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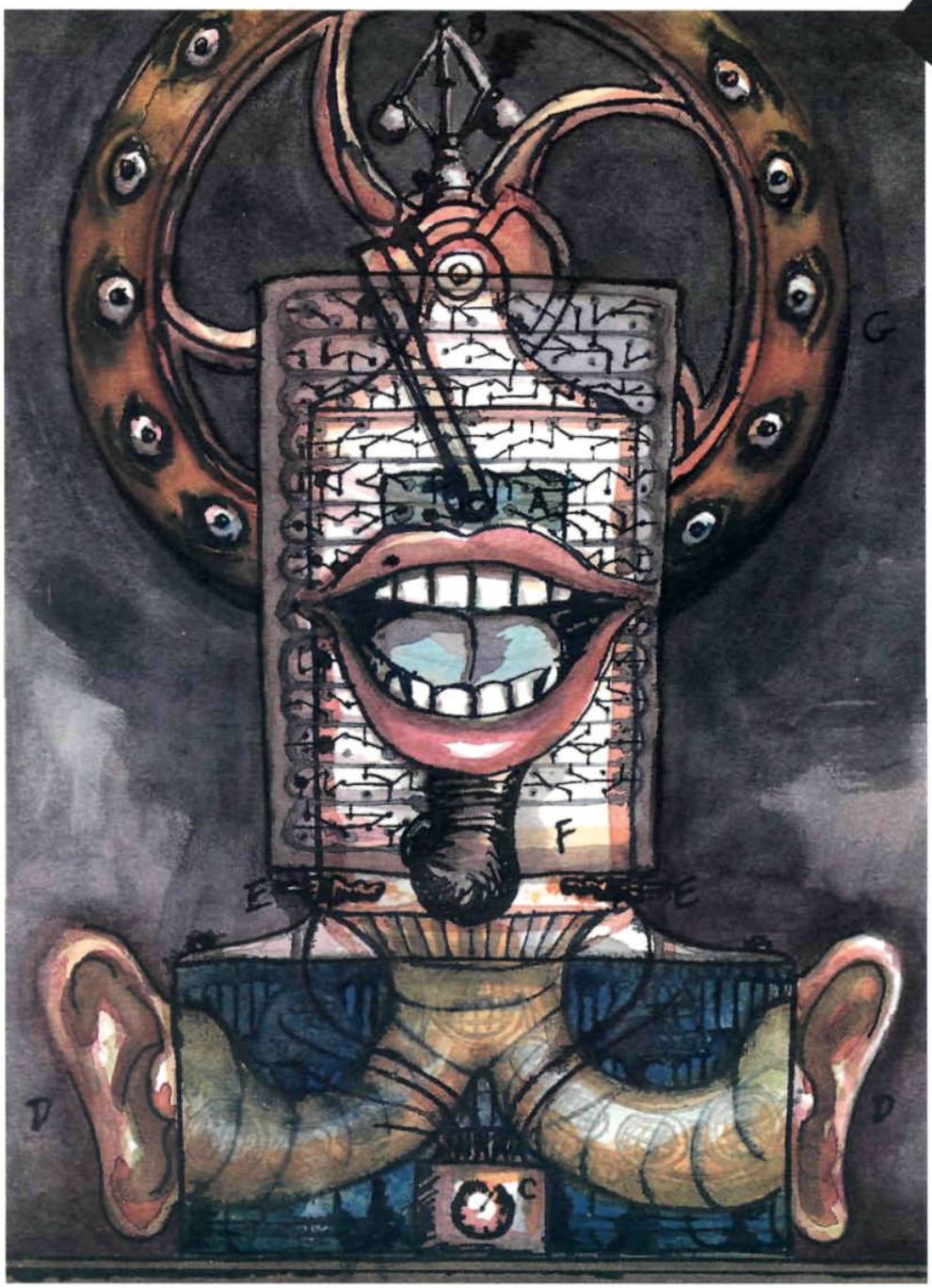

THE BELIEF ENGINE
JAMES E. ALCOCK

IS SKEPTICISM TENABLE?
JOHN BELOFF plus
SUSAN BLACKMORE, RAY HYMAN, PAUL KURTZ, JAMES ALCOCK, MARTIN GARDNER

CROP CIRCLE MANIA WANES
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A YOUNG GRAND CANYON?
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PUBLISHED BY THE COMMITTEE FOR THE SCIENTIFIC INVESTIGATION OF CLAIMS OF THE PARANORMAL

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Our brains and nervous systems constitute a belief-generating machine, a system that evolved to assure not truth, logic, and reason, but survival. The belief engine has seven major components.

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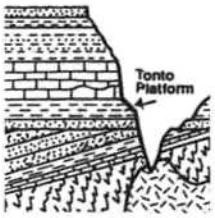

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Editor's Note

Why do we believe?

"How can anyone believe in (fill in the blank)?" Most of us have undoubtedly uttered a sentence like that more than once. But we must be careful. We all have our beliefs. It's a natural human tendency to think our *beliefs make sense, even if the other person's don't. How does this happen? Why are beliefs in all manner of things so strong, so prevalent, so enduring?*

Psychologist James E. Alcock examines that profound question in this issue. In "The Belief Engine," he shows how the brain and the nervous system constitute a belief-generating machine. In his useful metaphor, this machine has seven units—one of them is a learning unit and one is a critical-thinking unit. But there's also an emotional-response unit of at least equal importance to our survival. This machine generates beliefs to guide our lives and actions. The beliefs may have little relevance to what is true and real and what is not. Whether they are correct or erroneous, the beliefs it produces have value to the person holding them. Truth is not necessarily the most important of these considerations. In fact, as Alcock points out, the emotional-response unit has survival value to us that ensures it is passed on through natural selection. (The report on page 6 about a recent critical-thinking workshop makes some of the same points.)

This analysis helps us better understand ourselves and our fellow human beings. It helps us understand the great range and diversity of beliefs. I think it also should lend a measure of humility to all who might wish to think of themselves as systematically rational. We are all human, and we all generate beliefs with the same basic kind of "belief engine."

• • •

One subject about which people have strong beliefs is the paranormal. In this issue we present a series of exchanges concerning the skeptical viewpoint about parapsychology. John Beloff, a respected parapsychologist, initiates the discussion with a thoughtful article, "The Skeptical Position: Is It Tenable?"

We follow his article with responses by five notable critics of parapsychology —James Alcock, Susan Blackmore, Ray Hyman, Paul Kurtz, and Martin Gardner. We may have more on this matter in the future. We have invited Professor Beloff to respond to his critics, and we've asked several other prominent investigators for their views as well.

News and Comment

Academy Proposes Science Education Overhaul

A new direction for science education that places greater emphasis on "understanding" and less on "facts" has been proposed by the National Research Council, the operating arm of the National Academy of Sciences (NAS).

In a lengthy draft issued in early December of last year, the authors present ambitious standards that the document says are intended to "guide the science education system toward its goal of a scientifically literate citizenry." Included are comprehensive programs for all students—from kindergarten through twelfth grade—that call for the teaching of a broad range of key principles and concepts rather than just facts and equations.

Bruce Alberts, president of the academy, believes the traditional teaching methods of science are simply ineffective. "We fail to convey what science is, and we kill off the curiosity of kids," said Alberts.

To combat this, the document calls for greater participation of children in the learning process with less emphasis on memorization. Although this will involve a trade-off in the number of scientific "facts" a child can learn, the authors believe that this teaching approach will allow students to understand the "big ideas" of science.

The draft also proposes broadening the learning experience of the student to include what it calls "minds-on experience." This entails a shift from teachers presenting information to students learning science through inquiry-oriented investigations, interaction with peers, and active involvement in group discussions.

Richard Klausner, a senior cell biologist at the National Institutes of Health who chaired the committee responsible for the draft, said that the proposals are not an attempt to create federal standards and establish uniformity but are meant to be "grass-root standards for the people who make decisions [on education] at the local level."

The content standards in the document propose eight categories of study to be taught to all pupils of all ages. In life sciences for example, children in grades K through 4 should learn the "characteristics of organisms." Grades 5 through 8 are expected to learn about "reproduction and heredity" and "populations and ecosystems." Grades 9 through 12 should be taught about "the cell" and "biological evolution."

Other areas of study include science as inquiry, science and technology, and the history and nature of science. The standards are intended to be used in conjunction with all elements of the program and the draft warns that "the standards cannot be used effectively if only a subset of these standards is used . . . ."

Around 30,000 copies of the draft are being circulated as part of an extensive consultation process. Recipients are asked to complete a review and comment form that rates the document and its individual sections on clarity, consistency, and appropriateness. According to Angelo Collins, director of the science education standards project staff, 1,400 individual reviews and 120 group reviews had been returned as of March 3.

—Tom Genoni, Jr.

Four 'Bottom Lines' Concerning Science Education

- Science should become a core subject like reading, writing, and math in grades K through 12.
- At all levels the material taught should be interesting to both students and teachers.
- Science teaching must become attractive as a profession that is possible to do without superhuman effort.
- The scientific community must accept responsibility for achieving these three goals.

—Bruce Alberts, President, National Academy of Sciences, at American Association for the Advancement of Science annual meeting, Atlanta, Feb. 19, 1995

The Geller Case Ends: 'Psychic' Begins Court-Ordered Payment of Up to $120,000 to CSICOP

The four-year legal battle is finally over. Self-proclaimed "psychic" Uri Geller has paid the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) the first $40,000 of up to $120,000 as part of a settlement agreement to a court-described "frivolous complaint" made by Geller against CSICOP. CSICOP announced the court settlement and first payments by Geller March 6.

The settlement ends a lengthy battle in the Washington, D.C., courts that began with Geller filing a $15-million suit against CSICOP and magician James ("The Amazing") Randi, alleging defamation, invasion of privacy, and tortious interference with prospective advantage. Geller filed suit because Randi had stated in an April 9, 1991, interview with the *International*

Herald Tribune that Geller had "tricked even reputable scientists" with tricks that "are the kind that used to be on the back of cereal boxes when I was a kid. Apparently scientists don't eat cornflakes anymore."

CSICOP, a not-for-profit scientific and educational organization dedicated, in part, to investigating claims of psychic phenomena, such as those made by Geller, was not charged with any specific conduct. CSICOP maintained throughout that the suit was a frivolous action brought by Geller to harass the organization. On July 27, 1993, the U.S. District Court in Washington, D.C., ruled in favor of CSICOP and ordered almost $150,000 in sanctions against Geller.

In efforts to overturn the sanctions award, Geller then lost two motions for reconsideration in the District Court, followed by a 3-0 loss in the U.S. Court of Appeals on December 9, 1994 (*SI*, March-April 1995), and most recently another loss in the appeals court when his petition for rehearing was denied on January 25, 1995.

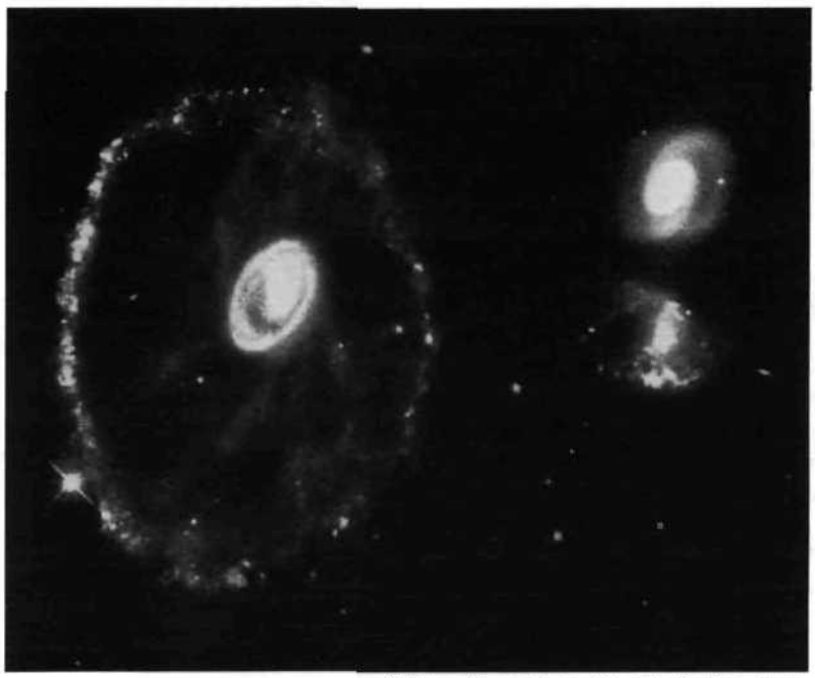
The settlement agreement calls for Geller to pay CSICOP $70,000 in cash over three years plus the first $50,000 of any sums recovered by Geller in a new action he is bringing against his former attorneys. In addition, Geller must also drop another suit against book publisher Prometheus Books and other skeptics filed in London, England.

In an earlier suit that Geller had brought against Prometheus Books, Victor Stenger, and Paul Kurtz, in Miami, Florida, Geller was compelled by the court to pay Prometheus Books an additional $20,000 in legal fees.

"Although we settled for somewhat less than the entire $150,000 awarded to us as sanctions for the frivolous suit," commented Barry Karr, CSICOP executive director, "we are very pleased with this victory. Prior to filing suit, Geller, an Israeli citizen living in England, placed his assets in trust, rendering uncertain our ability to collect. Instead of spending thousands more in legal fees to pierce the trust in London, we decided it was best to end it now."

Paul Kurtz, CSICOP chairman, said: "When the principles upon which CSICOP was founded are at stake, we are prepared to do battle all the way if it should prove necessary. We believe deeply in a free press, freedom of speech, and scientific inquiry, and the importance of dissent." He characterized the Geller suit as the "kind of suit being used as a means of silencing debate on significant scientific issues."

—Barry Karr



Kirk Borne (Space Telescope Science Institute) and NASA.

New Eye on Nature

A rare and spectacular head-on collision between two galaxies appears in this NASA Hubble Space Telescope image of the Cartwheel Galaxy, located 500 million light-years away in the constellation Sculptor. The new details of star birth resolved by Hubble provide an opportunity to study how extremely massive stars are born in large fragmented gas clouds.

The striking ringlike feature is a direct result of a smaller intruder galaxy—possibly one of two objects to the right of the ring—that careened through the core of the host galaxy. Like a rock tossed into a lake, the collision sent a ripple of energy into space, plowing gas and dust in front of it. Expanding at 200,000 miles an hour, this cosmic "tsunami" leaves in its wake a firestorm of new star creation. Hubble resolves bright knots that are gigantic clusters of newborn stars and *immense loops and bubbles blown into space by exploding stars (supernovae)* going off like a string of firecrackers.

The Cartwheel Galaxy presumably was a normal spiral galaxy like our Milky Way before the collision. This spiral structure is beginning to re-emerge, as seen in the faint arms or "spokes" between the outer ring and bull's-eye shaped nucleus. The ring contains at least several billion new stars that would not normally have been created in such a short time span and is so large (150,000 light-years across) our entire Milky Way Galaxy would fit inside.

Hubble's new view does not solve the mystery as to which of the two small galaxies at the right might have been the intruder. The lower galaxy of the two is disrupted and has new star formation, which strongly suggests it is the interloper. However, the smoother-looking companion has no gas, which is consistent with the idea that gas was stripped out of it during passage through the Cartwheel Galaxy. This image was taken October 16, 1994, and issued January 10, 1995.

Update

In the March-April issue we reprinted excerpts of the recent District of Columbia Court of Appeals decision in Uri Geller vs. James Randi and CSICOP.

On March 2, 1995, a court order was issued notifying all those involved of changes in the text:

"It is ordered, by the Court, that the opinion filed on December 9, 1994 is amended, as follows:

"*On page 5, Last line of first paragraph* Delete the word 'exposing' and substitute therefor 'attempting to expose.'"

'X-Files' Coriolis Error Leaves Viewers Wondering

Was it an honest mistake, or was it a deliberate attempt to spook viewers?

The January 27 episode of the ever-ominous series "The X-Files" (see Media Watch review, *SI*, March-April 1995) had FBI agents Fox Mulder and Dana Scully probing a ritual murder in a small New Hampshire town where the residents had the eerie feeling that a malevolent presence lurked.

At one point, a thirsty Mulder turns on a water fountain in the local school and stares at the draining water in amazement.

"The water," he says.

"What's wrong with it?" Scully asks.

"It's going down the drain counterclockwise," Mulder responds. "The Coriolis force in the Northern Hemisphere dictates that it should go down clockwise."

"That isn't possible," Scully says.

"Something is here, Scully," says Mulder, suddenly convinced that a supernatural force permeates the town. "Something is making these things possible."

There's only one problem: the supposedly brilliant Mulder and Scully (a physician with an undergraduate degree in physics) got it wrong.

All things being equal, water going down the drain in the Northern Hemisphere is *supposed* to spin counterclockwise. Under less than ideal conditions, the shape of the sink or the original flow of the water can easily overpower the Coriolis force, which is caused by the rotation of the earth.

(The water drains the way a tornado—and a hurricane—spins, which is counterclockwise north of the Equator and clockwise to the south.)

This wouldn't be the first time the show's writers have gotten their scientific facts wrong, especially involving cases of paranormal phenomena.

But in this case, were the people behind the show intentionally giving the wrong information in a mischievous attempt to spook plumbing-conscious viewers into believing that their neighborhoods are also permeated by supernatural forces?

Attempts to contact the writers through the show's publicist were unsuccessful.

If nothing else, the Coriolis reference generated some viewer interest.

On the Internet forum alt.tv.x-files.creative, a fan in Vancouver, B.C., asked if Mulder's reference was scientifically accurate.

"The reason I ask is that, as expected, out of pure curiosity, I immediately checked the two sinks in my apartment, and much to my surprise both drained counterclockwise," the viewer wrote.

It shows why Fox Mulder deserves his nickname of "Spooky."

—*C. Eugene Emery, Jr.*

Gene Emery is the science writer for the Providence Journal, *75 Fountain St., Providence, RI 02902.*

A Letter from the Editor to Ann Landers

Ann Landers
P.O. Box 11562
Chicago, IL 60611-0562

February 10, 1995

Dear Ms. Landers:

Last month you again published a letter about "eerie similarities" in the lives of assassinated Presidents Lincoln and Kennedy.

To my chagrin I realized—and one of our mutual readers, R. Thomas Myers of Kent, Ohio, reminded me—we apparently had never sent you the "Spooky Presidential Coincidences Contest" we ran in our magazine several years ago. I meant to do so because we thought it was both educational and entertaining.

Our contest was conceived specifically in response to your reprinting "for the zillionth time," according to our contest originator John Leavy of the University of Texas, those Lincoln-Kennedy coincidences.

Page C22, Saturday, January 14, 1995

Advice

Eerie similarities between Lincoln and Kennedy

The SKEPTICAL INQUIRER—now subtitled The Magazine for Science and Reason—promotes science and scientific inquiry, critical thinking, and the use of reason in examining important issues. We publish scientific evaluations of a wide variety of bizarre claims in an attempt to help educate people about how there often are perfectly normal explanations for them.

Leavy and his colleagues proposed a contest to show how easy it was to come up with equally amazing-sounding coincidences between other pairs of Presidents. In "Our Spooky Presidential Coincidences Contest" (SKEPTICAL INQUIRER, Spring 1992), they offered many such examples: McKinley/Garfield, Polk/Carter, Lincoln/Jackson, Madison/Wilson, Washington/Eisenhower, etc. We received many responses to our contest and published the offerings of the two winners in our Winter 1993 issue (published in December 1992). Here they are, again for your edification and amusement.

The point is that it is amazingly easy to come up with "amazing" coincidences. There are millions of variables in the life of every person. When we're given the latitude to select from among any of them, and then compare two people, it's almost inevitable that we can come up with a list that at first seems quite extraordinary, but in fact should be quite expected.

I hope you will enjoy our contest entries, and if you feel you have the occasion to share any of this with your readers, all the better.

Respectfully,

Kendrick Frazier, Editor
SKEPTICAL INQUIRER

On Leaping and Looking and Critical Thinking

Boulder Critical Thinking Workshop

J. P. McLAUGHLIN

There couldn't have been a more appropriate locale for a meeting of skeptics last August in Boulder, Colorado—a theater of science where the only stars are the stars.

About 80 of us gathered in Fiske Planetarium on the University of Colorado campus for the CSICOP Workshop on Critical Thinking, a four-day conference that took apart the phenomenon of human thinking from the standpoints of evolution, psychology, and pathology.

An even simpler theme of the workshop may have been "Look Before You Leap," a warning that echoed and re-echoed across the black-domed planetarium many times during the four days.

Along the way, our hosts presented a laundry list of perceptual weaknesses to which the brain is heir—sessions with titles that included: "Illusions and Distortions of Thinking," "Anomalous Thinking and the Brain," "Rationality and Human Error," and "Coming to the Wrong Conclusion for the Right Reasons."

Workshop leaders in our journey through the brain were Ray Hyman, a cognitive psychologist from the University of Oregon; Barry Beyerstein, a physiological psychologist from Simon Fraser University in Vancouver, B.C.; Loren Pankratz, a psychologist from Oregon Health Sciences University, who is an expert on Munchhausen syndrome; and Jerry Andrus, an illusionist from Oregon who specializes in "up-close magic" and sage observations on the human condition. Hyman and Beyerstein serve on CSICOP's Executive Council.

