scientist partitions results into hits and misses and then might rush to publication when the null hypothesis is not supported. See Massimo Pigliucci's article on hypothesis testing in the same issue. . . .

Barry Zimmerman
Lake Mary, Florida

Deep Denial on Warming?

In his response to letters (March/April 2003, p. 70), Vojtech Mornstein appears to be in deep denial concerning global warming. He states: "I saw some temperature change plots which do not seem to differ from those measured in previous decades." I don't know which temperature plots he is

referring to but they certainly are not the global mean surface air temperatures published by NASA (www.giss.nasa.gov/data/update/). These data show that the last twenty-five to thirty years of temperature rise are absolutely unprecedented in the history of recorded climate data (and the rate of change continues to increase). He may be referring to the satellite data from the past thirty years but these are now hotly disputed as to validity and relevance.

Furthermore, and more importantly, the rise in CO₂ and other greenhouse gases in the past 100 years is also unprecedented (ice core data from Greenland and the Antarctic). The current level of CO₂ is now at the highest level it has been in the past 420,000 years (by 25 percent from previous highs) and possibly since the early Eocene over 50 million years ago. The fact that we are now adding about 18 billion tons of CO₂ to the atmosphere annually provides an undeniable strong human component to the observed temperature rise.

Bruce Bartleson
Gunnison, Colorado

Danish Committee Decision

Readers who wrote to complain about the treatment of Bjorn Lomborg's book *The Skeptical Environmentalist* (Letters, March/April 2003) might be interested in the decision by the Danish Committee on Scientific Dishonesty (an officially established group) upon their review of the book. They found that the book was "objectively speaking, deemed to fall within the concept of scientific dishonesty." Some social scientists have come to Lomborg's defense, claiming that it's okay to use data selectively as Lomborg has because selection of information is common in the social sciences and is important to develop theories in those fields. What limitations this places on their conclusions they don't say.

Bill Ferrell
Philomath, Oregon

Statistical Analyses

Richard Fisher (January/February 2003) explains the meaning of $p < 0.05$. He seems to imply that this means that you can show by statistical analysis that if you repeat the experiment 100 times you would be expected to get the same result ninety-five times. Wrong. It means that even if there

were no effect at all, you may get the same result five times out of 100 by plain luck.

Rarely one can say how often one can expect a repeat performance of the outcome of an experiment. . . .

Jan Willem Nienhuys
Dommelseweg, The Netherlands

(Earlier letters on this were published in our May/June issue.—ED.)

Science vs. Religion Firing

Here is a potential news story: I wrote an essay whose thesis is that science and religion are incompatible. The editor who published it has been *fired*. In the index which just came out, any reference to the essay and its follow-up do not appear.

Details: The essay, "Suicide Bombers and Their Deity," was published in Spring 2002 issue of *IEEE Technology and Society Magazine*, pp. 5, 6. The text appears as Essay #18 on my Web site, www.siddeutsch.org.

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Readers' responses were published in Fall 2002 issue, pp. 4-6; this text appears as Essay #21 on my Web site. The 2002 Index appears in the Spring 2003 issue.

Sid Deutsch
Sarasota, Florida

The letters column is a forum for views on matters raised in previous issues. **Letters should be no more than 225 words.** Due to the volume of letters not all can be published. Address letters to Letters to the Editor, SKEPTICAL INQUIRER. Send by mail to 944 Deer Dr. NE, Albuquerque, NM 87122; by fax to 505-828-2080; or by e-mail to letters@csicop.org (include name and address).



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The organizations listed above have aims similar to those of CSICOP but are independent and autonomous. Representatives of these organizations cannot speak on behalf of the CSICOP. Please send updates to Barry Karr, P.O. Box 703 Amherst NY 14226-0703.

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Auroras over Canada with the 200-million-year-old, 42-mile-wide Manicouagan impact crater in Quebec, Canada in the foreground.

Clouds and Earth's surface are illuminated by moonlight. This image was taken from the International Space Station (ISS) by astronaut Don Pettit, the ISS Expedition 6 science officer. "Here in

the same picture we have two interesting space phenomena: asteroid impact damage on the surface of Earth and auroras," noted Pettit. This photo was issued by NASA on March 24, 2003.

Image Credit: (NASA Johnson Space Center / Earth Sciences & Image Analysis)

Skeptical Inquirer

THE MAGAZINE FOR SCIENCE AND REASON

The Committee is a nonprofit scientific and educational organization.
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The Committee for the Scientific Investigation of Claims of the Paranormal encourages the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and disseminates factual information

about the results of such inquiries to the scientific community, the media, and the public. It also promotes science and scientific inquiry, critical thinking, science education, and the use of reason in examining important issues.

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