Those attending the workshop ranged from a FermiLab physicist to a homemaker, a preschool teacher to several college professors, a substitute teacher to a salesman ("We need promotion. Where are the TV cameras?), computer specialists to psychologists, a former fundamentalist preacher racked by doubts, an antireligion proselytizer, and a journalist.

An 18-page syllabus was given to workshop participants. Its first few pages brought us up to date on the latest, best evidence about thinking: "Thinking, as classically conceived, will not by itself result in better conclusions, solutions, arguments or ideas. Thinking, to be successful, requires good and reliable information"—i.e., garbage in, garbage out, no matter how sophisticated and powerful the computer.

Most of the syllabus was devoted to more than 40 mind-bending problems, all illustrating how thinking can go wrong, how the brain can be fooled. Conferees were asked on the first day to work the problems that evening. Then, a day or more of the workshop was devoted to showing us the mental traps many fall into when trying to solve them.

(The simplest and most egregious example: How many animals of each kind did Moses take on the ark? Look twice before you leap.)

Our four leaders all touched on the evolutionary aspects of thinking, how brain evolution, in its pragmatic way, causes us to leap before we look. For survival, it is indeed better to be safe than sorry.

"Evolution leads us to jump to conclusions—it is functional to survival but not necessarily the best way," Beyerstein said. "Evolution provided that 'seeing is believing,' which is usually good enough to save our skins. If we see a tiger appearing to get bigger, we assume it's moving toward us and run like hell," he added.

Hyman noted that "the brain evolved before the agricultural revolution—the problems in the syllabus aren't the problems of small bands of hunter-gatherers."

Beyerstein also laid our lack of objectivity in thinking at evolution's doorstep: "We always come up short of evaluating our lives objectively because hope is an evolutionary advantage."

In other words, survival depends on believing that you're right, which most humans seem to do regardless of evidence—a fact addressed by workshop

leaders as they compared "true believers" with skeptics.

"Believers are not interested in truth; they are comforted by their beliefs," Hyman said.

Beyerstein said, "Skeptics don't feel threatened by the lack of answers to metaphysical questions, but believers fear being pawns of the universe."

Beyerstein also pointed out that in perceptual breakdowns, "believing is seeing"—people sometimes see what they want. "The brain makes up a story about what you see," he said.

Andrus said those who question their faith may find reasons to abandon it. "That's why faith is largely unexamined," he said.

So, where does thinking come in? Hyman made it clear at the outset that he believes critical thinking can be taught. Based on his classes in thinking and cognition, he has come to two conclusions about students and people in general:

- "They can think, but they don't want to. It's hard work."
- "The process is the least important part. Having good data is most important, but finding good data is tough. You need tools to get it."

Hyman said that in the 1960s "I read all the books on improving thinking, wrote down all the ideas I could find, and discovered 695 principles. I boiled them down to a small group of principles, looked for psychological studies backing them, then boiled them further down to only three." They are:

- Look before you leap (know the facts before you reach a conclusion).
- Break out of the rut into which thinking falls.
- Always check your answers.

To sharpen their thinking skills, Hyman challenges his students with problems they must examine with a Socratic tool he has developed. Hyman said he asks his students a series of questions, forcing them not only to analyze the problem but to organize their analysis:

- What's the question or issue?
- What is the claim? (If what, then what?)
- What arguments and evidence are offered in support of the claim?
- How good is the support?
- What would constitute adequate support?
- What alternative reasons might there be for believing such claims, i.e., why do people believe them?

One problem Hyman gives his students (and included in the syllabus) is an anecdote from a book touting the "amazing skill" of dowsing. It tells of a famous dowser who, while on naval reserve duty as a young man, was forced by his disbelieving fellow officers to demonstrate his abilities. Tired of his proselytizing about his dowsing skills, they decided to hide his paycheck and make him find it with his dowsing rod—which, of course, he did, according to the story.

Hyman said that after he walks his students through his series of questions, they discover how thin the evidence is supporting the claim for dowsing success and what kind of controlled tests would be required to prove that it is a real skill.

Working through problems like this in a fixed framework demonstrates that students *can* think if pushed, he said. If they are forced to go through the steps, they come to the right conclusion, discovering the unreliability of testimony and learning the necessity for double blinds and controls to validate tests.

During the conference, workshop leaders were careful to distinguish between skepticism and cynicism.

Andrus noted that the word *skeptic* has a bad connotation: "It's often equated with 'cynic,' but I call skepticism the 'cult of common sense.'"

The workshop's definitions of the terms: *skeptic:* one who demands reasonable evidence and logical justification before granting provisional assent to claims of truth (most important, a skeptic will modify beliefs based on new evidence); *cynic:* one who consistently attributes base motives to others' actions.

The bottom line of the conference leaders, laid out in their principles of skepticism and minimum rules of observation and testing (see box "Principles of Skepticism"), is the scientific method of gathering and assessing information.

As Beyerstein noted, "We need controlled, quantitative observation to protect us from the fallibility of the human cognitive process."

The first principle of skepticism was set down in the eighteenth century by the English philosopher David Hume and popularized in recent years by Carl Sagan and others: Extraordinary claims require extraordinary evidence.

In that spirit of rationality, we have the means to overcome our weaknesses in perception and thinking. If we begin demanding solid evidence for claims of truth, we can put behind us the often deadly game of leaping without looking. □

Principles of Skepticism

- Extraordinary claims demand extraordinary proof.
- The burden of proof lies with the claimant; it is not the skeptic's job to prove a claimant right or wrong.
- Claims, in principle, must be testable (which eliminates metaphysical claims).
- The evidence must be public and accessible to all competent critics.

Testing must include:

- Adequate control groups.
- "Blind" rating procedures.
- Public methods and data.
- Replicability of results by any competent, well-equipped critic (one study, even if well done, is not enough).

J. P. McLaughlin is a veteran newspaper and magazine writer and editor who now teaches journalism at Metropolitan State College of Denver. He wonders why more journalists don't attend CSICOP workshops, since critical thinking is as vital in their field as in science. He intends to incorporate classes on critical thinking into his college's journalism curriculum.

Center for Inquiry Grand Opening.

"Defending Reason in an Irrational World"

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Thanks to the extraordinary generosity of our readers and supporters, the Price of Reason Campaign is precisely on target. The Center for Inquiry, Phase II—new joint headquarters of the SKEPTICAL INQUIRER and *Free Inquiry*—will be completed in Spring 1995. By one measure we have already *exceeded* our goal. Thanks to bequest, trust, and endowment giving, the aggregate campaign total stands at almost $4,200,000—well above our original $3.9 million target.

CONSTRUCTION CASH GAP REMAINS TO BE CLOSED

It is still imperative that we close an estimated $150,000 gap in *cash giving*. By raising these funds during Spring 1995, CSICOP will avoid the necessity of tapping a costly line of credit in order to finance the final stages of construction. Your support can make a crucial difference at this time. If you have not yet participated in the Price of Reason Campaign, please make your decision of support today. If you have already given, please consider expanding your gift.

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CSICOP
Campaign Co-Chair

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STEVE ALLEN
CODESH
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YOU MADE IT POSSIBLE

Never before in the history of organized skepticism has there been a capital fund drive on this scale. The Price of Reason Campaign has collected the largest single sum ever raised through private sources for the defense of reason through skeptical inquiry. As a result, CSICOP will share in the benefits of a permanent headquarters, including top-flight library and conference facilities that will transmit a progressive image of our movement for years to come. We can all share in the pride of this achievement. To all our readers and friends, we offer our most profound thanks.

To support the PRICE OF REASON CAMPAIGN or for more information contact: *Skeptical Inquirer*, PO Box 703, Amherst, NY 14226. Or call toll-free **1-800-634-1610.**

All inquiries will be held in the strictest confidence. *Skeptical Inquirer* is published by the Committee for the Scientific Investigation of Claims of the Paranormal. (CSICOP), Inc., a 501 (c)(3) tax-exempt educational organization.

THE PRICE OF REASON

JOIN US FOR A ONCE-IN-A-LIFETIME CELEBRATION

The Center for Inquiry, Phase II will be dedicated at a gala weekend event. Join us from Friday, June 9, through Saturday, June 10, 1995, at the Center for Inquiry in Amherst, New York. Famed entertainer and campaign co-chairman Steve Allen will dedicate the building and offer a special, intimate performance for attendees. Also on hand will be CSICOP Executive Council members Kendrick Frazier, editor of the *Skeptical Inquirer*, James Alcock, Ray Hyman, Philip Klass, Joe Nickell, and Lee Nisbet; members of the FREE INQUIRY editorial board; and other notable speakers to be announced. Call 1-800-634-1610 to receive program information.

FRIDAY, JUNE 9, 1995

10:00 AM–NOON: Opening Ceremonies at the Center for Inquiry

Featuring: **Paul Kurtz**, Chairman of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) and Chairman of the Council for Democratic and Secular Humanism (CODESH); **Steve Allen**, entertainer and author; **Kendrick Frazier**, Editor, the SKEPTICAL INQUIRER and **Vern Bullough**, Senior Editor, FREE INQUIRY. (Other speakers are being added.)

NOON–1:30 PM: Luncheon at the Center for Inquiry

1:30 PM–2:00 PM: Keynote Address *(speaker to be announced)*

2:00 PM–4:30 PM: "Skepticism: An Agenda for the Future"

Speakers: CSICOP Executive Council members **James Alcock**, Ray Hyman, Barry Karr, Philip Klass, Joe Nickell, and Lee Nisbet

4:30 PM–6:30 PM: Dinner on your own

6:30 PM–8:00 PM: Reception at the State University of New York at Buffalo's Center for the Arts (directly across from the Center for Inquiry)

8:00 PM-9:30 PM: Performance by STEVE ALLEN at the Center for the Arts

Steve Allen, one of America's most beloved entertainers, will perform an evening of song and comedy. The creator of NBC's "Tonight Show," he is the author of 45 books and a pre-eminent intellectual in the American media.

SATURDAY, JUNE 10

9:30 AM–NOON: "Reason and Dissent in a Free Society: The Vital Role of Secular Humanism"

Speakers: FREE INQUIRY editors **Robert Alley, Joe Barnhart, Tom Flynn, Gerald Larue, Tim Madigan, Molleen Matsumura, Edythe McGovern, Gordon Stein**

NOON–2:00 PM: Luncheon at Prometheus Books Headquarters

Speakers: Prometheus editors **Mark Hall, Jonathan Kurtz, Steven Mitchell, Lynette Nisbet, Eugene O'Connor**

2:00 PM–4:00 PM: Future Goals and Directions: A Participatory Workshop

4:30 PM–11:00 PM: A Visit to the Shaw Festival in Niagara-on-the-Lake, Ontario, Canada *(optional)*

Registration: $125 per person (**includes lunches on Friday and Saturday,** and the **Steve Allen** performance Friday night)

Shaw Festival visit: $85 (includes bus ride, dinner at the Pillar and Post Restaurant, and the play "You Never Can Tell" by George Bernard Shaw.)

The following hotels are available:

Hampton Inn (single rate $66/double rate $70) 716-689-4414
Red Roof Inn (single rate $46.99/double rate $49.99) 716-689-7474
Motel 6 (single/double rate $34.99) 716-834-2231
Super 8 Motel (single/double rate $50.88) 716-688-0811

Mention **"The Center for Inquiry"** to receive these special rates. Rooms should be reserved no later than May 24.

Use Visa or MC to register for Grand Opening and call toll free 1-800-634-1610

Doug Henning and the Giggling Guru

MARTIN GARDNER

Because magic is my main hobby I feel a keener regret than most people over the way in which the Hindu cult of Transcendental Meditation (TM) has taken over the life of one of the best of modern magicians. In the 1970s, Doug James Henning's Magic Show ran on Broadway for more than four years. Henning followed with marvelous NBC-television spectaculars, Las Vegas and Lake Tahoe bookings, and numerous talk-show appearances.

Then something happened to Doug on his way to a magic shop. He discovered TM and became a pal of its founder, His Holiness Maharishi Mahesh Yogi. "The moment I saw him," Doug has often said, "I knew that he knew the truth of life." In a few years Henning became TM's most famous convert since Mia Farrow and the Beatles.

First, some words about TM. Based on ancient Veda teachings that Maharishi learned from a Himalayan holy man, it stresses a form of meditation linked to the recitation of a Sanskrit word called a *mantra*. The technique is said to relieve stress, slow aging, and promote what TMers call "pure bliss." Moreover, TM instructors promise to teach you, after you fork over thousands of dollars for advanced courses, a variety of awesome supernormal powers known as *sidhis*. They include the ability to become invisible, to see hidden things, to walk through walls, and to fly through the air like Peter Pan and Wendy. Doug's conjuring was fake magic. TM teaches *real* magic.

Vedic flying has been the most publicized of the sidhis. Photographs distributed by TM officials show devotees in a lotus position and seemingly floating in midair. The photos are misleading. No TMer has yet demonstrated levitation to an outsider. The best they can show is the ability to flex one's legs while in a lotus position on a springy mattress and hop upward a short distance. The phony photos were snapped when the supposed floater was at the top of a bounce. One cynic said he never believed the woman in a picture was actually levitating, that instead she was being held up by an invisible TMer!

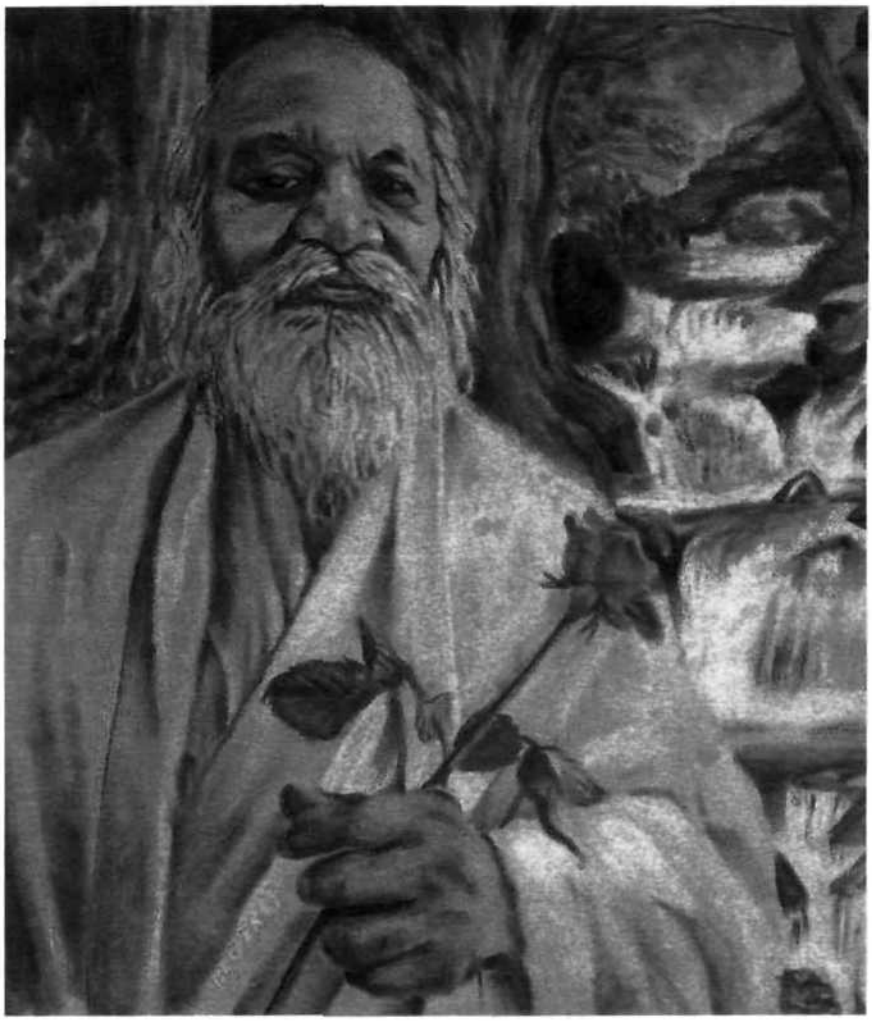
The flying sidhi has four stages. First, a twitching of limbs. Second, the hop. Third, hovering. Fourth, actual flying. Only the first and second stages have been shown to skeptics, although devout TMers firmly believe that there are Vedic flyers in India and that Maharishi can take off whenever he likes even though no one has ever seen or videotaped him in flight.

"When you reach your full potential," Henning told a reporter, "and you think 'I want to levitate,' you can levitate." And in a lecture: "You can disappear at a high state of consciousness because your body just stops reflecting light."

Amazingly, TMers are greatly entranced by lotus hopping. Last October a demonstration was held at the University of Toronto. Three Vedic "flyers" giggled while they bounced on their bums for five minutes, looking (said one observer) like legless frogs. I was told by Charles Reynolds, who for many years designed Doug's stage illusions, that during one of Henning's TV rehearsals he periodically halted all activity so those present could meditate and send him powerful vibes while he tried vainly to float. He actually believed he might be able to demonstrate levitation on his forthcoming show!

Several disenchanted TMers have sued the organization for failing to teach them powers that were promised. In 1987, for instance, Robert Kropinski, a former TM instructor, asked for $9 million because he was never able to fly. He also charged that TM had caused him "headaches, anxiety, impulses toward violence, hallucinations, confusion, loss of memory, screaming fits, lack of focus, paranoia, and social withdrawal." A Philadelphia jury awarded him $138,000.

Giggling seems endemic among TMers—something similar to the "holy laughter" currently popular in



James Becker

The Maharishi Mahesh Yogi, founder of the Transcendental Meditation movement.

Pentecostal churches. The tiny, white-bearded, beflowered Maharishi giggled constantly during two appearances on the Merv Griffin show. Physicists tend to break into unholy laughter when they hear about Vedic flying.

Since he started TM, the giggling guru has raked in an estimated $3 billion from his millions of gullible followers. He now controls a vast empire that includes a conglomeration of Heaven on Earth Hotels around the world, a consulting corporation, numerous trading companies, medical clinics, and other firms here and there.

Maharishi Ayur-Veda Products International (MAPI) sells a raft of herbs, teas, oils, incense, and natural food substances said to cure diseases and reverse aging. Admirers of the best-selling books on "quantum healing" by Boston's Deepak Chopra may be surprised to know that he is a TM booster with close ties to MAPI, president of a Maharishi Vedic University in Cambridge, Massachusetts, and owner of an Ayur-Vedic clinic in Boston. In 1989 His Holiness awarded Chopra the title of "Lord of Immortality of Heaven and Earth."

Maharishi Research universities are all over the globe. There is one in Lake Lucerne, Switzerland, others in Fairfield, Iowa (the movement's U.S. headquarters), in Buckinghamshire, England, in Asbury Park, New Jersey, and in Vlodrop, Netherlands. Vlodrop is the movement's world headquarters, where Maharishi now lives. The colleges seem to spring up and die like mushrooms.

The word "research" in the names of these universities refers to investigations of what is called Vedic science. It is said to combine the subjective approach of the East with the objective approach of Western science and to usher in what the Maharishi calls the "full sunshine of the dawning of the age of Enlightenment." According to His Holiness, the universe is permeated by a "field of consciousness" underlying the laws of quantum mechanics. The Maharishi, who once studied physics, is keen on the latest *results in particle theory.*

Expensive double-spread ads in the *New York Times,* the *Washington Post,* the *Toronto Globe and Mail, Time, Newsweek,* and who knows where else, periodically promote the Maharishi's unified field theory. Physicist John S. Hagelin is the movement's top quantum-mechanics maven. He has predicted that Maharishi's influence on history "will be far greater than that of Einstein or Gandhi." Hagelin and other scientists at TM universities have written hundreds of technical papers, most of them published by TM university presses, although a few have sneaked into mainstream science and medical journals unaware of the authors' TM affiliation.

In his paper "Is Consciousness the Unified Field?" Hagelin (who has a Harvard doctorate in physics) conjectures that the sidhis operate by upsetting "the balance of statistical averaging" in quantum-mechanical laws:

> Indeed, the phenomenon of levitation, *with its implied control over* the local curvature of space-time geometry, would appear to require the ability to function coherently at the scale of quantum gravity, which is the assumed scale of super-unification and the proposed domain of pure consciousness. In this way some of the sidhis, if demonstrated under laboratory conditions, would provide striking evidence for the proposed identity between pure consciousness and the unified field.

TMers have no doubts about the "Maharishi effect." This refers to incredible changes produced by mass meditations. The movement claims that their efforts helped bring down the Berlin wall, resolve the Gulf War, cause stock-market rises, collapse the Soviet

Union, decrease traffic accidents, and cut the crime rate in Washington, D.C., and other cities. Such wonders are supported, of course, by highly dubious statistics.

A few years ago, longing for political influence, His Holiness founded the Natural Law Party (NLP) in countries that include England and Canada. Henning is senior vice-president of the Canadian party. In 1992 he was the NLP candidate in England's general election, representing a residential section of Lancashire. He finished last among four candidates. In a 1994 Canadian election he was the party's candidate from Rosedale, where he and Debbie, his wife, live. Of 55,928 votes cast, he received 839. Physicist Hagelin was a candidate of the NLP for U.S. president in 1992. The party claimed it had 40 candidates running for Congress. The Canadian NLP platform maintains that once the party takes over the government, Canada's crime, unemployment, and deficit will disappear like the elephant that Doug vanished so many times on stage.

I found the elephant simile in Don Gillmor's "Like Magic," a lively article in *Toronto Life* (April 1994), to which this column is heavily indebted. Gillmor quotes Henning as saying, in reference to his party's promises: "We never see the stars going into debt and having to borrow light from the sun. We don't see robins having criminal tendencies and stealing from each other."

Although pushing 50, Henning still looks like a youth, small, slim, with long dark hair, droopy mustache, a mild, soft-spoken manner, and bucktooth grin. Born in Winnipeg, and a graduate of McMaster University, he began his magic career working parties and nightclubs around Canada. Such skilled magicians as Dai Vernon and Tony Slydini gave him lessons. Henning met the Marharishi in 1975, and for the next ten years he studied TM while still performing on stage. By 1986, convinced that his life mission was to promote TM, he gave up show business and sold his illusions to David Copperfield and other top stage performers.

For the past decade Henning's obsession has been to build a mammoth theme park he calls Veda Land. Plans to locate the park in India, then in Orlando, Florida, adjacent to Disney World, went down the tube. In 1987, with funds from Maharishi, Doug decided to build Veda Land in Niagara Falls, Ontario. Why there? Because, Henning told Gillmor, the falls are "the greatest natural wonder on Earth. . . . Our purpose is to create wonder for nature."

Unusual rides and exhibits will dramatize Veda Land's central theme—the mystery and beauty of nature. There

will be a convention center, a university, and a Tower of Peace, where world leaders can meet to settle disputes. A Magic Flying Carpet will carry 120 passengers onto a rose petal, plunge into its molecular and atomic structure, then finally come to rest in the flower's "pure consciousness." A Corridor of Time will display the history of the universe from the Big Bang to the far distant day when Shiva will dance the universe into oblivion. A preventive-medicine center will sell herbal remedies. Hotels will serve vegetarian and health meals, and there will be a Heaven on Earth housing project.

"Heaven on Earth" is Maharishi's favorite phrase for the world utopia that TM will eventually bring about. As he stirringly put it in the *Maharishi International University News* (Winter 1988), there will be "all good everywhere and nongood nowhere."

In keeping with the Hindu belief that all is maya, or illusion, Veda Land will abound with magical special effects designed by Roy Field, who once worked on the Superman movies. A large building will appear to float 15 feet above an artificial pond. Doug won't reveal how this great illusion will be accomplished, although presumably not by real magic. On the opening day a helicopter is expected to move a gigantic hoop over the levitated building the way Doug used to pass a hoop over floating ladies.

Asked if Veda Land will resemble Jim Bakker's fallen Christian theme park, Heritage USA, Doug replied: "It's more like, Wow! Isn't enlightenment great!"

TM recruits are given a mantra so secret that they are forbidden to disclose it to anyone, not even a spouse. The mantra is to be repeated silently while they meditate for 20 minutes each morning and late afternoon or evening. In the 1970s they were assured that their mantra was carefully selected from thousands to fit their personality. A skeptical investigator was puzzled when he joined the movement in three cities under three different names and was always given the same mantra. It turned out that there were just 16 mantras. The one given was determined solely by a person's age. Today's mantras may be different, but in 1977 if you were 26 to 29 your mantra was *shivim.* If over 60 it was *shama,* And so on.

Magicians who perform what the trade calls mental acts were quick to take advantage of the secret list of Sanskrit words before their linkage with ages became widely known. They would ask TMers in the audience to state their birthdate, then pretend to

Guru continued on page 54

Tales from the TV Talk Shows

C. EUGENE EMERY, JR.

Load the tape, grab the remote, press PLAY, and let's step back in time.

It's December 8, 1994, and Sally Jessy Raphael is poised to give the viewers of her TV talk show the inside scoop on the still-simmering O. J. Simpson case. Among her experts: "criminal psychic" John Monti.

Monti proceeds to weave a spell-binding tale, based on his psychic vibrations, of how Nicole Simpson and Ronald Goldman were murdered in "a drug deal that went bad" because "Nicole owed huge amounts" to her murderers.

Then, Monti says he has uncovered new evidence in the Simpson case. At the boisterous urging of the audience, and at the risk of being arrested at the conclusion of the show, he agrees to unveil his dramatic discovery on national television.

STOP.

It is a scene that plays itself out—in one form or another, using one theme or another—regularly on America's television sets. From my home base in Southern New England, I am privy to more than 15 network and syndicated television talk shows featuring guests anxious to discuss everything from battered men to women who say their beauty is ruining their love life.

Personal relationships (actually, dysfunctional relationships) are the bread and butter of these shows. But when it's time to get away from such topics as children from violent homes, overbearing parents, rich abused women, and women who have poor personal hygiene (all topics on Oprah Winfrey the week that Monti appeared on the Raphael show), talk shows often serve up an unabashedly supportive look at things supernatural.

The hosts of these shows sometimes argue that they're doing a public service by publicizing important issues swept under the rug by polite society. But when the topic is psychics, UFOs, or other aspects of the paranormal, it's real science that gets swept under the rug. The informed skeptic—if there is one—may get two minutes of on-air time to battle wave upon wave of assertions and anecdotes. And the hosts and producers, in their endless search for compelling stories, either don't know, or don't want to know, that some of the tales spun by their guests are of questionable quality.

Consider the Monti appearance on the Sally Jessy Raphael show. If Raphael or her staff had done their research, they would have discovered that Monti has been consistently wrong when he has tried to predict unexpected events in the *National Enquirer*. According to Monti's *Enquirer* forecasts, 1992 was to be the year the Castro regime toppled, entire pro teams developed AIDS ("threatening to end professional sports"), and David Letterman and Jay Leno caused a sensation by swapping jobs at NBC. For 1993, according to Monti, Fergie would pose naked for *Playboy* and "a cure for AIDS will be discovered in a little-known chemical found in ordinary crabgrass." Whoopi Goldberg was supposed to give up acting and enter a convent in 1994, according to Monti.

Viewers got none of this background information. But during his Raphael appearance, folks with a critical eye got a revealing look into the behavior of a psychic who claims to help police solve crimes.

PLAY.

Before he reveals his startling piece of evidence, Monti tells Raphael's sympathetic audience that he knows where one of the two murder weapons in the Simpson case is buried—it's in O.J.'s backyard. He says he's told prosecutor Marcia Clark where to find it, but she's ignored him. "I don't know what her problem is," Monti says. "I think she is being bothered by DNA research too much, and she's not even from Harvard."

Then he explains how he scaled an eight-foot fence to get past a police guard, stood on Nicole Simpson's

blood stains and began poking around the grounds. Under some bushes, he says, he found something extraordinary.

"Do you think you should have turned it in to the *police?*" Raphael asks.

"What were *they* going to do?" Monti retorts, sparking applause from the audience.


Sally Jessy Raphael

As he reaches into his briefcase to remove a paper bag, Monti remarks, "I don't know what's going to happen to me after this," an interesting statement coming from a psychic.

From the bag, Monti removes a kitchen knife. Someone in the audience yells, "Oh my God!"

Monti, who claims to help police, is handling the knife without gloves. When "world-renowned psychic" Dayle Schear asks to hold it, Raphael says: "Oh, surely. That's a good idea."

Monti hands the knife to Schear and she begins rubbing her hands on it, obliterating any hope of finding fingerprints on the would-be weapon.

"Do you think we should have handled it with gloves or something?" Raphael asks as Schear returns the knife to Monti.

Responds Schear: "It's a little late now."

The only dose of reality comes at the end of the program when "Dana," a fan of O.J.'s, can't take it anymore.

"These people are *so* fake," she asserts. "If you're so psychic, could you please tell me what kind of matching bra set I have on?"

We're not to know. The "Sally" show quickly goes to commercial.

STOP. REWIND. PLAY.

It's July 19 and Oprah Winfrey's on the tube to talk about "an incredible and exciting method of marriage therapy" in which couples are hypnotized and taken back to past lives in an attempt to fully understand the problems in their current relationships.

With hypnotist Hazel Denning claiming that the technique "resolves possibly any problems you have," Oprah acknowledges that the concept may seem strange, but "all I'm asking is that you be open-minded."

One volunteer, Michael Gilbert, says that when he's been hypnotically regressed, he's seen dinosaurs. Oprah, apparently part of the 35 percent of the population whose Flintstones view of history makes them believe humans and dinosaurs lived in the same era, sees nothing wrong with this. "I'd want to come back (to the present) too if I was you," she jokes.


Oprah Winfrey

Oprah then shows a hypnotized Karl Homann being asked if his current wife, Karen, is present in the past life he is recalling. Homann announces: "I'm Karen." Denning explains that husband and wife were once one soul "and then they split."

And when Denning talks Homann into the future, a technique known as "progression," Homann sees himself meeting a space alien. "It's going to happen. I'm going to meet them," Homann says while in a trance. "He's ugly. But he's not mean."

STOP. FAST FORWARD. PLAY.

It's Tuesday, December 20, and Maury Povich is explaining that he's about to do his first show on UFO abductions because a recent poll says "three million Americans believe that they have been abducted. I guess there's something going on here."

But Povich has it wrong.

The 3-million figure comes from UFO promoters who believe that if you have had four of five experiences —waking up paralyzed and sensing a presence in the room, discovering an hour or more of unaccounted time, experiencing a feeling of flying, seeing unusual lights in a room and finding unexplained scars on your body—you have probably been abducted by extraterrestrials. About 2 percent of the nearly 6,000 adults polled fell into that category, which translates into 3.7 million Americans.

If Povich or his staff had bothered to check, they would have discovered that none of the people surveyed were even asked if they had been abducted.

Povich's guests include Harvard psychiatry professor John Mack—who argues that UFO-abduction tales are so similar they must be real—and Jone Victoria, a marketing director kidnapped by "very dark, very short" space aliens. Victoria says she realized she had been abducted after she underwent hypnotic regression therapy and Mack asked her if the five black dogs she remembers as coming to attack her at the age of six were actually dogs. Suddenly, Victoria says, she realized that "they weren't dogs at all!"

There are no questions raised about whether Mack was subtly encouraging Victoria to see the dogs as space aliens, or whether she went to Mack in the first place because she knew of Mack's interest in extraterrestrials.

Then there's "Dianne," a computer executive from Massachusetts, who claims she is abducted every couple of weeks. Has Povich's team planted a

Tales continued on page 54

Gene Emery is the science writer for the Providence Journal, *75 Fountain St., Providence, RI 02902.*

The Belief Engine

JAMES E. ALCOCK

Our brains and nervous systems constitute a belief-generating machine, a system that evolved to assure not truth, logic, and reason, but survival. The belief engine has seven major components.

The following beliefs are strongly held by large numbers of people. Each of them has been hotly disputed by others:

- Through hypnosis, one can access past lives.
- Horoscopes provide useful information about the future.
- Spiritual healing sometimes succeeds where conventional medicine fails.
- A widespread, transgenerational Satanic conspiracy is afoot in society.
- Certain gifted people have been able to use their psychic powers to help police solve crimes.
- We can sometimes communicate with others via mental telepathy.
- Some people have been abducted by UFOs and then returned to earth.
- Elvis lives.
- Vitamin C can ward off or cure the common cold.
- Immigrants are stealing our jobs.
- Certain racial groups are intellectually inferior.

- Certain racial groups are athletically superior, at least in some specific sports.

- Crime and violence are linked to the breakdown of the traditional family.

- North Korea's developing nuclear capability poses a threat to world peace.

Despite high confidence on the part of both believers and disbelievers, in most instances, neither side has much—if any—objective evidence to back its position. Some of these beliefs, such as telepathy and astrology, stand in contradiction to the current scientific worldview and are therefore considered by many scientists to be "irrational." Others are not at all inconsistent with science, and whether or not they are based in fact, no one would consider them to be irrational.

Nineteenth-century rationalists predicted that superstition and irrationality would be defeated by universal education. However, this has not happened. High literacy rates and universal education have done little to decrease such belief, and poll after poll indicates that a large majority of the public believe in the reality of "occult" or "paranormal" or "supernatural" phenomena. Why should this be so? Why is it that in this highly scientific and technological age superstition and irrationality abound?

James E. Alcock is professor of psychology, Glendon College, York University, Toronto.

It is because our brains and nervous systems constitute a belief-generating machine, an engine that produces beliefs without any particular respect for what is real or true and what is not. This belief engine selects information from the environment, shapes it, combines it with information from memory, and produces beliefs that are generally consistent with beliefs already held. This system is as capable of generating fallacious beliefs as it is of generating beliefs that are in line with truth. These beliefs guide future actions and, whether correct or erroneous, they may prove functional for the individual who holds them. Whether or not there is really a Heaven for worthy souls does nothing to detract from the usefulness of such a belief for people who are searching for *meaning in life.*

Nothing is fundamentally different about what we might think of as "irrational" beliefs—they are generated in the same manner as are other beliefs. We may not have an evidential basis for belief in irrational concepts, but neither do we have such a basis for most of our beliefs. For example, you probably believe that brushing your teeth is good for you, but it is unlikely that you have any evidence to back up this belief, unless you are a dentist. You have been taught this, it makes some sense, and you have never been led to question it.

If we were to conceptualize the brain and nervous system as a belief engine, it would need to comprise several components, each reflecting some basic aspect of belief generation. Among the components, the following units figure importantly:

1. The learning unit
2. The critical thinking unit
3. The yearning unit
4. The input unit
5. The emotional response unit
6. The memory unit
7. The environmental feedback unit.

The Learning Unit

The learning unit is the key to understanding the belief engine. It is tied to the physical architecture of the brain and nervous system; and by its very *nature, we are condemned to a virtu*ally automatic process of magical thinking. "Magical thinking" is the interpreting of two closely occurring events as though one caused the other, without any concern for the causal link. For example, if you believe that crossing your fingers brought you good fortune, you have associated the act of finger-crossing with the subsequent welcome event and imputed a causal link between the two.

Our brain and nervous system have

evolved over millions of years. It is important to recognize that natural selection does not select directly on the basis of reason or truth; it selects for reproductive success. Nothing in our cerebral apparatus gives any particular status to truth. Consider a rabbit in the tall grass, and grant for a moment a modicum of conscious and logical intellect to it. It detects a rustling in the tall grass, and having in the past learned that this occasionally signals the presence of a hungry fox, the rabbit wonders if there really is a fox this time or if a gust of wind caused the grass to rustle. It awaits more conclusive evidence. Although motivated by a search for truth, that rabbit does not live long. Compare the late rabbit to the rabbit that responds to the rustle with a strong autonomic nervous-system reaction and runs away as fast as it can. It is more likely to live and reproduce. So, seeking truth does not always promote survival, and fleeing on the basis of erroneous belief is not always such a bad thing to do. However, while this avoidance strategy may succeed in the forest, it may be quite dangerous to pursue in the nuclear age.

"We are not always able to distinguish material originating in the brain from material from the outside world. . . ."

The learning unit is set up in such a way as to learn very quickly from the association of two significant events—such as touching a hot stove and feeling pain. It is set up so that significant pairings produce a lasting effect, while nonpairings of the same two events are not nearly so influential. If a child were to touch a stove once and be burned, then if the child were to touch it again without being burned, the association between pain and stove would not automatically be unlearned. This basic asymmetry—pairing of two stimuli has an important effect, while presenting the stimuli unpaired (that is, individually) has a much lesser effect—is important for survival.

This asymmetry in learning also underlies much of the error that colors our thinking about events that occur together from time to time. Humans are very poor at accurately judging the relationship between events that only sometimes co-occur. For example, if we think of Uncle Harry, and then he telephones us a few minutes later, this might seem to demand some explanation in terms of telepathy or precognition. However, we can only properly evaluate the co-occurrence of these two events if we also consider the number of times that we thought of Harry and he did not call, or we did not think of him but he called anyway. These latter circumstances—these nonpairings—have little impact on our learning system. Because we are overly influenced by pairings of significant events, we can come to infer an association, and even a causal one, between two events even if there is none. Thus, dreams may correspond with subsequent events only every so often by chance, and yet this pairing may have a dramatic effect on belief. Or we feel a cold coming on, take vitamin C, and then when the cold does not get to be too bad we infer a causal link. The world around us abounds with coincidental occurrences, some of which are meaningful but the vast majority of which are not. This provides a fertile ground for the growth of fallacious beliefs. We readily learn that associations exist between events, even when they do not. We are often led by co-occurring events to infer that the one that occurred first somehow caused the one that succeeded it.

We are all even more prone to error when rare or emotionally laden events are involved. We are always looking for causal explanations, and we tend to infer causality even when none exists. You might be puzzled or even distressed if you heard a loud noise in your living room but could find no source for it.

The Critical-Thinking Unit

The critical-thinking unit is the second component of the belief engine, and it is acquired—acquired through experience and explicit education. Because of the nervous-system architecture that I have described, we are born to magical thinking. The infant who smiles just before a breeze causes a mobile above her head to move will smile again and again, as though the smile had magically caused the desired motion of the mobile. We have to labor to overcome such magical predisposition, and we never do so entirely. It is through experience and direct teaching that we come to understand the limits of our immediate magical intuitive interpretations. We are taught common logic by parents and teachers, and since it often serves us well, we use it where it seems appropriate. Indeed, the cultural parallel of this developmental process is the development of the formal method of logic and scientific inquiry. We come to realize that we cannot trust our automatic inferences about co-occurrence and causality.

We learn to use simple tests of reason to evaluate events around us, but we also learn that certain classes of events are not to be subjected to reason but should be accepted on faith. Every society teaches about transcendental things—ghosts, gods, bogeymen, and so on; and here we are often explicitly taught to ignore logic and accept such things on faith or on the basis of other people's experiences. By the time we are adults, we can respond to an event in either a logical, critical mode or in an experiential, intuitive mode. The events themselves often determine which way we will respond. If I were to tell you that I went home last night and found a cow in my living room, you would be more likely to laugh than to believe me, even though there is certainly nothing impossible about such an event. If, on the other hand, I were to tell you that I went into my living room and was startled by an eerie glow over my late grandfather's armchair, and that the room went cold, you may be less likely to disbelieve and more

likely to perk up your ears and listen to the details, possibly suspending the critical acumen that you would bring to the cow story. Sometimes strong emotion interferes with the application of critical thought. Other times we are cleverly gulled.

Rationality is often at a disadvantage to intuitive thought. The late psychologist Graham Reed spoke of the example of the gambler's fallacy: Suppose you are observing a roulette wheel. It has come up black ten times in a row, and a powerful intuitive feeling is growing in you that it must soon come up red. It cannot keep coming up black forever. Yet your rational mind tells you that the wheel has no memory, that each outcome is independent of those that preceded. In such a case, the struggle between intuition and rationality is not always won by rationality.

Note that we can switch this critical thinking unit on or off. As I noted earlier, we may switch it off entirely if dealing with religious or other transcendental matters. Sometimes, we deliberately switch it on: "Hold it a minute, let me think this out," we might say to ourselves when someone tries to extract money from us for an apparently worthy cause.

The Yearning Unit

Learning does not occur in a vacuum. We are not passive receivers of information. We actively seek out information to satisfy our many needs. We may yearn to find meaning in life. We may yearn for a sense of identity. We may yearn for recovery from disease. We may yearn to be in touch with deceased loved ones.

In general we yearn to reduce anxiety. Beliefs, be they correct or false, can assuage these yearnings. Often beliefs that might be categorized as irrational by scientists are the most efficient at reducing these yearnings. Rationality and scientific truth have little to offer for most people as remedies for existential anxiety. However, belief in reincarnation, supernatural intervention, and everlasting life can overcome such anxiety to some extent.

When we are yearning most, when we are in the greatest need, we are even more vulnerable to fallacious beliefs that can serve to satisfy those yearnings.

The Input Unit

Information enters the belief engine sometimes in the form of raw sensory experience and other times in the form of organized, codified information presented through word of mouth, books, or films. We are wonderful pattern detectors, but not all the patterns we detect are meaningful ones. Our perceptual processes work in such a way as to make sense of the environment around us, but they do *make* sense—perception is not a passive gathering of information but, rather, an active construction of a representation of what is going on in our sensory world. Our perceptual apparatus selects and organizes information from the environment, and this process is subject to many well-known biases that can lead to distorted beliefs. Indeed, we are less likely to be influenced by incoming information if it does not already correspond to deeply held beliefs. Thus, the very spiritual Christian may be quite prepared to see the Virgin Mary; information or perceptual experience that suggests that she has appeared may be more easily accepted without critical scrutiny than it would be by someone who is an atheist. It is similar with regard to experiences that might be considered paranormal in nature.

The Emotional Response Unit

Experiences accompanied by strong emotion may leave an unshakable belief in whatever explanation appealed to the individual at the time. If one is overwhelmed by an apparent case of telepathy, or an ostensible UFO, then later thinking may well be dominated by the awareness that the emotional reaction was intense, leading to the conclusion that something unusual really did happen. And emotion in turn may directly influence both perception and learning. Something may be interpreted as bizarre or unusual because of the emotional responses triggered.

Evidence is accumulating that our emotional responses may be triggered by information from the outside world even before we are consciously aware that something has happened. Take this example, provided by LeDoux (1994) in his recent article in *Scientific American* (1994, 270, pp. 50-57):

> An individual is walking through the woods when she picks up information—either auditory, such as rustling leaves, or visual, such as the sight of a slender curved object on the ground—which triggers a fear response. This information, even before it reaches the cortex, is processed in the amygdala, which arouses the body to an alarm footing. Somewhat later, when the cortex has had enough time to decide whether or not the object really is a snake, this cognitive information processing will either augment the fear response and corresponding evasive behaviour, or will serve to bring that response to a halt.

This is relevant to our understanding of paranormal experience, for very often an emotional experience accompanies the putatively paranormal. A strong coincidence may produce an emotional "zing" that points us toward a paranormal explanation, because normal events would not be expected to produce such emotion.

Our brains are also capable of generating wonderful and fantastic perceptual experiences for which we are rarely prepared. Out-of-body experiences (OBEs), hallucinations, near-death experiences (NDEs), peak experiences—these are all likely to be based, not in some external transcendental reality, but rather in the brain itself. We are not always able to distinguish material originating in the brain from material from the outside world, and thus we can falsely attribute to the external world perceptions and experiences that are created within the brain. We have little training with regard to such experience. As children, we do learn to distrust, for the most part, dreams and nightmares. Our parents and our culture tell us that they are products of our own brains. We are not prepared for more arcane experiences, such as OBEs or hallucinations or NDEs or peak experiences, and may be

so unprepared that we are overwhelmed by the emotion and come to see such experience as deeply significant and "real" whether or not it is.

Ray Hyman has always cautioned skeptics not to be surprised should they one day have a very strong emotional experience that seems to cry out for paranormal explanation. Given the ways our brains work, we would expect such experiences from time to time. Unprepared for them, they could become conversion experiences that lead to strong belief. When I was a graduate student, another graduate student who shared my office, and who was equally as skeptical as I was about the paranormal, came to school one day overwhelmed by the realism and clarity of a dream he had had the night before. In it, his uncle in Connecticut had died. It had been a very emotional dream, and was so striking that Jack told me that if his uncle died anytime soon, he would no longer be able to maintain his skepticism about precognition—the dream experience was that powerful. Ten years later, his uncle was still alive, and Jack's skepticism had survived intact.

The Memory Unit

Through our own experience, we come to believe in the reliability of our memories and in our ability to judge whether a given memory is reliable or not. However, memory is a constructive process rather than a literal rendering of past experience, and memories are subject to serious biases and distortions.

Not only does memory involve itself in the processing of incoming information and the shaping of beliefs; it is itself influenced strongly by current perceptions and beliefs. Yet it is very difficult for an individual to reject the products of his or her own memory process, for memory can seem to be so "real."

The Environmental Feedback Unit

Beliefs help us to function. They guide our actions and increase or reduce our anxieties. If we operate on the basis of a belief, and if it "works" for us, even though faulty, why would we be inclined to change it? Feedback from the external world reinforces or weakens our beliefs, but since the beliefs themselves influence how that feedback is perceived, beliefs can become very resistant to contrary information and experience. If you really believe that alien abductions occur, then any evidence against that belief can be rationalized away—in terms of conspiracy theories, other people's ignorance, or whatever.

As mentioned earlier, fallacious beliefs can often be even more functional than those based in truth. For example, Shelley Taylor, in her book *Positive Illusions,* reports research showing that mildly depressed people are often more realistic about the world than are happy people. Emotionally healthy people live to some extent by erecting false beliefs—illusions—that reduce anxiety and aid well-being, whereas depressed individuals to some degree see the world more accurately. Happy people may underestimate the likelihood of getting cancer or being killed, and may avoid thinking about the ultimate reality of death, while depressed people may be much more accurate with regard to such concerns.

An important way in which to run reality checks on our perceptions and beliefs is to compare them with those of others. If I am the only one who interpreted a strange glow as an apparition, I am more likely to reconsider this interpretation than if several others share the same view. We often seek out people who agree with us, or selectively choose literature supporting our belief. If the majority doubts us, then even if only part of a minority we can collectively work to dispel doubt and find certainty. We can invoke conspiracies and coverups to explain an absence of confirmatory evidence. We may work to inculcate our beliefs in others, especially children. Shared beliefs can promote social solidarity and even a sense of importance for the individual and group.

In Conclusion

Beliefs are generated by the belief engine without any automatic concern for truth. Concern for truth is a higher order acquired cognitive orientation that reflects an underlying philosophy which presupposes an objective reality that is not always perceived by our senses.

The belief engine chugs away, strengthening old beliefs, spewing out new ones, rarely discarding any. We can sometimes see the error or foolishness in other people's beliefs. It is very difficult to see the same in our own. We believe in all sorts of things, abstract and concrete—in the existence of the solar system, atoms, pizza, and five-star restaurants in Paris. Such beliefs are no different in principle from beliefs in fairies at the end of the garden, in ghosts in some deserted abbey, in werewolves, in satanic conspiracies, in miraculous cures, and so on. Such beliefs are all similar in form, all products of the same process, even though they vary widely in content. They may, however, involve greater or lesser involvement of the critical-thinking and emotional-response units.

Critical thinking, logic, reason, science—these are all terms that apply in one way or another to the deliberate attempt to ferret out truth from the tangle of intuition, distorted perception, and fallible memory. The true critical thinker accepts what few people ever accept—that one cannot routinely trust perceptions and memories. Figments of our imagination and reflections of our emotional needs can often interfere with or supplant the perception of truth and reality. Through teaching and encouraging critical thought our society will move away from irrationality, but we will never succeed in completely abandoning irrational tendencies, again because of the basic nature of the belief engine.

Experience is often a poor guide to reality. Skepticism helps us to question our experience and to avoid being too readily led to believe what is not so. We should try to remember the words of the late P. J. Bailey (in *Festus: A Country Town*): "Where doubt, there truth is—'tis her shadow." □

The Skeptical Position: Is It Tenable?

JOHN BELOFF

John Beloff, a psychologist at the University of Edinburgh, has for several decades been one of the most prominent leaders in the field of parapsychology. While it might seem unusual for us to publish an article by a parapsychologist, we think this one is appropriate and may stimulate some useful interaction. We follow it with short responses by several well-regarded critics of parapsychology. —The Editor

If the 'skeptical position' regarding parapsychology is to be tenable, says Beloff, it must apply not only to the latest experimental evidence—where repeatability on demand may forever elude investigators—but also to historical cases.

By the "skeptical position" I shall here mean the view that there is no evidence, as yet, that would justify acknowledging any phenomenon as "paranormal." On this view parapsychology is, at best, a potential science, concerned as it is with claims that still await authentication. Moreover, given the fact that attempts to clinch such claims have now been going on for at least a century, the prospect that any phenomenon will in due course be universally recognized as paranormal must be considered increasingly unlikely. The "skeptical position," so defined, is today widely held among the scientific community with, inevitably, unfortunate practical consequences for para-

psychology, especially when it comes to funding. It is the aim of this paper to consider whether or not this position is, philosophically, defensible.

The skeptical position, as I have stated it, represents what I shall call *de facto* skepticism. A "de facto skeptic" is an empiricist who is willing, in principle, to abide by the evidence but is not satisfied that the evidence in this case is coercive. Paul Kurtz voices the attitude of the de facto skeptic when he writes: "Philosophers have analyzed the coherence between physical theories and alleged extrasensory functions in order to determine whether the latter are consistent with physical laws. I submit that one should be dubious about purely a priori formal methods of evaluation, because if the phenomenon is found to be genuine it is the *antecedent conceptual system* that will have to be modified. The data must not be sacrificed at the altar of preconceived notions of logical coherence" [my emphasis] (Kurtz 1992:145). His subsequent remarks, however, reveal that what he is, in fact, open-minded about are "anomalies." Parapsychological findings may, Kurtz concedes, in due course be taken at face value but always with the tacit understanding that they can eventually be reconciled with a physicalist worldview. Hence he specifically rejects the term *paranormal* if this is taken to imply any kind of "spiritual, mental, or idealistic dimensions" (p. 149). Kurtz, we might say, is a "de facto" skeptic about the paranormal in the weak sense of an anomaly but an "absolute" skeptic about the paranormal in the strong sense in which it has inspired so many parapsychologists. His position, I may add, is by no means idiosyncratic; it is, on the contrary, widely shared by members of the scientific and academic communities.

Absolute Skepticism

For an "absolute" or "a priori" skeptic, evidence is simply irrelevant. It would make no difference what evidence the parapsychologist might adduce; an absolute skeptic could always nullify it by invoking some general principle, such as consistency with known physical laws, as in Kurtz's example, or some other cherished criterion. There are not many among our critics, I may say, who profess absolute skepticism in this sense; yet, in practice, it provides a fallback position when de facto skepticism begins to look shaky. Although absolute skepticism could be described as a form of dogmatism, we must not dismiss it as irrational. All of us, after all, are absolute skeptics about certain claims that overstrain our credulity. Speaking for myself, I would have to confess to being an absolute skeptic when it comes to claims that extraterrestrial aliens have visited the earth. No matter how many eyewitness reports might be pushed under my nose, I would still decline to credit them. For it would always strike me as more likely that the reports were misleading than that the claims were valid. Of course, even absolute skepticism is never absolute in the logical sense, inasmuch as we could always envisage some *hypothetical* example that would force us to change our mind. No doubt if I myself were to have a close encounter with an extraterrestrial alien, I presumably would have no option but to change my mind. So long, however, as I regard such a hypothesis as an academic exercise, I would still count as an absolute skeptic with respect to claims of this sort. Likewise, even the most dismissive of skeptics would presumably change their tune in the face of some overwhelming manifestation of the paranormal, but, pending such an eventuality, they would qualify as absolute skeptics with respect to the parapsychological evidence.

The pioneer of absolute skepticism with respect to what he called "miracles" was, of course, David Hume (Hume 1777). His argument was simple. A miracle, by definition, contravenes our past experiences. At the same time, we all know to our cost that liars and deceivers abound. Hence, even if miracles *did* occur, it would always be more rational to doubt the testimony of the witnesses than to accept the miracle as a fact. We must note, however, that there is a subtle difference between a *miracle,* as Hume understood the term, and what we now call a "paranormal event." A miracle contradicts only certain universal expectations as to what can or cannot happen. A paranormal event, on the other hand, is anomalous with respect to the entire conceptual framework of science as we know it. Hence, to call something paranormal is, as Kurtz rightly insists, to call into question the universality of the prevailing scientific worldview. Hume conceded that, if a miracle could be regularly repeated, we would be forced to believe in it, but then it would ipso facto cease to be a miracle! A paranormal phenomenon, on the other hand, would still be paranormal even after the umpteenth repetition so long as no scientific explanation was forthcoming. Repetition is, of course, a key issue for the skeptical position, and we shall be returning to it later. Antony Flew (1978) endorses Hume with respect to all past claims of a paranormal kind and so could be classed as an absolute skeptic with respect to the historical record, but even he concedes that, if parapsychologists were able to satisfy repeatability *on demand,* we would then, indeed, have to revise our assumptions.

Some critics, who may be de facto skeptics with respect to parapsychology as a whole, may be absolute skeptics with respect to certain classes of psi phenomena. For example, some who are open-minded about extrasensory perception (ESP) may take exception to psychokinesis (PK). Others, who are prepared to accept micro-PK, may draw the line at macro-PK. Flew has, throughout his long career as a skeptic, consistently rejected precognition as nonsensical (cf. Flew 1987). He does so on the grounds that it implies that a cause may occur *after* its effect. And he is perfectly correct, of course, in saying that precognition implies backward causation. Where he goes astray is in thinking that backward causation is somehow *logically* objectionable—

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however offensive it may be to our common sense. If one were to follow Flew, one would have to dismiss all traditional beliefs in prophecy and foreknowledge as not just false but literally meaningless—which seems odd to say the least! Even odder is the fact that, faced with one such instance—let us suppose Flew were to dream consistently of the winner of tomorrow's horse-race—he could not call his dreams "precognitive"; at most he could express surprise at his astonishing run of luck. Coincidence has, of course, always been a *logical* option where any psi phenomenon is concerned, but the science of statistics has enabled us to put a value on the *degree* of coincidence we would need to posit once we reject a causal explanation. An absolute skeptic has to be prepared to accept as a mere coincidence what others would see as paranormal no matter what level of probability was attained.

Perhaps the most audacious absolute skeptic of recent times is Nicholas Humphrey, current holder of the Perrott-Warrick Research Fellowship at Darwin College, Cambridge. He alone, to my knowledge, has pronounced psi phenomena to be *logically* impossible. This is indeed startling because, in the ordinary way, nothing whatsoever, no matter how extraordinary or incredible, can be said to be *logically* impossible—unless, of course, it involves a contradiction. Then, even God, who was thought to be omnipotent, could not, theologians agreed, do what was logically impossible! What, then, could have induced Humphrey to dismiss psi phenomena as "logically impossible"? Until he publishes his definitive treatise, all I can go by is some personal correspondence and some miscellaneous pronouncements. But the gist of it seems to be that, notably in the case of PK but, by extension, to psi in general, the outcome appears to be more complex than the input. Thus, in a typical micro-PK experiment, the intention on the part of the subject may be simply to enhance the score, by shifting a pointer, producing a click, or whatever. At the same time, the physical processes required to produce this result may be highly complex. Thus one is confronted with the paradox of an input containing minimal information issuing an output that is informationally rich. Or, as Humphrey puts it, the problem is "how the supposed psychic powers can have the 'targeting' and 'indexical' properties they must have if they are to do their job" (Humphrey 1993).

This feature of the psi process, to which Humphrey rightly draws our attention, is familiar to parapsychologists as the "goal oriented" aspect of psi. The concept of goal orientation, however, is by no means confined to psi phenomena. When I write something down, for example, I think and intend only the words that I wish to write, or, more likely, just the meaning I wish to convey, confident that my hands will automatically execute the relevant movements of my fingers on the page or keyboard as the case may be. What makes writing a normal, rather than a paranormal, activity is, of course, that there is a physical connection between my brain and my hand. Now, to an epiphenomenalist, my *intention* to write is of no consequence. Provided that my brain is in the appropriate physical state, the relevant movements of my hand and finger will duly follow, just as when the computer is in the appropriate state it will trigger the appropriate display on the screen. My conscious intention is no more than a passive reflection of what my brain is doing and would, indeed, be doing were I never to be conscious at all! Hence, the fact that I, the agent, remain entirely ignorant as to what goes on in my brain and nervous system when engaged in voluntary activity is irrelevant. I suspect that what actually disturbs Humphrey is not this goal-oriented aspect of psi phenomena, which, as I say, is common to all normal voluntary activity, but rather the fact that, in the psi case, there is, ex hypothesi, no mechanical connection between the subject and the target system and so it cannot be subsumed under an epiphenomenalist view of mind. In other words, it is the concept of the paranormal *as such* that really bothers Humphrey, as it bothered Kurtz. To a dualist-interactionist like myself, on the other hand, this analogy between what goes on in normal voluntary behavior and in a successful test for PK is profoundly suggestive and illuminating. In both instances, as we see it, physical processes are brought into play in order to fulfill a specific wish or intention. If that is "magical thinking," then so be it; the evidence from parapsychology demands no less.

So much for absolute skepticism. The attempt to show that psi phenomena involve some kind of logical fallacy has not succeeded and cannot do so. Alternatively, to dismiss such phenomena out of hand as too absurd or fantastic to warrant serious consideration (as I myself wanted to do with respect to extraterrestrial visitations), although still an option, becomes increasingly threadbare when one examines the best experimental evidence of recent years, to which we must now turn.

"The skeptical position, as I have defined it, represents what I shall call de facto skepticism."

De Facto Skepticism

Let us now consider the more serious challenge from those I have called the "de facto skeptics," who claim to have open minds but who demand stronger evidence than anything that has so far been produced. Ray Hyman, James Alcock, Persi Diaconis, and other distinguished associates of CSICOP exemplify this category. The report of the National Research Council, *Enhancing Human Performance* (Druckman and Swets 1988), is an expression of this outlook, while the critique of it by Palmer, Honorton, and Utts (1989) shows why it fails to convince parapsychologists.

Perhaps nothing has done more to bring the skeptical position into focus

than the advent of meta-analysis. Comprehensive and painstaking meta-analyses have now been carried out on all the major phenomena of experimental parapsychology. Each has yielded a combined z-score representing astronomical odds against chance. In no case, moreover, is there the suggestion that the weaker studies contributed unduly to this overall significance. It was Honorton's own meta-analysis of the ganzfeld studies (Honorton 1985) that sparked off the memorable ganzfeld debate in the pages of the *Journal of Parapsychology* between Honorton and Hyman, culminating in their "joint communique" (Hyman and Honorton 1986) and eliciting further contributions from assorted parapsychologists and their critics. Another attempt to play up the meta-analytic evidence was the paper by the statistician Jessica Utts in *Statistical Science* (Utts 1991). Yet it was clear from the invited comments on the Utts paper that the skeptics remained skeptics. Since it is now obvious that meta-analysis has *not* turned the tide, we must ask why? What is still lacking?

The answer, in a phrase, is "repeatability on demand." The database for the meta-analytic studies shows that by no means every experiment that uses a particular procedure produces a significant outcome. Indeed, in the case of the ganzfeld studies, which now may be said to represent state-of-the-art parapsychology, only 12 of the 28 studies considered by Honorton in his 1985 analysis (i.e., 43 percent) (Honorton 1985) were significant at the 5 percent level of confidence. Although much will depend on the number of trials attempted, this suggests that even for the keen parapsychologists who provided these data, there was less than a one-in-two chance of a successful outcome. Given the dedication necessary to carry out a decent ganzfeld experiment, where it may take an hour in all to run just one trial, we can see that such a technique is still a long way from meeting the criterion of "repeatability on demand."

We might suppose that micro-PK would afford a more promising approach than free-response ESP given the enormous number of trials that can be run, using a random-event generator, in just one short session; but any illusions we may have on that score would soon be dispelled by an examination of the data that Robert Jahn and his associates at the PEAR (Princeton Engineering Anomalies Research) laboratory at Princeton have amassed since 1979 (Jahn and Dunne 1987). There the practice has been to use as subjects anyone willing to put in time at the laboratory. Unfortunately very few such subjects attain even a minimal level of significance at the termination of their sessions.

In asking, as I do in this paper, whether the skeptical position is *tenable,* one is, in effect, asking whether the criterion of "repeatability on demand" is reasonable. If it *is,* then not only must we forfeit psi but, equally, we must discard any psychological phenomenon that is not robust enough to pass this test. One can never know, of course, what discoveries may yet alter the situation; but, if history has anything to teach us, it is, surely, that psi is inherently elusive and evasive. Given the notorious decline effect, given the experimenter effect and the critical importance of situation and atmosphere, any prospect of arriving at a formula for routinely producing psi effects must seem hopelessly quixotic. On the other hand, there can be no question that, in the exact sciences—biology, chemistry, physics, etc.—repeatability on demand by qualified experimenters is, rightly, accepted as the appropriate response to any challenging new claim. Recently, when two scientists claimed to have produced cold nuclear fusion, they created a furor, not just because this would be theoretically so upsetting, but, ultimately, because others who tried their method failed (although, I gather, we may not yet have heard the last of this particular controversy).

"A 'de facto skeptic' is an empiricist who is willing, in principle, to abide by the evidence but is not satisfied that the evidence in this case is coercive."

The answer to our question, then, is that, by the standards of conventional science, the skeptical position *is* reasonable. Meta-analyses are important as guidelines for the future, but they cannot serve as a substitute for repeatability on demand. At this point, a further question arises. Is proof, by the conventional scientific method, the sole valid test of truth? We have only to ask this question to realize that this cannot be so. No sane person would deny that there is such a thing as historical truth. Yet, in the nature of the case, every past event is unique and so unavailable for inspection. But we have no problem authenticating historical claims on the basis of documents, artifacts, or other relevant evidence. Science, it has been said, deals with what *happens;* history (and, we may add, the Law) are concerned with what *has* happened. Experimental parapsychology purports to be a science, inasmuch as it deals with ongoing claims or hypotheses, but parapsychology as such—what used to be called "psychical research"—covers the entire gamut of human encounters with the paranormal. This includes innumerable spontaneous personal experiences, for which there is a rich store of well-documented cases going back to the late nineteenth century, as well as unique investigations of mediums or gifted subjects by experienced investigators. It would be fair to say, therefore, that parapsychology is to be considered one of the humanities as much as one of the sciences.

Assessing the Historical Evidence

The position of the skeptic with regard to historical and anecdotal evidence fluctuates between ignoring it as irrele-

vant and debunking it as flawed. The singularity of so much of the past evidence and the fact that it surpasses anything that we can lay our hands on today inevitably fuels suspicion. Furthermore, the fact that cheating of varying degrees has been a recurrent feature of parapsychological history further encourages the belief that, given time and patience, all such evidence will eventually yield to the charge of trickery or deceit. Some critics even jump to the conclusion that, if a psychic is once caught cheating, *all* the evidence from that source is tainted and can be summarily dismissed. But, however beguiling, such an inference is logically unsound. If an *experimenter* is caught cheating then, indeed, *all* the evidence for which that experimenter was responsible must be treated as suspect—as J. B. Rhine rightly treated the work of his protégé, W. J. Levy, after the latter's exposure. But, where the *subject* is concerned, the evidence can only be as good as the test conditions allow. If, when conditions are lax, the subject cheats, as Palladino used to cheat when she could get away with it, that may tell us something about the *morals* of the subject in question but it tells us nothing whatever about the authenticity or otherwise of evidence obtained when conditions were rigorous. Just as it would be manifest nonsense to authenticate paranormal claims simply because the subject in question had an impeccable reputation, so it is equally ludicrous to reject them because the subject is found to be untrustworthy. With respect to the *experimenter,* on the other hand, the position is quite different. In science we have to rely, pro tem, on the veracity of the experimenter, and so to invent or to falsify data is rightly considered the ultimate sin for a scientist. It is doubly so in parapsychology, where replication is such a problem. Actually, evidence emanating from a subject known to be a cheat should, if anything, carry *more* weight with us inasmuch as the experimenters involved could be presumed to have been that much more vigilant.

The only acceptable way of disposing of the historical evidence is to provide a possible normal counter-explanation, and some episodes from the past that had long stood the test of time have indeed succumbed to such treatment. The late Trevor Hall was, perhaps, the best-known exponent in recent times of this line of attack. However, for all his pertinacity and ingenuity, he sometimes failed to see that his conclusions ran up against certain fatal objections. He contended, for example, that the reason for Edmund Gurney's suicide was the discovery that his collaborator, G. A. Smith, had been deceiving him in their joint experiments, in which Smith had acted as hypnotist with subjects whom he had himself introduced (Hall 1964). This contention falls down not so much because there is every reason to think that Gurney's death was accidental (Coleman 1992) but because it is inconceivable that someone as conscientious as Gurney would not first have alerted Myers and the others at the SPR of Smith's deception, since they were still using him.

"It would be fair to say . . . that parapsychology is to be considered one of the humanities as much as one of the sciences."

Trevor Hall's most celebrated feat of debunking, however, is to be found in his earlier work, *The Spiritualists* (Hall 1962, 1984), in which he argues that William Crookes colluded with the medium Florence Cook, who in 1873 was purporting to materialize the phantom "Katie King" as a *quid pro quo* for her sexual favors. He bases this on an alleged confession Cook is reported to have made to a lover of hers many years after the event (the so-called Anderson testimony). Now, whatever one may think of this scenario, it ignores the fact that a second medium, Mary Showers, was invited to participate in some of these sessions. But, if the sessions were just a cover-up for his affair with Cook, the last thing in the world he would have wanted was the involvement of a second medium—with all the possibilities for blackmail that this would open up. More still to the point, having thus implicated Showers, why would he then have accused her of just the sort of impersonation for which Hall now accuses Cook? How, moreover, would he have dared to threaten her with exposure? It is she who would have threatened him.

We shall never know the truth of this extraordinary episode and we do not have to accept the paranormality of "Katie King"; but, if only for the reason given, we can be certain that it was not a case of collusion. And yet, on the basis of Hall's far-fetched speculations, skeptics like Antony Flew feel fully entitled, whenever the occasion presents, to declare: Crookes was a crook!

Having disposed of Crookes and of the early work of the Society for Psychical Research associated with Gurney, Hall, in the last book he published before his death, took on perhaps the most formidable challenge that confronts the historical debunker: the case of D. D. Home. Although his book *The Enigma of Daniel Home: Medium or Fraud?* (Hall 1984) purports to solve the mystery by demonstrating that Home was no more than an artful trickster, he nowhere gets to grips with any of the more impressive and intractable evidence. He has much to say, for example, about the Ashley House episode; but, as Dingwall (1987) points out in his review: "Hall has made no attempt to quote or analyze any of the more striking examples of Home's mediumship, such as his experiments with Crookes, the sittings in Holland in 1858, and above all the accounts related by very many sitters as to the lighting conditions which in many cases but not all make many of Dr. Hall's speculations untenable." Dingwall (to whom Hall pays fulsome tribute in his preface) concludes his review with the words: "The chief lesson to be learnt from this book is that

the enigma of D. D. Home remains an enigma, and there is no sign of it being resolved."

The hard fact, against which would-be debunkers can only bang their heads, is that for more than 20 years Home gave regular sittings, sometimes more than one a week, at which in good illumination (usually gaslight) a large table would be levitated to shoulder height or higher and that in no case was he ever detected, by any of the hundreds of sitters who attended these séances, using sleight-of-hand. Even Robert Browning, who loathed Home and whose satirical poem is still tiresomely cited when the name of Home crops up, confessed that he had no idea how it was done. Yet, unless all these witnesses, including the hostile ones, were concealing certain facts, the question still remains: How did he do it? The art of conjuring has made considerable strides since those days. Why has no contemporary conjuror recreated such a sitting for our entertainment and edification? I have indeed watched table levitations in television studios that I cannot explain, but Home, let us not forget, operated in private or hotel sitting rooms and usually at short notice.

Historical skepticism still has its devotees. Ruth Brandon's *The Spiritualists,* subtitled "The Passion for the Occult in the 19th and 20th Centuries" (Brandon 1983), is a fair example. I myself was once foolhardy enough to challenge skeptics to upset the Feilding Report of 1908 on Palladino (Beloff 1985). Sure enough, my challenge was, in due course, accepted, and we now have Richard Wiseman's account of how her phenomena might have been faked if she had arranged for a removable panel to be fitted to the door of the séance room at the Hotel Victoria in Naples through which an accomplice could enter and exit (Wiseman 1992). His ingenious hypothesis failed to convince those who were persuaded, on the strength of the general body of evidence, that Palladino was genuine. Nevertheless, in principle, this is the sort of thing that we need if historical skepticism is to be taken seriously, and *I salute Wiseman's skill and ingenuity* both in rising to my challenge and in facing up to his critics. Even if he could not quite nullify Palladino, he did at least draw attention to some serious omissions in the Feilding Report, hitherto regarded as a model of its kind.

Conclusion

We have seen that if what I have called the "skeptical position" is to be tenable it must apply not only to the latest experimental evidence but also to historical cases, some of which may indeed tax the credulity of those who would defend the former. In asking if the skeptical position is tenable, therefore, we must consider *both* sorts of evidence. We have already pointed out that if repeatability on demand is taken as the only safe assurance that we are dealing with a genuine scientific phenomenon, parapsychology cannot and may never be in a position to meet that goal, and hence skepticism with respect to the ongoing experimental evidence will always be an option. When we turn to the historical evidence, on the other hand, the mere failure of attempts at debunking does not constitute a guarantee that the phenomena in question were genuine; at most they imply a failure on the part of the historian to hit upon a tenable normal explanation. It is worth pondering that the late Eric Dingwall, who knew more, perhaps, than anyone about the history of this field, died an embittered individual, never able to make up his mind whether he was a believer or a skeptic. For, when all is said and done, one can never prove a negative. The fact that we cannot explain some puzzle can never be taken as proof that there is no normal explanation; it could just be that we have not yet hit upon the solution. In the end we must each decide for ourselves and then try to exercise tolerance. To conclude, the skeptical position is indeed tenable, but it is certainly not mandatory for all who regard themselves as rationalists. At all events, the opposition of skeptic versus believer is likely to persist into the foreseeable future.

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Why Faith in Anecdotal Reports?

JAMES ALCOCK

John Beloff's paper is thought-provoking. I find that I easily agree with a good deal of what he says, but find it very difficult to agree with some of the rest. He accepts, as I do, that the skeptical position vis-à-vis parapsychology is a reasonable one by the standards of conventional science. He accepts that the criterion of what he calls "repeatability on demand" has not been met. (Incidentally, that term of his could mislead: What is needed is a demonstration of psi that researchers in general can reproduce by setting up the specified conditions and following a specific procedure.) He sagely points out that while meta-analyses may serve as guides for future research and theorizing, they cannot serve as a substitute for repeatability. This flies in the face of what some other parapsychologists would have us believe.

However, Beloff obviously assumes that psi exists. (Were it not so, he would not come to the conclusion that psi is inherently elusive and evasive.) If one can accept this assumption, then of course there are all sorts of historical examples that can be given a paranormal explanation. It is such history that he argues provides a good reason for rejecting the skeptical position. I have great difficulty with this view, for I do not accept that "historical evidence" can substitute for scientific evidence when one is dealing with scientific claims (e.g., the existence of psychic phenomena), for such evidence is based generally on anecdotal (and often uncorroborated) accounts of unsystematic observation in uncontrolled circumstances. Furthermore, historical evidence reflects very much the Zeitgeist of the period and the corresponding mindsets of the observers.

Just because the historical accounts provide all sorts of evidence that people in the Middle Ages (who were culturally disposed to believe in witches) *believed* that they had observed witches flying through the air does not, for me at least, provide any compelling reason to accept that such beliefs corresponded to reality, or that such observations were accurate. And if people of impeccable reputation (in an era when spiritualistic belief was very widespread) were stymied by D. D. Home's demonstrations, this gives no indication as to whether the observers were deceived or Home's feats really were miracles. Unless our a-priori beliefs admit miraculous events, there is no reason to take a leap of faith (no obscure pun intended) to the position that paranormal powers are real, simply on the basis of such anecdotal accounts.

I thoroughly disagree with the further contention that the skeptic, before dismissing historical evidence, must be able to explain how apparent miracles were perpetrated back in history. It is not my duty to explain what people really saw when they thought they saw flying witches, nor can I be charged with the responsibility of explaining what Home did. For me to explain accurately how Home did what he was said to have done is not possible, since I have no access to the actual phenomenon, but only to the accounts of other people, long dead. These witnesses may well have missed key bits of information necessary to understand how Home did what he did even while working within the laws of nature as we know them.

I also demur when Beloff suggests that just because a psychic is caught cheating, this should not invalidate the observations made when he or she was not caught cheating—or worse, that evidence that he or she was caught cheating should perhaps increase our confidence in the results gathered during those times when no cheating was observed, on the basis that given that the researchers were aware of the tendency to cheat, they took precautions against it. A clear indication of a willingness to cheat tells me that the psychic is likely to try to fool the researcher in various ways, and that he or she may succeed in doing so, despite whatever precautions are taken. It is difficult to foresee all possible methods of cheating, and to claim that one has been able to rule out such cheating is presumptuous. The fact that someone was caught cheating should warn us to be very hesistant to accept any demonstrations by that individual. I have more faith in the ingenuity of clever tricksters than I do in the ability of well-meaning researchers to prevent all cheating.

I am surprised at Beloff's certainty that collusion can be ruled out in the case of Katie King. Again, all we have to go on is his-

torical anecdote, and such anecdote, it would seem to me, can rule out nothing.

In conclusion, I find it odd that someone so astute as John Beloff at perceiving the weaknesses and shortcomings of so much of parapsychological research, and that someone so forthright as Beloff in admitting that repeatability ("on demand") in parapsychology is a reasonable and as yet unsatisfied demand, should be so enamored of the anecdotal evidence from the past. It speaks to me of some kind of faith—faith that Home as a gentleman would not lie, or faith that careful observers would not be fooled, or maybe his overriding faith that psi exists. In the absence of solid experimental evidence, perhaps all that is left to support that faith is a levitated Home.

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Which Skeptical Position?

SUSAN BLACKMORE

John Beloff has asked whether the skeptical position is philosophically tenable. Quite rightly he recognizes that there is *not just one skeptical position* and accordingly outlines two. Yet I couldn't help wondering which one of these positions I hold, and I concluded that it was neither.

Like John, I am absolutely skeptical about some things, such as the telepathic powers of Father Christmas or levitation by the Tooth Fairy, but not about the paranormal, because I can imagine evidence that would make me change my mind. I am not a "de facto skeptic" in the sense he outlines, because the incompatibility of the paranormal with our scientific worldview is only one part of the reason that I doubt the existence of psi.

Far more coercive to me is the fact that believing in the paranormal *does not get us anywhere interesting*. If I believe that ganzfeld results were obtained because there was ESP between sender and receiver, then I have to use the psi "explanation" to account for those data. The same explanation may be used to account for similar data and extended to other claims, such as mediumship, spontaneous telepathy, group apparitions, and so on. Beyond this, the "explanation" will do little scientific work. It will not *predict the conditions under which* these things should happen, who should experience them when, why they are so rare, and so on. This "explanation" will challenge our views of matter, mind, and even time, but will not give us new or better ones. In other words, it is scientifically vacuous beyond its ability to account for the anomalies.

I may exaggerate, in that some theories of psi do make predictions (such as the observational theories), but the point is this: I am skeptical because believing in psi does not get me anywhere. I cannot seem to understand the universe, the data I collect, or my own mind any better if I admit psi. I want to understand OBEs and NDEs, apparitions and *lucid dreams. I ask myself* questions about life, the universe, and everything, and I have an open mind about what kinds of answers might be forthcoming. But in my experience, admitting the psi hypothesis does not help.

I am not waiting for even stronger evidence that psi exists. I am waiting for the psi hypothesis to reach the point at which believing in it does more scientific work than rejecting it. I do not think that *point has been reached, and* accordingly I am happy to call myself a skeptic about psi.

If ever it is reached, I shall become a believer in the paranormal. But I shall still be a skeptic—asking difficult questions and rejecting vacuous explanations.

This brings me to one final point. John concludes that "the opposition of skeptic versus believer is likely to persist." Let's try to make it otherwise. His own arguments show that one can be a skeptic and a believer at the same time. He is a believer about psi and a skeptic about alien visitors.

I am a believer about the life-changing power of NDEs and a skeptic about life after death and *NDEs involving psi. We don't need* to be in opposition.

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Historical Truth Is Not Exempt from Scientific Standards

RAY HYMAN

The skeptical position is tenable, according to Beloff, if we consider only scientific truth. Beloff concedes that the case for psi fails if we rely on the scientific evidence. However, he wants to find a rational basis for defending his belief in the paranormal. He therefore argues that historical truth is a suitable alternative for justifying belief in psi. This strikes me as question begging. If the scientific case for psi were stronger, Beloff would obviously have argued that the skeptic's position was untenable. Because he knows (believes, desires) that psi is real, and he wants to ground his position on rational grounds, he has to find an alternative to scientific truth. His choice of historical truth implies that it is an alternate way of knowing. I would argue that this is a false dichotomy. Historical truth is not an alternative to scientific truth. The trustworthiness of any historical account has to be based on the same considerations we use to judge the acceptability of a scientific account.

Beloff, along with other parapsychologists, points to the fact that Daniel Dunglas Home was never exposed as a challenge to skeptics. He writes, "The hard fact, against which would-be debunkers can only bang their heads, is that, for more than twenty years, Home gave regular sittings, sometimes more than one a week, at which in good illumination (usually gaslight) a large table would be levitated to shoulder height or higher and that in no case was he ever detected, by any of the hundreds of sitters who attended these séances, using sleight-of-hand." I see several problems with Beloff's attempt to use the "historical truth" of Home's alleged phenomena as a rational basis of belief in the paranormal. I cannot discuss adequately these problems in a brief commentary. Instead, I will simply point to a few difficulties.

Beloff says that "the art of conjuring has made considerable strides since those days. Why has no contemporary conjuror recreated such a sitting for our entertainment and edification?" Here Beloff reveals the peculiarities of his position. He assumes that the "recreation of such a sitting" has to coincide with the situation as described by contemporary witnesses. However, the subsequent research on eyewitness testimony, beginning with S. J. Davey's 1887 studies of malobservation of séance phenomena, makes it clear why the reports of Home's phenomena, no matter how dramatic, cannot be taken at face value. Beloff, for example, emphasizes that Home's sittings occurred in "good illumination." The "historical truth" is that the witnesses *claimed* that they occurred in good illumination. In his report on "The psychology of testimony in relation to the paraphysical phenomena" (*Proceedings, Society of Psychical Research,* 60, 1931-32), Theodore Besterman discovered that "sitters are able to only a very limited extent to report under what conditions of visibility a phenomenon took place." To demand that conjurors replicate Home's phenomena under the "same" conditions of "good illumination" is unrealistic if we do not know what these conditions were truly like.

More to the point is that in the same period during which Beloff says the art of conjuring has advanced, phenomena like Home's have disappeared. Skeptics might reasonably conjecture that we no longer witness such phenomena because we now know more about how they might be produced by trickery and we also know more about the proper conditions under which to observe and record such events. Skeptics might also guess that Home retired just in time to avoid possible detection by more sophisticated investigators.

Beloff's use of historical truth and Home's alleged miracles are an attempt to place the burden of proof on the skeptics. Whether Home, Geller, or any alleged psychic has been detected in fraud is beside the point. The burden of proof still rests with the proponents. By today's standards, neither the alleged feats of Home nor any other alleged paranormal phenomena have been proved by means of currently accepted standards.

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Is John Beloff an Absolute Paranormalist?

PAUL KURTZ

We should be indebted to John Beloff for his provocative paper, which helps us to focus on the differences between believers and skeptics. Beloff appraises the present state of parapsychological research and the skeptical objections to it. He rightly points out that, since the alleged experimental evidence produced has thus far not been sufficiently replicated in the laboratory, skeptics are dubious of that research. He wishes to focus attention instead on historical cases in which he believes paranormal phenomena have occurred. Skeptics find those historical instances so full of fraud and deceit and the eyewitness testimony so unreliable that they remain unconvinced. Unless we can explain how in every case Eusapia Palladino, D. D. Home, and other mediums produced the alleged phenomena, Beloff maintains, he is entitled to accept the paranormal account. But that places an insuperable burden on skeptical inquirers, demanding of them complete historical reconstruction, which is difficult to provide at this late date. If a paranormal phenomenon exists, says the skeptic, one needs to evaluate it under tightly controlled conditions of observation, whether in the past or the present.

I reject all forms of "absolute skepticism," for I do not think that one should reject parapsychological claims on the basis of a-priori logical analyses alone. The only meaningful posture is that of *de facto skepticism*. We need always to ask what the evidence is for a claim, however strange it may at first appear. Beloff mistakenly attributes absolute skepticism to me, even though I maintain that we need to be sensitive to such anomalies and be willing to modify our conceptual schemes in the light of them. We must be skeptical of a claim until there is sufficient evidence to support it. I have labeled this position "the new skepticism." Curiously, Beloff is willing to reject UFO reports on absolute skeptical grounds; I contend that we must remain open to the possibility, even probability (however slim), that we are being visited by extraterrestrials.

The critical issue, I submit, concerns the use of the term *paranormal* to account for alleged phenomena like "levitation," "PK," and "ghostly visitation." I do not think that these phenomena have been proved to exist, let alone that they are "paranormal." What is at issue here, I submit, is Beloff's metaphysical assumptions.

Beloff reveals his hand when he says that he is a "dualist-interactionist." What does this mean in concrete terms? That the "mind," "self," "soul" is independent of bodily processes? If so, are they contracausal or uncaused? What about paranormal events? Are they inherently mysterious and do they resist all naturalistic explanations? Are they thus occult? If so, Beloff appears to hold an *absolute paranormalist* view of reality. Is this not an article of unexamined faith, a form of the "transcendental temptation"?

What about the skeptic? Does he or she presuppose a physicalist metaphysics? One need not hold a reductionist physicalist view of the universe to do science. Although the phenomena that we encounter in nature appear to be basically physical/chemical in structure (I would say that this is a methodological rather than an ontological principle), there are different kinds of phenomena observable and different principles of organization required to explain them. For example, cognitive science demonstrates that cognition and perceptions are best dealt with on the psychological level, without behavioristic reduction, although naturalistic explanations are still available. The basic question is: Are *para*psychological phenomena over and beyond any naturalistic causal explanations?

Mr. Beloff: Can we leave aside preconceived metaphysical biases, examine the observed phenomena objectively (including strange anomalies), and evaluate them under strictly controlled conditions? That is the program of scientific inquiry, and it still seems to me to have merit as a way to unravel differences between believers and skeptics.

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Extreme Credulity

MARTIN GARDNER

Who can disagree with Beloff's admirable attack on absolute skepticism about psi phenomena? Of course PK (psychokinesis) is logically possible, and so is the existence of ESP. It is *logically* possible that the earth is a cube. Scientific assertions are on a continuum that stretches from almost certain to almost surely false, with all degrees of probability in between. The task of science is not to proclaim absolute, final truth about the universe but to evaluate, as accurately as possible, a claim's degree of credibility.

Beloff surprised me by his absolute rejection of the possibility that aliens are visiting earth in spacecraft. I would give this a probability of less than 0.00001, but to rule it out absolutely is a curious instance of unwarranted skepticism on the part of a man who believes Palladino was a genuine medium and that Home could levitate both tables and himself.

Beloff's latest book, *The Relentless Question,* concludes with five cases that he says no skeptic can explain: (1) A woman's left breast, totally destroyed by cancer, was instantly regenerated when a clod of earth from a saint's tomb was put on it. (2) Joseph of Cupertino, the "flying friar," who flitted above treetops. Beloff calls these aerial stunts "the best attested miracles associated with any religious figure in history." (3) The physical manifestations of the Boston medium Margery. (4) The Icelandic medium Indrid Indridason, who produced rappings, breezes, ectoplasm, and "unaccountable odors." (5) The Scottish medium Helen Duncan, whose spirit forms of the dead dissolved by sinking into the floor like the Wicked Witch of the West.

Beloff cannot believe in UFOs, but for a time he was enthusiastic about Uri Geller's spoon-bending and Ted Serios's power to project thoughts onto Polaroid film. I once asked Beloff if he thought that, if someone had suddenly turned up the gaslight while Home was floating near the ceiling, Home would have dropped to the floor. Quite possible, Beloff wrote, because darkness seems to play a mysterious role in such phenomena!

Absolute skepticism about psi is indeed untenable. It is defensible to insist that extraordinary claims demand extraordinary evidence. There simply is no extraordinary evidence for the wild psychic phenomena that Beloff takes so seriously. His difficulty, like that of so many of his colleagues, is that extreme credulity, coupled with a total ignorance of conjuring, has rendered him absolutely incapable of intelligently evaluating psychic claims.

As long as parapsychologists fail to devise an experiment repeatable by unbelievers, or to offer evidence commensurate with their extraordinary claims, the majority of scientists will remain de facto skeptics. In his book, Beloff derisively invented the term *Flewism* for Antony Flew's persistent skepticism. I have proposed the term *Beloffism* for the tendency of true believers to believe almost anything.

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Quoteworthy

The Victims of 'Psychic Detectives'

"[Jody] Himebaugh [father of a 12-year-old boy who disappeared in rural New Jersey in 1991] said no psychic ever asked him for money. But that is little solace. He thinks they were after something that was more precious to most of them—some kind of spiritual validation. 'They all say, "I'm not in it for the money"' Instead, Himebaugh said, the psychics exacted an emotional toll. 'They get this information, these visions, and then they want to know if it relates to my case or some other case, so they call me. . . . All this is what I go through.'

"Ivana DiNova of the Missing Children HELP Center in Tampa, Fla., said her introduction to psychics came 17 years ago when her teenage cousin disappeared. 'We had psychics call us, or they'd come over, and sometimes they'd charge the family money. . . . They'd say, "I see a street that starts with the letter C" or "I see the number 7." And you're trying to figure out what all that means.' DiNova is among those who would like to see psychics regulated. 'When the information they give families doesn't pan out, the family is literally devastated again,' she said. 'I feel deep down in my heart that they should be bonded and be held responsible for what they tell the families. They should have some group that monitors them.'"

—Dianna Marder, reporter,
Knight-Ridder Newspapers,
in a nationally syndicated
article, August 1994.

Mediumship: Is It Mixed Or Just Mixed Up?

GORDON STEIN

How should one approach the rationalization that catching a psychic or medium cheating is no reason to believe he or she always cheats? Here's a suggestion.

One of the things to which believers in the paranormal cling with tenacity is the idea of mixed mediumship. This means that a medium (substitute "psychic" or channeler today) can be caught cheating sometimes, but *may* still be capable of producing, and indeed may actually produce, *real* phenomena at other times. In other words, it is a plea, and a belief, that even though a medium has been caught cheating *that* is not enough reason to abandon all thought that he or she may be a genuine medium. It is just that sometimes he or she cheats and sometimes he or she doesn't.

When asked upon what grounds we should believe that someone who cheats is only cheating *sometimes* the best answer I have been able to obtain is that it is all a matter of show business. Mediums are basically entertainers. Their audience wants to see, and often has paid

to see, a performance. If the medium is not in good form on a particular day, the audience must not be disappointed. Therefore, the medium cheats.

One could counter that an honest person would not do this, but rather would simply tell the audience that he or she was not in good shape to perform that evening. Even if the audience's money had to be refunded, that kind of a statement would be what an honest person would do, and it is greatly preferable to cheating for the sake of pleasing the audience. The fact is that *if the audience knew* the medium was cheating, they would be quite upset with the performance—more upset, in fact, than if the medium were unable to perform at all. Nobody likes to be cheated, except by a known conjurer when we dare him or her to fool us.

James Becker

I would like to suggest a better approach to this whole matter, one that I have hinted at before in print (Stein 1992) but that has never before been spelled out in detail. I refer to a principle, adopted from the law, that says: Treat everyone as innocent until proved guilty; but once someone has been shown to be guilty (i.e., to have cheated), then shift the burden of proof from the observer to the medium, and from then on make the medium show that *anything* he or she can do is *not* due to cheating.

What does this mean in a practical sense? It means that once a medium has been caught cheating, tighten the controls. Treat him or her as if he or she *always* cheats. Make the controls so tight that cheating simply *cannot* occur. If the phenomena continue to occur, the medium is vindicated from charges of cheating, at least for now. If the phenomena no longer occur, perhaps an initial conclusion can be made that there had been no genuine phenomena. Of course further testing, still maintaining the stricter controls, is required.

Does taking the position outlined above (namely, assuming the medium to be guilty) treat the medium unfairly? Does it hold a person to be guilty this time because he or she was guilty previously? The idea that a person's past criminal record is inadmissible during a trial for another offense comes to mind. However, this is not an analogous situation because the "offenses" here were not unrelated previous ones, but tests of the same phenomena under similar conditions at an immediately prior time. It's as if they were additional trials in the same test. Besides, there is no finding of guilt the second time, but merely a tightening of conditions so that if there *is* guilt, it will become more obvious.

Perhaps the most notorious case where mixed mediumship was claimed was that of the Italian medium Eusapia Palladino. Her mediumship flourished from 1885 to 1915. During that period she gave hundreds of séances and was caught in blatant fraud a number of times. Most of her phenomena were repeated over and over. The standard ones were levitation of a small table, raps, sitters' being touched by a hand, curtains of the "cabinet" billowing out, luminous forms flitting around the table, and chairs or other objects being moved. Many famous people sat in Palladino's séances. Among them were the Italian physician and criminologist Cesare Lombroso, the Nobel prize-winning physiologist Charles Richet, and almost all of the psychic investigators of the late nineteenth and early twentieth centuries (Carrington, Feilding, Aksakoff, the Sidgwicks, Lodge, Myers, et. al.). Many of them were totally convinced of Palladino's ability to produce paranormal phenomena, even *after* she was convincingly caught *several times* using her foot to levitate the table and having freed one of her hands from "control."

At the same time, it must be admitted that there is much testimony stating that some of the effects seen could not have been produced by merely the free hand or foot of the medium. Hereward Carrington, Palladino's strongest defender and later her manager, spelled out what justified, to him, saying that

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someone who cheated could also sometimes be authentic. He did this in his book *The American Séances with Eusapia Palladino.* Carrington's (1954: 7-8) response was that the medium may have cheated on occasion because: (1) real psychic abilities are dependent upon an "inner energy over which she had but little control" and, if it was weak, she had to resort to cheating if she was not to disappoint sitters. (2) Palladino took "a mischievous delight in seeing how far she could go in hoodwinking her sitters." In other words, she cheated just to see if she could get away with it. (3) Palladino had a great deal of vanity and thought of herself as someone who could never fail to deliver. When she couldn't deliver authentically, she cheated. (4) The production of "genuine" phenomena exhausted her, while artificial ones did not, so the cheating was done to save energy. (5) During semi-trance, she "had a strong impulse to move her physical hand or foot and with it produced the required phenomena." In other words, she cheated because of an irresistible impulse.

Eusapia Palladino, whose mediumship flourished from 1885 to 1915.

Let's examine each of these in turn.

First, the desire not to disappoint sitters is a noble one, but if it involves cheating, it implies a lack of integrity on the part of the medium. While "the show must go on," there are many people who would feel *more* cheated and disappointed if they knew that the medium was faking it than if the medium honestly said he or she was unable to produce anything that time. In addition, we have no evidence whatsoever that psychic abilities depend upon some inner energy beyond the medium's control.

Second, trying to see how much you can hoodwink the investigators is not a helpful attitude when serious investigators are trying to conduct serious research. It obstructs any serious investigation. When we realize that Palladino was being *paid* for her participation in these séances, we move into the area of criminal fraud.

Third, the idea that vanity was involved simply will not wash when we consider the fact that Palladino often did *not* deliver. One explanation for this failure on occasion was that the controls then were simply too strict, not allowing any cheating. An alternative conclusion that would support the vanity idea simply does not work. Why wouldn't she simply cheat any time she couldn't produce?

Fourth, while it is true that the séances often *did* exhaust Palladino physically, she would often stay later and produce additional manifestations after many of the sitters (the ones she didn't like?) had left. It seems that her feelings of exhaustion dissipated rapidly.

Fifth, the "irresistible impulse" idea makes little sense. If she really wanted to fight that impulse, and was capable of producing genuine phenomena, then she did not need the use of her hands and feet to produce those phenomena. Why, then, was she so intent on freeing her hands and feet from control? The statement that her hands and feet were necessary for the phenomena is false, and so the rationale for her needing to free them is also false.

So, none of the five reasons given by Carrington in justification of mixed mediumship as a true state of affairs is very good. Perhaps there is no real justification for the existence of mixed mediumship. I would like to suggest an alternative.

When fraud is found, should there be a feeling of "leniency" toward the medium? By that I mean is it reasonable to even assume that there may be times when the medium can produce the same effects obtained by fraud, in this instance, by *real* paranormal powers at other times? We can obtain some needed perspective on this question by looking at the case of the medium who is always fraudulent. This is a nameless example, not a specific case. Here, we have a medium who may take the position (often actually taken by mediums) that, yes, he did do things fraudulently at times but, yes, there were other times when his powers were genuine. Indeed, with this hypothetical medium there were some times when phenomena did occur and no fraud was detected. Was this simply a case of inadequate controls, or is it possible that even our hypothetical medium (who, remember, I said was always fraudulent) was able to fool the investigators at times?

Since it is not inconceivable that even a totally fraudulent medium could fool investigators at times, it would seem that allowing the claim of "fraudulent sometimes, genuine at other times" opens the door to possible wrong conclusions on the part of the investigators every time they relax their controls on a fraudulent medium. Wouldn't it be wiser from the point of view of accurate conclusions to simply tighten up the controls on any medium caught in fraud? If the phenomena continue, perhaps there are some genuine ones. If the phenomena stop, then the medium is probably always fraudulent.

John Beloff (1991), who seems to have written the only other article on this subject, feels that each test of a medium is a separate one, so previous results should not enter into consideration of the actual events occurring in the present test. He is only partially correct, since past evidence of fraud should enter into the design of the present experiments. They should be as fraud-proofed as possible, with the type of past fraud being used as one of the major considerations in tightening the design.

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A Young Grand Canyon?

TIMOTHY H. HEATON

A university geologist critiques a creationist geologist's arguments that the Grand Canyon in particular and the Earth in general are not as they seem to science.

Growing up in Utah, I found the desert canyons of the Colorado River drainage to be among my favorite places to visit, and they in large part led me to my career in geology. The scenery of the Four Corners area is spectacular, but it is also instructive because of the unparalleled exposures of sedimentary rock. Upon hearing as a teenager that the earth was very old, it immediately occurred to me that the deep erosional canyons of the Southwest demonstrated this. Try as I might, I could find no satisfactory explanation for the vast canyons and plateaus other than long-term erosion. As I later became an active hiker and caver in the Grand Canyon and began my training in geology, my early impressions were confirmed by much more careful analysis.

I was startled to learn as a graduate student that the Institute for Creation Research (ICR) had begun taking

tours through the Grand Canyon over Easter and using this setting to teach that the earth is only a few thousand years old. I could scarcely imagine what kind of strange indoctrination was taking place as creation-hungry Christians were being tutored by the ICR staff in a balanced blend of arm-waving geology and prayer. Feeling that a heresy was being perpetrated against my childhood playground, I decided to investigate. The primary geologist behind this effort was Steven A. Austin, chairman of ICR's geology department and the editor and primary author of the new ICR book *Grand Canyon: Monument to Catastrophe.* Upon request, he sent me a preliminary manuscript outlining his theory that the Grand Canyon formed in a single flood event, along with his other publications. I replied with a long list of obvious objections to his theory, to which I received a respectful reply.

Austin bears little resemblance to his rhetoric-bound mentors, Henry Morris and Duane Gish. Ronald Numbers, in *The Creationists* (Knopf, 1992), describes him as the first great success story of a creationist getting through a graduate program in geology without losing his faith in a young earth (quite a feat in my opinion as well). Austin has done extensive research on catastrophic processes and has found that many geologic features once thought to require vast periods of time to form can in fact be replicated by short-term events. In his article "Uniformitarianism—a Doctrine that Needs Rethinking" he outlines the misconceptions of Charles Lyell, the father of modern geology, and shows how uniformitarian thinking has become a misapplied dogma in many cases (the Channeled Scablands of Washington State being a classic example). I concur with this analysis, as do many geologists. But Austin has swung so far to the opposite extreme that he can't see long-term equilibrium even when it's staring him squarely in the face. His attempts to explain every geomorphic feature as a relic of past process leads to some rather humorous and incomprehensible logic.

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Grand Canyon: Monument to Catastrophe. Edited by Steven A. Austin. Institute for Creation Research, Santee, Calif., 1994. 248 pp. Paper $19.95.

Grand Canyon: Monument to Catastrophe, with its presumptuous title, was produced as a guidebook for ICR fieldtrips and as the official ICR explanation for "the world's greatest natural wonder," an alternative to the endless list of scientific and National Park Service publications that teach that the Grand Canyon is a monument to time. The book begins with a theological chapter. The biblical doctrines of a six-day creation, death originating with the Fall of Adam, and the worldwide Flood of Noah are expounded, and special emphasis is placed on Apostle Peter's prophecy that in the Last Days people would deny these doctrines. This creates a logical fallacy because, if uniformitarian geologists are set up as the mere fulfillment of biblical prophecy, then their ideas will of necessity be rejected even if they are entirely correct! Such a starting point leads an otherwise rigorous, scientific book in a direction it cannot avoid. The second chapter and part of the third, in contrast, could almost have been lifted from an introductory geology text. Principles of sedimentation and cross-cutting relations are explained as well as the interpretative framework needed to evaluate data. Clearly the authors intended to fit their theories as best they could within the modern scientific framework.

I will focus on the four chapters in which Austin attributes the Grand Canyon's deposition and erosion to recent Flood-related events. The Precambrian rocks he considers pre-Flood, but the 4,000 feet of Paleozoic rocks exposed in the canyon he attributes to Noah's Flood because they contain fossils (evidence of death). In discussing these rocks Austin dives headlong into agonizing detail concerning esoteric geologic disputes, such as the source of certain sandstones, the origin of shrinkage cracks in mud, and the presence or absence of sedimentary hiatuses. Each point is well documented from every perspective, but the emphasis is to cast doubt on classic interpretations involving long-term deposition. At the end of each dispute Austin makes a brief comment on how the Flood provides a good explanation for that feature, then he quickly moves on. For example, a nonrandom orientation of 12 nautiloid fossils is used to show that they were deposited in moving rather than still water. Throughout the discussion Austin makes a special point of rebutting the uniformitarian ideas of Davis Young, a Christian geologist and critic of the young-earth creationists.

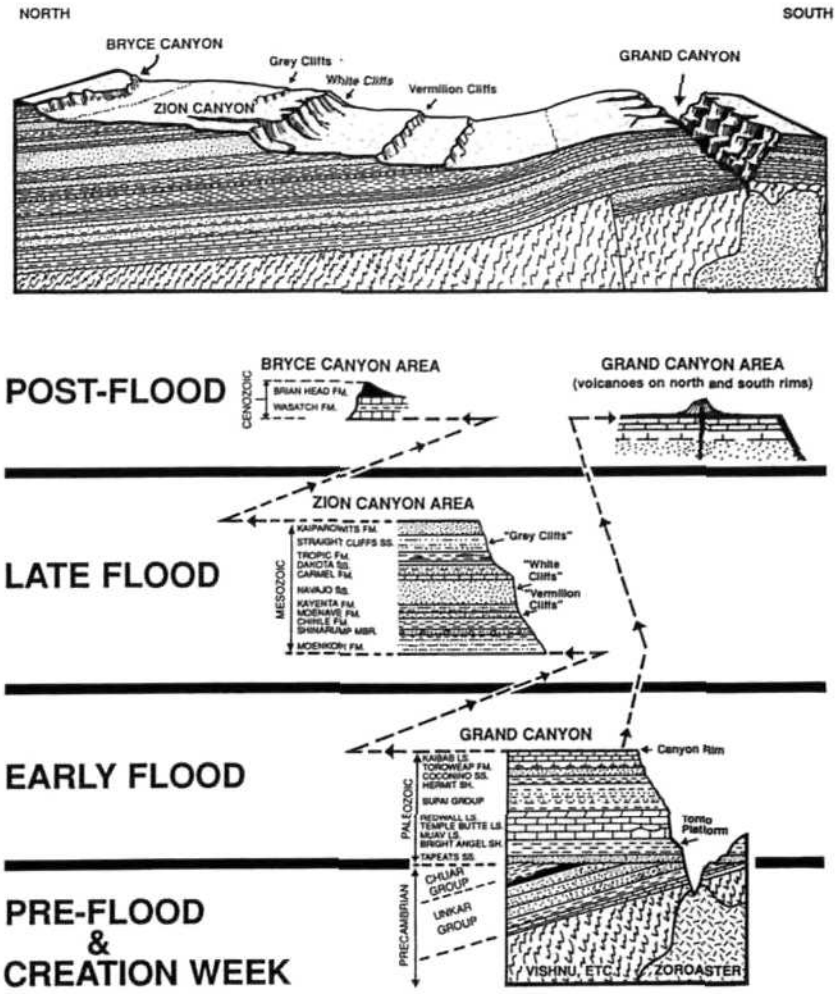
Many of Austin's arguments take advantage of the fact that he is only studying a single region of the earth. For example, by documenting that there are no undisputed reefal limestones in the Canyon, he is able to explain all limestones as carbonate grains reworked by the Flood. The fact that classic reefs of equivalent age are found in nearby New Mexico is never mentioned. Another strategy has to do with scale. He points out the widespread distribution of sedimentary formations and attributes them to a vast flood rather than local coastal environments. But a global flood should produce worldwide sedimentary units, and those in the Grand Canyon cover only a minuscule area compared with the whole earth. Austin also asks why there is so little bioturbation of Grand Canyon sediments if they were deposited over millions of years, but a better question would be why there is any bioturbation at all if the sediments were deposited during a rapid flood. How he can attribute the overlying Mesozoic rocks, famous for their dinosaur trackways, to late in the Flood when all animals outside the Ark were supposed to be dead is even more mysterious. The book never even addresses the single most obvious problem with Flood geology: that the sedimentary rock record is composed

of thousands of distinct fossil zones in unvarying order. Austin uses fossils where they suit him, however, such as attributing logs in Petrified Forest National Park, just east of the Grand Canyon, to Flood driftwood!

For the most part Austin's research is rigorous and deserves praise, but in the end his logic fails on a count that is typical in creationist literature: he never presents a comprehensive theory of how the Flood took place, where the water came from, or how or from where it moved sediment to form the rocks of the Grand Canyon. In fact, most of these vital issues are never even mentioned! A single diagram is given showing inundation and supposed zones of sedimentation (suspiciously similar to a classic marine transgression but presumably occurring much faster), but this raises far more questions than it answers. Without a comprehensive theory of the Flood there is no way to make a scientific comparison of any kind, so pointing out esoteric problems in the classic theory is trivial and *very* misleading.

Austin doesn't attribute the carving of the Grand Canyon to Noah's Flood, but he considers it a catastrophic event occurring in the Flood's aftermath. Here again he takes rich advantage of geologic disputes.

The Grand Canyon is as deep and spectacular as it is because a major river has eroded through a plateau that has been uplifted by two sequential mountain-building events. The Canyon opens on the east as the Colorado River crosses the East Kaibab Monocline, a Laramide fold structure considered to be about 70 million years old. The Canyon ends on the west where the river crosses several faults at the edge of the Basin and Range province that have been active for about the past five million years. This creates semantic confusion as to how old the Grand Canyon is, and Austin makes his readers as confused as possible. He asks where all the sediment is if the Colorado River has been carrying its current load for 70 million years, but this is a meaningless question since it has probably been carrying this high



Geologic cross-section through Grand Canyon region, showing different rock units and Steven Austin's creationist-strata interpretation. (From *Grand Canyon: Monument to Castrastrophe*)

load for only two minor intervals during this period.

The big question Austin raises, which has been raised by others, concerns antecedence. An antecedent river is one that was flowing before an uplift formed and was able to erode at the pace of uplift, thus creating a deep canyon. Most deep canyons are attributed to antecedent rivers because, in most cases, no other explanation makes any sense. Rivers seek low ground, not mountaintops. Rivers can, however, be captured and thus change course, and this appears to have happened at Grand Canyon since some young lake sediments are found near its west end. Course changes of this type are most likely to occur just as uplift begins, since softer rocks form gullies that are capable of capture, and deep entrenching is yet to occur. The Grand Canyon can best be explained by antecedence with the caveat that some change in river course occurred west of the East Kaibab Monocline at the beginning of Basin and Range faulting, a view well presented by Ivo Lucchitta in *Grand Canyon Geology* (Oxford University Press, 1990). Austin, however, presents the antecedent and capture hypotheses as two distinct, outdated theories that need to be discarded. In their place he presents a theory of catastrophic flooding that makes the problems of antecedence and capture look trifling in comparison, but, as before, his theory does not receive the same scrutiny as the others.

In brief, Austin postulates that two large lakes breached a dam created by

the Kaibab plateau, thus eroding the Grand Canyon in very short order and establishing the present drainages of the Colorado and Little Colorado rivers. The fact that overland flow would have circumvented the Kaibab Plateau, rather than penetrating it, led Austin to postulate that the first lake failed by enlargement of an underground conduit. The theory that catastrophic flooding formed the Grand Canyon is not new to creationists, but Austin has expanded the model and radically compressed the time frame to fit his theological views.

How would we go about testing such a theory, especially when all direct evidence has been washed away? Testing for a flood has its problems, especially if it occurred long ago, but testing for a recent origin of the Grand Canyon by flooding is a simple matter. The question to answer is whether the Colorado River, its tributaries, and the slopes of the canyon walls are in an equilibrium state (i.e., whether they would have the same basic configuration if left to current erosion processes for an arbitrarily long time). Nonequilibrium drainages can be found wherever glaciation, catastrophic flooding, or other nonstream processes have recently dominated. Such "deranged" drainages are typified by numerous lakes, U-shaped valleys, and waterfalls where tributaries enter a river. In equilibrium drainages the tributaries, even washes that only rarely carry water, meet the river exactly at its level, and slopes are controlled primarily by the hardness of the rock units. Is the configuration of the Grand Canyon in equilibrium or relectual? Unquestionably it is the former. Given a million years of current conditions there would be considerable slope retreat, but from all we can tell the general appearance of the Grand Canyon would be virtually identical to what it is now.

Austin cites the Channeled Scablands of eastern Washington State as evidence that catastrophic flooding and rapid scouring of bedrock can occur, and appropriately so, but he fails to note the radical differences between the features created by the Lake Missoula floodwaters and those of the Grand Canyon. The narrow inner gorge of the Grand Canyon and its equilibrium tributaries are the antithesis of the broad floodplain, multiple overflow channels, and gigantic "ripple marks" of the Channeled Scablands. It would be hard to imagine two canyons more geomorphically dissimilar to one another.

Much more could be said about the ideas presented in this book, it being an easy target for critical analysis. Many readers may even consider it unworthy of a response. I disagree. For a young-earth creationist book it has reached a new level of scholarship, and as such it provides a new opportunity to evaluate an old idea. Although my review has been critical, I want to assure my readers that I've tried my level-headed best to see things through Austin's eyes in hopes of finding some spark of internal consistency and insight previously missed in a catastrophist model of earth history. But having made this attempt with no enlightenment, my childhood view of an old earth and long-term erosion seems more logical than ever.

After corresponding with Austin and other creationists and reading their works, I have no doubt that they believe in their convictions. They have frequently been called dishonest for their blatant flaws of logic, but this is perhaps a trait of human nature common to us all. Belief in a young earth by a trained research geologist is mostly a testimony to the strength of religious faith. Why certain Christians give the Bible the authority they do and why they interpret it so rigidly is hard for the skeptic to understand; but given that this is so, it is interesting to see the efforts to which people will go to make things fit.

Many readers may find this book especially threatening because of its mix of scholarship and creationist dogma, targeted to a natural monument of great popularity. I like to look on the bright side. Scholarship is more likely to lead to rational discussion than pure rhetoric, so why not take the opportunity to discuss these scientific issues with our creationist colleagues? Only by breaking down the invisible walls that separate us can we hope to understand one another and find areas of agreement on which to build. I was pleased to see that the authors of this book break rank with much of fundamentalist Christianity by taking a pro-conservation stand on the environment. Maybe this is the place to begin. □

Quoteworthy

"The producers of 'The Other Side' (Four Point Entertainment Inc.) [a new show on NBC-TV] evidently determined that the time was ripe for a new kind of morning show to combat the medium's neglect of out-of-body experiences, psychics, UFOs and how-our-government-is-conspiring-to-hide-the-truth-about-them. . . . Clearly the show, like the daytime talk-freak shows generally, is based on the calculation that its audiences will believe any story put before them, however outrageous, if presented with passion and conviction. . . . The arrival of this show—worse, in some ways, than the standard morning assortment of sex addicts, molesters with multiple personalities, and other lunatics—is, in short, not good news. Trial defense lawyers, further, would do well to pray nightly for a jury pool consisting of people devoted to programs like this, people nurtured in the belief that every claim is possible."

—Dorothy Rabinowitz, in a review in the *Wall Street Journal*, November 14, 1994

Ancient Aluminum? Flexible Glass?

Looking for the Real Heart of a Legend

GERHARD EGGERT

The story has hardly been well-enough authenticated to warrant the publicity which it has long received.

Pliny, *Natural History,*
Book 36, para. 195

This incredible story is still being repeated and amplified even after almost 2,000 years. Is there any basis for it? What accounts for its longevity?

Do you like strange stories? What about one with ingredients like an inventor of genius, flexible glass, a tyrannical emperor, and a surprising end? The story, so critically commented upon above by the Roman encyclopedist Pliny the Elder (Gaius Plinius Secundus, A.D. 23-79), "who was besides not unduly skeptical" (Trowbridge 1930), has it all. And more: According to the editors of Time-Life Books (1990) in their *Feats and Wisdom of the Ancients,* the story could be about aluminum. If true, then certainly "the ancient metalsmith was centuries ahead of his time."

Are you curious about it now? Here is the detailed version given by the contemporary Roman author Petro-

nius in his *Satyricon* (chap. 50, para. 7, to chap. 51, para. 6), where inserted in a conversation on metal tableware the swank Trimalchio boasts:

> Personally I prefer glass; glass at least does not smell. If it were not so breakable I should prefer it to gold; as it is, it is so cheap. But there was once a workman who made a glass cup that was unbreakable. So he was given an audience of the Emperor with his invention; he made Caesar give it back to him and then threw it on the floor. Caesar was as frightened as could be. But the man picked up his cup from the ground: it was dinted like a bronze bowl; then he took a little hammer out of his pocket and made the cup quite sound again without any trouble. After doing this he thought he had himself seated on the throne of Jupiter, especially when Caesar said to him: "Does anyone else know how to blow glass like this?" Just see what happened. He said not, and then Caesar had him beheaded. Why? Because if his invention were generally known we should treat gold like dirt.

Pliny (*Nat. Hist.*, bk. 36, para. 195) relates the story in a matter-of-fact manner:

> The tale is told that, during the reign of Tiberius, a glass was devised, so compounded as to be flexible, and that the workshop of the inventor was utterly destroyed, lest there should be a decline in the value of copper, silver, and gold.

The story must be seen in its historical context in the first century A.D. The rather new invention of glass-blowing spread at that time, and glass vessels became readily available, competing economically with luxury metal tableware (Pliny, *Nat. Hist.*, bk. 36, para. 198; Forbes 1957: 170-171). Should the new decolorized glass of crystal-like appearance have had the desired metallic properties (fracture strength, forming by cold work), then the market for metal tableware would have totally broken down.

In the Middle Ages, this fascinating story was often repeated (Trowbridge 1930: 112). Alchemists searched for the secret of malleable and flexible glass in pursuit of perfect matter (Kunckel 1689; Ilg 1873: 133-134).

Ancient Aluminum

Where does the idea that the story is about aluminum come from? Every encyclopedia dates the discovery of aluminum to the nineteenth century, so the existence of Roman aluminum is certainly an extraordinary claim.* So, what about the necessary extraordinary proof? Although Time-Life correctly gives Pliny and Petronius as sources and cites them speaking of glass, its version of the story clearly contains fakes, as is easily revealed by direct comparison. Time-Life calls the craftsman a "metalworker" and says the material of the cup "looked like silver but was much lighter" and "was extracted from clay—just as aluminum is." All these claims are fabrications that have nothing to do with the original story. Based on these and not, as it falsely claims, on Petronius's and Pliny's descriptions, the Time-Life book says, ". . . however, modern experts have speculated that it [the cup] might have been fashioned from aluminum." Invent citations and you certainly have a lot to speculate about!

Of course the Time-Life editors did not do it themselves; they got their version thirdhand. By a search in libraries, I traced this account back to Henri Sainte-Claire Deville (1818-1881), the founder of the industrial production of aluminum. His "silver from clay" was shown at the World Exhibition in Paris in 1855. In 1864, during an evening lecture at the Sorbonne, he told his audience that he had had a Roman predecessor. He cited a General de Béville verbatim, who had "discovered it in many latin texts" (Menault 1864). From this quotation, de Béville's intentions are obvious. He did not only try to flatter the modern aluminum producer for reviving an ancient Roman tradition. He also contrasted the tyrannical ancient Roman emperor Tiberius, who suppressed the invention, with the modern French emperor Napoleon III, who acted as a patron of the technical innovation.

De Béville's idea to relate the story to the production of aluminum might come from a misinterpretation of Petronius's expression *aurum pro luto habere* (literally: to have gold as dirt). The Latin word *lutum*, which means either dirt or clay, is here (and in other passages of the *Satyricon*) used in a comparison as an example of something totally valueless. De Béville possibly interpreted the word as indicating that the vessel itself was made from clay. In his mind, what else could the material of the vessel be? It behaves like a metal and competes with gold and silver, as "silver from clay," i.e., aluminum? A nice anecdote, indeed, perhaps intended to cause a smile and not be taken seriously. Later readers apparently did not understand that—and so the story of Roman aluminum was born. And there is one lesson of experience with such stories: Once promulgated, they never go away.

One simple. question was forgotten by all advocates of ancient aluminum: How did the Roman craftsman produce it? Although there are claims in connection with Chinese finds (Needham 1974), no repeatable method has been demonstrated using known ancient technical skills for the production of aluminum or its alloys in the gram-size lumps necessary to form artifacts from them. Despite Time-Life's listing of a large number of editorial researchers, special contributors, correspondents, and consultants, no one has attempted just looking at

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*There are also claims of ancient Chinese aluminum (see Editors of Time-Life 1990:26, and Needham 1974), not under investigation here. As opposed to the purported Roman aluminum, they refer to real objects and can therefore be taken more seriously. However, the analyses, the dating of them as ancient, and the speculations on production methods are not beyond every reasonable doubt.

what Pliny or Petronius really wrote or what the background of their not "surprisingly true," but unsurprisingly untrue version is.

Perhaps, Time-Life editors are less to blame for what they included than for what they missed—the real wonders of science and archaeology. As has been shown recently (Craddock 1990), there is, indeed, a strange metal known to some ancients whose secret of production was lost during the ages, at least in Europe: zinc. A true feat of the ancients!

Thermally Toughened Glass

Clearly, Pliny and Petronius were speaking of glass, and the later repeaters of the story understood it just the same. Even the first glass technologists, living in the seventeenth century, did not believe in the malleability and flexibility of glass vessels, because of their own experience with that brittle material and despite the alchemists' claims (Kunckel 1689). Their modern colleagues will certainly agree. But what about the fracture strength? Although one cannot render glass unbreakable, its strength can be improved, e.g., by thermal toughening. When the first method to quench red-hot glass (in oil of 200-300°C) was patented in 1874, the new "verre trempé" reminded H. E. Benrath (1875) of the old story of Pliny and Petronius. Von Lippmann (1897) even drew a parallel with the hardening of steel, a process done similarly and well known to the ancients. A crucial step was taken recently by Rottländer (1990), when he connected the old story and the modern technique with a definite group of Roman glasses found in Cologne. They appeared to have broken during burial into tiny pieces that lay close together. Archaeologists remembered at first sight the fracture pattern of thermally toughened glass, but a closer look can reveal the characteristic differences of the craquelé pattern. Long-necked Roman bottles, which unlike open forms (sheets, plates, and cups) could not be toughened thermally even today, have the same craquelé patterns, most likely due to corrosion during burial.

All other evidence in favor of the hypothesis could be refuted in a detailed study (Eggert 1991b) as well. Therefore, it has been concluded that "hitherto no one has presented unquestionable scientific evidence for Roman toughening of glass" (Eggert 1991a).

What Else?

If not aluminum or thermally toughened glass, what else could it have been?

Other scientists, other speculations! Even Pliny himself, by referring the unusual properties to a special composition, implicitly makes an assumption on the technical background. However, up to now there has been no glass composition with properties similar to those of the one purportedly shown to Tiberius.

Broken like thermally toughened glass? Craquelé on a Roman glass fragment from Flertzheim, Rhineland. Scale in cm. (Photo: RLMB/H. Lilienthal)

According to Muspratt (1858), the vessel was therefore not made from glass but possibly from molten silver chloride, which is a little transparent and plastic. Unfortunately, although silver chloride is a frequent corrosion product on silver objects excavated from salty soils, no Roman object deliberately made from molten silver chloride has been found up to now.

Ilg (1873) critically discusses the idea that the Latin word *vitrum* here means enamel instead of glass, but concedes that this, too, would not explain the malleability.

Mellor (1964) says that the story *"recalls the Delhi flexible sandstone."* But this can only be taken as an analogy ("recalls"), not as an explanation, because the interior microstructures of glass and sandstone are totally different.

Kisa (1908) connects the alleged flexibility of the glass vessel in the story with fun glasses known from early modern times having a spiral cut into the thin walls. When filled they hold liquids, but, because of the slight flexibility of thin glass, they leak when the rim and the bottom are drawn apart. Even if Roman glass-workers knew this nice trick, one should have found relics of such objects. And, of course, this glass would not be malleable, as Kisa himself admits. By the way, he has an interesting suggestion as to the origin of the idea of malleable glass: a layperson, not knowing the new technique of glass-blowing, might imagine that *form-blown glass with reliefs* would be produced similar to their hammered metallic counterparts.

Forbes (1957) is aware that the story cannot be literally true. In his eyes, "it is more probable that *flexile* refers originally to nothing more than the production of 'bent' hollow ware, with 'bent' handles, in 'stony' glass, for the ancients often classified glass with stone." The story then became inconclusive, because such glass was— obvious to the audience in the first century

A.D.—frequently produced, so no such invention was lost.

Bailey's speculation (see Pliny) is perhaps the most entertaining one. He commented upon the similar version of the story given by Dio Cassius in his *Roman History* (bk. 57, chap. 21, para. 7), where the inventor repaired the glass with his hand: "Tiberius had him put to death, and we may conjecture that he had found him out to be a conjuring impostor." A true story about a false trickster?

Altogether, these speculations form an impressively long list of possibilities. But by weighing up the evidence, one can only agree with McDermott (1962): "The anecdote, its later versions, and the problem of flexible glass have been much discussed with little result."

Just a Good Story

Despite Pliny's critical comment it seems that all authors looking for explanations implicitly made conclusions like this: the "story had been repeated so often, that one at last has to believe in some true heart" (Neuburger 1919). This kind of false reasoning is very well known to skeptics. Be it extraterrestrial UFOs, Noah's Ark, or the Yeti: the number of "sightings" is taken as evidence by believers that there must be at least "something," despite the bad factual quality of the individual observations throughout.

If not because of its "truth," why then was the story retold again and again for almost 2,000 years? The trivial explanation missed so far by all the scholars and scientists: Consider the main characters, look at the plot—it is just a good story! An inventor is surprisingly, but convincingly, punished for economic reasons instead of being rewarded as expected, and the invention is discarded.

Certainly, like modern urban legends, an interesting story might appear in very different versions. Twenty years ago I heard the following: an inventor filed a patent on a razor blade that would never become blunt. He sold his invention to a big company for a share in the sales of that type of blade. But the company didn't start production, so as not to lose the market for its normal blades. The man therefore died poor. Despite the modernizing changes (another invention, a big company taking over the role of the tyrant, not getting rich instead of capital punishment), this is essentially the old story.

Tales that the breakthrough of an invention is prevented by conspiracies are quite frequent today, see, e.g., the rumors on green-powder inventor J. Andrews's death (*SI*, Fall 1993, p. 20).

Stories might be true or false; perhaps the most fascinating and remarkable ones are those where you do not know exactly which, as in the case of still not knowing today of the possibility of manufacturing razor blades that remain sharp for a long time. (There may be better methods than to put them inside a pyramid!) The ancients might have thought similarly of glass with unusual metallic properties. What a challenge it is to our human endeavor to search for the truth in such stories.

Conclusions

There is a lesson to be learned from this case study. As we have seen, scientists like to speculate. That is part of their normal work of finding hypotheses that are open to experimental falsification or support by further evidence. When publishing uncertain explanations, scientists must always make clear their limited probability, otherwise it becomes bad science and may be exploited by pseudoscientists. What a grand opportunity our story is for those who need ancient aluminum or thermally toughened glass for their religion of ancient spacecrafts! (So far, I am unaware of such exploitations. Are there any?) Don't forget: when finding a possible explanation for something, your job is not done. See if you can find (or others have found) alternative ones. Then apply Occam's razor! I am convinced that the "just a good story" hypothesis performs best with this test, at least in our case. So, when looking for the true material heart of a legend in reality, don't forget the zero-hypothesis: *there might be none!*

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Crop Circle Mania Wanes

An Investigative Update

JOE NICKELL

In the field among the (remaining) cerealogists, an afternoon adventure.

With England's current crop of grain ("corn," in British parlance), there has sprouted yet another generation of "crop circles"—the swirled-grain phenomenon that for a dozen years had been increasingly imprinted across the southern part of the country and caught the world's attention. "Circlemania" is in decline, however, as I learned on a recent trip to witness the phenomenon first hand.

The giant graffiti began to be noticed about 1980. Notions about their cause ranged from extraterrestrial visitations to wind vortices. However, a study of the features that characterized the phenomenon suggested another answer (Nickell and Fisher 1992). There was an escalation in frequency year after year, a similar increase in complexity (from simple swirled circles in the early period to elaborate pictograms in later years), a noteworthy geographic distribution (the circles' predilection

for southern England), and "the shyness factor" (the phenomenon's avoidance of being observed in action).

These characteristics suggested hoaxing as the cause, and, indeed, in September 1991, two "jovial con men in their sixties"—Doug Bower and Dave Chorley—claimed responsibility for many of the crop patterns produced over the years (Nickell and Fisher 1992).

Last summer in London, where I was a speaker and panelist at the *Fortean Times* magazine's "UnConvention," I met various "cerealogists" and crop-circle authors—notably Jenny Randles and Paul Fuller (see Figure 1)—as well as several hoaxers and swirled-crop artists. Fuller introduced himself and announced cheerfully that he had reversed his former position: he now believed only a very small percentage of the grain designs are genuine, those he thought probably being due to the wind vortices postulated by Terence Meaden (1989). In his convention talk, Fuller provided anecdotal evidence that the "genuine" phenomenon had, sporadically, preceded the era of hoaxed circles. Skeptics in the audience, however, were unconvinced by Fuller's data.

FIGURE 1. Jenny Randles (left) and Paul Fuller, seen here at the *Fortean Times*'s "Unconvention 94," coauthored the book *Crop Circles: A Mystery Solved*. They still claim there are genuine crop circles produced by wind vortices.

To relate briefly some new developments, the incidence of crop circles and pictograms has declined since Doug and Dave (as everyone calls them) confessed their nocturnal activity. Also John Macnish, who as producer of a BBC program and a later bestselling video originally promoted the crop-circle phenomenon, has since written a debunking book, *Cropcircle Apocalypse* (1993), that competes with Jim Schnabel's *Round in Circles* (1993). In addition, some cerealogists have become disillusioned and have given up pursuit of the elusive "genuine" phenomenon. These include Meaden (who, I am told, has turned to his amateur archaeological interests) and Pat Delgado—the "father of cerealogy"—who reportedly "'washed his hands' of the subject" and suspended publication of his newsletter. However, he has supposedly since resumed conducting *research on crop circles* (Fuller 1994a).

Certainly many others continue their interest, which Fuller caters to with his informative periodical *The Crop Watcher*, although he cut back publication from bimonthly to quarterly. Interest among dowsers appears to remain particularly high (more on that in a moment). However, the serious British news media have all but declared a moratorium on the subject. States Fuller (1992b): "Over the past couple of years crop circles have taken a real beating from the skeptics. In my opinion this was long overdue and deserved. Perhaps the lack of attention will drive away the hoaxers."

FIGURE 2. British skeptic Chris Nash examines the swirled-grain pattern in this slightly elevated view of a Wiltshire pictogram.

FIGURE 3. Chris Nash (left) and fellow British skeptic John Eastmond are amused with a farmer's hand-made sign proclaiming the pictogram in the distance to be a "hoax."

Some new information pertaining to old matters has also come to light, including Doug Bower's own photos of crop circles he produced at Cheesefoot Head and at Westbury during the early 1980s (Macnish 1993, plates 15-18). Also Macnish (1993) relates how "believers" at a 1992 CSETI watch for alien visitations were fooled by lighted balloons he says were launched by Schnabel and an associate. He also provides new evidence—previously suppressed by cerealogists—concerning the elaborate Mandelbrot-set pictogram: discovered at the centers of the design's peripheral circles were small but telltale post holes.

More recent information comes from what I can literally call my field research. On Sunday, June 18, following the close of the Fortean conference, I went on an expedition into the vast wheat crops, conducted especially for me by veteran crop-circle investigators Chris Nash and John Eastmond (both of Southhampton University) with an

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FIGURE 4. John Eastmond (left) and author Joe Nickell examine the "hoax" pictogram located opposite the famous man-made mound, Silbury Hill, seen in the background.

assist from the United Kingdom's SKEPTICAL INQUIRER representative, Michael J. Hutchinson (who did not, however, accompany us on the trip). With Chris at the wheel, the three of us motored into the picturesque Wiltshire countryside. We passed through charming thatched-roof villages—including that of Avebury, set amid a great prehistoric circle of standing stones—and came upon a hillside adorned with a giant white horse (one of several ancient effigies formed by exposing the underlying chalk).

By nightfall, we had discovered a handful of circles and pictograms. Two that were reasonably accessible are shown in the accompanying photos. The first was composed of a line of circles—a dozen by my count, or, as Chris waggishly clarified, mocking the exaggerating tone of crop-circle enthusiasts, "exactly a dozen." (Rather than follow the tractor "tramlines" into the figure, we took a shortcut—carefully picking our way through the wheat.)

It is of course easier to see the overall pattern on a slope from a distance rather than from within the pictogram. The skeptics did not have with them their pole-mounted camera, but John bravely climbed atop my shoulders for a better view and a snapshot from my camera (Figure 2). Examining the swirl pattern, Chris thought the figure a rather ordinary example of a relatively simple pictogram.

The second one we examined was more unusual, with a crescent-and-circle design, but it appeared somewhat older, since the wheat was recovering from having been matted. Amusingly, the farmer had placed crude signs at the gate, requesting that visitors please use the footpath so as not to damage the crop and announcing huffily: "The Circle—It's a Hoax" (Figure 3).

Located just opposite the ancient man-made mound, Silbury Hill (Figure 4), the pictogram was nevertheless pronounced genuine by a group of local dowsers who had preceded us to the site. One of them twitched his magical wands for the camera (Figure 5) and explained that the swirled patterns were produced by spirits of the earth. He observed that the figure was on a "ley line" (a supposed path of mystical energy) that ran from nearby West Kennet Long Barrow through Silbury Hill to another ancient site. (Chris and I did our best to keep straight faces while the gentleman measured our invisible "auras." After we had compliantly meditated for a few moments, the witching rods indicated our energy fields had

FIGURE 5. A dowser claims the reaction of his rod proves the pictogram is not a hoax but a genuine formation produced by earth spirits.

expanded from a few inches to several feet. "Wow!" we said.)

Subsequently we made our way to the top of the hill to the nearby ancient barrow, where we encountered a group of young Christian evangelists. As we explored the barrow's tunnel-like passage with its flanking burial niches, overhead the young people sang and rhythmically clapped their hands to "bless" the site and counter any evil forces. Off in the distance was another hillslope adorned with a large pictogram.

After dark we rested over refreshments at an old stone tavern, where cerealogists had once congregated in droves. It was now hosting, among others, a group of jockeys and three skeptics—at least one of whom was tired but delighted with the afternoon's rich and colorful experiences. A train ride back to London, arriving at Paddington Station just past midnight, brought to a close my crop-circle adventure.

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Exposing Psychic Sleuths

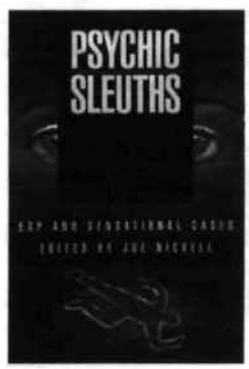
ROBERT BAKER

Psychic Sleuths: ESP and Sensational Cases. Edited by Joe Nickell. Prometheus Books, Amherst, N.Y. 1994. 251 pp. Hardcover, $24.95.

In his approach to the question of psychic detectives—self-proclaimed "psychics" who claim they help solve crimes—Joe Nickell wisely chose to create a "task force" in which a number of experienced, tough-minded investigators were each assigned a well-known psychic sleuth and given a year to examine his or her claims. Then, after their reports were in, the distinguished psychologist and critic of parapsychology James E. Alcock, agreed to evaluate their findings in an afterword. This approach was extraordinarily successful and has produced—if not the final word on the subject—at least a challenge of impressive magnitude. It is difficult to confront Alcock's conclusions:

> The information presented by the authors of the preceding chapters indicates that even the term *sleuth*—let alone the adjective *psychic*—should not be applied to the individuals whom they have discussed, for despite the vaunted claims, careful examination reveals no successful crime solving but instead only tangled webs of misinformation, generalization, opportunistic credit-taking, and, in some instances, probable deceit. Since they have not been found to be successful sleuths, there seems little to be gained by debating whether or not they are psychic sleuths. (p. 173)

The claimants to whom these remarks are applied and their investigators are: "The Man with the Radar Brain: Peter Hurkos," studied by Henry Gordon; "The Mozart of Psychics: Gerard Croiset," investigated by Stephen Peterson; "America's Most Famous Psychic Sleuth: Dorothy Allison," examined by Michael R. Dennett; "The Media's Rising Star Psychic Sleuth: Noreen Renier," reviewed by Gary P. Posner; "Veteran Psychic Detective: Bill Ward," searched out by Jim Lippard; "A Recent Psychic Sleuth: Rosemarie Kerr," ferreted out by Lee Roger Taylor, Jr., and Michael R. Dennett; "The Mythological Psychic Detective: Phil Jordan," clarified by Kenneth L. Feder and Michael Alan Park; "A Product of the Media: Greta Alexander," exposed by Ward Lucas; and "A Psychic Detective Bureau: Some Additional Claimants," listed and cited by editor Nickell.



Extremely useful and informative are five additional appendices evaluating the use of psychics in the investigation of major crimes; an experimental study comparing the skill of psychics, detectives, and students in solving crimes; two studies of the extent to which psychics are actually used by the police (one from the SKEPTICAL INQUIRER, see "Psychics: Do Police Departments Really Use Them?" 17: 148-158), and a fascinating, wry, and ironic survey of some of the psychic sleuths' "outstanding failures."

The investigators' contributions are incisive, thorough, factual, fair, and clearly presented. All are well written and make patent that none of the independent investigators rejected on a-priori grounds the alleged psychic skills and abilities of the claimants. The rejection occurred after the investigations were completed, not before.

In the event that you, too, would like to try your hand at pretending to be a "psychic detective," Alcock has provided a step-by-step, do-it-yourself set of procedures that are sure-fire. No reason why you, too, shouldn't get in on the fun. If you are brave enough to give it a try, just remember there are some gauntlets you will have to run, some pitfalls that must be avoided, and some snares that can bring you down. These are the same ones that proved to be the

undoing of the more famous and infamous psychics that have gone before. You must also beware of the doubters and nonbelievers—and those skeptics who have read this book—will snicker maliciously at your boasts and claims.

Nickell has, however, neatly enumerated these traps for all you players in his Introduction: first, some famous cases of successful crime-solving never actually happened; second, psychics used ordinary means for getting information that they then presented as having been psychically obtained; third, much of a psychic's apparent success is due to the faulty recollection of what he or she actually said; fourth, psychics tend to deal in vague generalities—nothing is ever very specific; fifth, other psychics frequently benefit from after-the-fact interpretations, i.e., retrofitting predictions and outcomes; sixth, and finally, if it weren't for all those other social and psychological factors that cause people to accept the accuracy of dubious information—you'd be dead in the water.

Taken as a whole, *Psychic Sleuths* serves as a timely, definitive, and enlightening rebuttal to the 1991 volume *The Blue Sense* (Mysterious Press, New York) by Arthur Lyons and Marcello Truzzi, who found some sense and substance in the paranormal claims of these psychic pretenders.

If you want to own the one best book on the topic of psychic detectives and their alleged powers, as well as their lack of same, Nickell's volume is the one to get.

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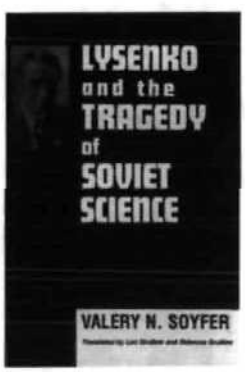
The Lessons of Lysenkoism

GRAYDON JOHN FORRER

Lysenko and the Tragedy of Soviet Science. By Valery N. Soyfer (translated by Leo and Rebecca Gruliow). Rutgers University Press, New Brunswick, N.J., 1994. 379 pp. Hardcover, $35.

Valery Soyfer has written an important book for all skeptics and those who would defend the scientific method and the right to free inquiry. The lesson of Soyfer's *Lysenko and the Tragedy of Soviet Science* is that freedom of thought is a fragile flower that may be easily crushed by charlatans, fakes, and demagogues unafraid of using the power of the state for their own cynical ends. The book is a warning about both the power of the state and the appeal of pseudoscience. More important, the book is a call to action for all who watch with passive disdain the rise of such modern Lysenkoist practices as untested alternative medicine, New Age philosophies, creation science, and the demagoguery of the religious right.

While the story of Lysenko and Lysenkoism is not new, Soyfer's intelligent and authoritative retelling makes for compelling reading. Beginning in the late 1920s, the government of the Soviet Union embraced the biological and agricultural theories of Trofim Lysenko (1898-1976) to the exclusion of traditional biology and genetics. Lysenkoist Biology became the official biology of both party and state and held the Soviet biological community in its thrall for more than 40 years. Those who questioned Lysenko or his cadres were purged from government and academia without mercy. Indeed, the full power of the Stalinist police state was employed by Lysenko and his adherents to terrorize and silence all who challenged Lysenko's pseudoscientific theories. Thousands of biologists, geneticists, and agronomists were dismissed from their jobs, many served time in the Gulag, and some paid for their dissent with their lives. Even today, the biological and genetic sciences in the former Soviet Union suffer as a result of Lysenko's reign of terror.



Soyfer, a professor and director of the Laboratory of Molecular Genetics at George Mason University, knew Lysenko as a young biology student in Moscow during the 1950s. He vividly and expertly details the systematic destruction of Soviet biology and genetics under Stalin. He chronicles how Lysenko, with only a meager education in science and agronomy, rose to dominate the Soviet biological establishment through the use of guile and a keen sense of the political and ideological wind blowing through the Stalinist state.

For Lysenko, scientific ignorance was a positive attribute. He was the "Peasant Scientist," the self-made, self-taught new Soviet man. By his example, the wonders and promise of modern science and technology would be made available to all without any fuss or bother over the niceties of proof or analysis. He championed a new science that could be applied directly to the vast economic and agricultural challenges facing the new Soviet state. He would, he proclaimed, revolutionize agriculture just as Stalin revolutionized the world. He shrilly denounced those who questioned his theory and method as bourgeois enemies of socialism and the new Soviet society, and a credulous and scientifically ignorant political leadership latched on to Lysenko as the

savior of Soviet agriculture. They promoted him, disguised his failures, and silenced his opponents.

Lysenko brazenly declared that modern, Mendelian genetics was bunk and propounded a theory that plants and their unique genetic characteristics could be quickly "trained" to serve Soviet agricultural interests. Lysenko postulated that, through a process called "vernalization," plants could "learn" to grow in any fashion that the Marxist state needed in its effort to revolutionize Soviet agriculture. Where traditional biologists and geneticists argued that many generations and many years were necessary to change basic plant characteristics and develop new varieties, Lysenko asserted that progress could be achieved with the breakneck speed of one or two generations.

Thus, for instance, spring wheat could be transformed in a mere generation into winter varieties. Elm trees could be trained to be hickory trees. Nonliving matter could be transformed into living matter. Lysenko, in short, strove to relegate Mendelian biology and proved agricultural practices to the waste-bin of history as the dying remnant of an immoral capitalist science.

Through all his years of dominating Soviet biology, Lysenko and his cronies never offered any tangible proof for his theories. Peer review was discouraged as a plot by the bourgeoisie to enslave the peasant class. All questioning of method was deemed politically suspect. Academic inquiry and analysis were insults to the great Soviet people and consequently stifled. All progress in genetics, agriculture, and biology achieved in the West was dismissed as a fraud. All independent biology and genetics in the Soviet Union halted unless it had Lysenko's approval.

At the peak of his power, Lysenko controlled the Soviet Academy of Science and served as one of the chairmen of the Supreme Soviet—the titular rulers of the country. He commanded the ear of Stalin and later Khrushchev with impossible promises of the quick and vast expansion of Soviet agriculture that would demonstrate the superiority of Soviet science while burying the West. In the end, the Soviet state ordered the adoption of Lysenko's method on a huge scale. The result was an unprecedented, manmade agricultural disaster causing untold human suffering and environmental damage that continues to plague Russia today.

Lysenko and the Tragedy of Soviet Science provides a rare, firsthand insight into how a terrorist state uses and abuses public trust and ignorance to undermine freedom. It is also a stern warning for those who believe that some form of Lysenkoism could not happen here. Today, we find an American public ever more leery of the promise of science and technology to provide solutions to complex global problems. The public, woefully ill-informed on the means, structure, and method of scientific inquiry, readily embraces philosophies and ideologies that seem to offer easy solutions. Unfortunately, the public's misguided acceptance—for example, of the promises of untested alternative medicines and parapsychology—has made it easy prey for those who, like Lysenko, posit solutions without proof and who argue that Western scientific methods and standards cannot be applied to the intangible universal truth they seek to reveal.

Soyfer's book makes a compelling argument for standing up and engaging in vigorous debate with those who would bedazzle the public with scientific and logical sleight of hand. More important, it underscores the need for the community of skeptics to patiently and without condescension engage the public in a continuing national dialogue about what science is and what it can and cannot do.

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Good-humored Adventure in the Congo

JOHN H. ACORN

Drums Along the Congo: On the Trail of Mokele-Mbembe, the Last Living Dinosaur. By Rory Nugent. Houghton Mifflin, Boston, Mass., 1993. 243 pp. Paper, $10.95.

Unlike claims for the existence of the Loch Ness Monster or the Sasquatch, the idea of a living sauropod dinosaur in the Lake Tele region of the Congo Basin of Africa has never quite captured its share of popular support. The 1985 Disney movie *Baby, Secret of the Lost Legend* brought the "Mokele-Mbembe" to a wide audience, but in my judgment, based on work with educational books, films, and exhibits about dinosaurs, few people took the underlying idea seriously. After all, it's a silly idea.

Cryptozoologists, on the other hand, are often incapable of grasping the extent of their own silliness, and as a casual observer of cryptozoology I get

the impression that the Mokele-Mbembe is now one of their favorite beasts. In his preface to Roy Mackal's book *A Living Dinosaur?* the father of cryptozoology, Bernard Heuvelmans. referred to the Mokele-Mbembe as the "zoological craze of the 1980s." If indeed this was the case, which in retrospect it wasn't, the impact of Mokele-Mbembe was no doubt also fueled by the recent dinosaur craze, which seems to have peaked with Steven Spielberg's *Jurassic Park.*

Popular interest in this subject began with expeditions in 1980 and 1981 led by Chicago's Roy Mackal. Mackal's book, *A Living Dinosaur?* became a cult favorite among my biologist friends. To pass away the time we used to read parts of the book aloud, howling with laughter at the sorry excuses for evidence offered in support of the Mokele-Mbembe hypothesis. We especially enjoyed Mackal's account of a supposed sauropod footprint (invisible in his photograph) that, for reasons that completely escaped us, could not possibly have been made by an elephant. The idea that extraordinary claims require extraordinary proof seems never to have occurred to Mackal, although he more or less admits that he really hasn't established the existence of anything.

Well, the good news is that the footprint is still there, visible for a fee, and that a much better writer than Mackal recently made the trip to see it. Cryptozoologists seem to me to be a harmless bunch, with no particular political or social agenda, and for "fringe-watchers" their adventures and rationalizations make for entertaining fare. So, when I picked up Rory Nugent's *Drums Along the Congo: On the Trail of Mokele-Mbembe, the Last Living Dinosaur,* I expected another yarn about a pseudoscientific crackpot on a hopeless expedition. I was in for a surprise; but before I disclose why, let me quickly summarize what I believe to be the appropriate skeptical response to claims for the existence of monsters.

Every cryptozoological claim comes with at least some evidence. Sightings, photographs, footprints, hair samples, and the like, are used to argue that (1) the animal exists, (2) it will be captured soon, and (3) the zoological orthodoxy is ignoring both (1) and (2). For zoologists, and skeptics in general, two responses are appropriate. First, one can investigate the evidence for oneself and attempt to distinguish fraud and misinterpretation from real empirical corroboration. Second, one can construct alternative hypotheses that are consistent with and explain the evidence, but which have the advantage of greater parsimony by virtue of being less encumbered by poorly supported assumptions. Herein lies the difficulty for untrained or poorly trained observers: judging parsimony requires breadth of both experience and education, and is more than just a matter of following a formula for the "scientific method." For most zoologists, the idea that such things as Mokele-Mbembe exist is far less parsimonious than the suggestion that they are mythical, and in the absence of definitive proof parsimony is not just the best reasoning tool available but the only one as well.

Returning to the matter at hand, this is an enjoyable book. Nugent is a talented, intelligent writer with a sense of humor. Whatever problems he may have with credulity are compensated for by his admirable spirit of adventure. One quickly gets the impression that he really could not have cared less whether he saw a Mokele-Mbembe, which of course he didn't. He gives no indication that he intends to follow up on his quest, and in that sense alone he sets himself apart from just about every cryptozoological writer in print. In fact, he is an adventure/travel writer, not a cryptozoological writer. To illustrate, the first 172 pages of the book tell only of his adventures *on the way* to the rainforest, and in those pages we meet an amusing cast of petty bureaucrats, witch doctors, and the everyday folk of the Congo. By the time Nugent reaches Lake Tele, the reader knows perfectly well that he won't come back with a dinosaur, but by that point it doesn't much matter. This is a book about the Congo, its people, and one of the last remaining tracts of more or less undisturbed rainforest on the African continent. It has but 243 pages, leaving only 71 for his expedition proper.

Of course that doesn't mean Nugent is off the hook. After all, he did set out to prove the existence of a living sauropod, and as skeptics we can't forget that fact, even if he is a nice guy. Nugent's credentials are never disclosed, although he does (p. 124) claim to have been part of a group of journalists. The book is liberally spiced with natural history notes, however, and these allow us to judge his credibility in a general sense. I have not taken the time to check on all his claims, but a number of problematic items popped out at me as I read. For example, the lizard photograph in the insert between pages 152 and 153 clearly corresponds with the text on page 213. In the text, the lizard is described as a "two-foot long reptile. It has a triple-horned snout and stubby tail. . . ." The photo shows neither of these features, but is readily identifiable as a monitor lizard in the genus *Varanus.* These lizards do not have horns on their snouts, and possess long, whiplike tails, not stubby ones. Another obvious gaffe appears on page 183, where he refers to Lord Derby squirrels as "the best flyers among mammals," presumably unaware of the fact that bats, which fly very well, are also mammals. These examples are not alone, and they serve to underscore the need for a pinch of salt when reading the more important passages.

For cryptozoologists, the highlight of the book will be the two photographs that claim to portray Mokele-Mbembe. One is a very distant snapshot of what appears to be a log floating in a lake; the other might as well be a flying, out-of-focus wedding bouquet in transit past a bed sheet. Nugent's

account of his "sighting" is equally vague, and he makes no attempt to disguise this fact. The final photo, however, is the telling one. It is captioned "A diorama sighting of Mokele-Mbembe in Milwaukee. (Dave Robbins, Institute of Comedy)." It shows a carefully lit model of an ornithomimid dinosaur with its head obscured by vegetation. At this point, it is impossible to know whether or not the entire book was written tongue-in-cheek, but as I said earlier, it doesn't much matter.

Another highlight consists of Nugent's account of meeting Marc Rothermel and three other members of a British expedition in search of Mokele-Mbembe. (Oh, please, let them write a book about it!) When asked if they succeeded, Rothermel is said to have responded, "We didn't see one bit of evidence." Nugent then sums up the results of other expeditions before his. Marcellin Agnagna, a Congolese forestry agent, says he saw the beast, took pictures of it, but "forgot to remove the camera's lens cap." Herman and Kia Regusters, from California, had a similar experience, and returned home only to announce that "their film had been ruined." Even Roy Mackal makes it into this chapter, with Nugent recounting the fact that "over the phone he left the impression that he was a full-time university professor, but I found him in the administrative offices associated with the building and grounds department."

What is perhaps Nugent's most important contribution to Mokele-Mbembe lore appears on page 163, although Nugent himself makes no claim that it is significant. Here, he recounts an interview with a witch doctor: "He believes Mokele-Mbembe is a powerful deity that constantly changes appearance, varying by divine whim and human perception. People have come to him with wildly differing descriptions of Mokcle-Mbembe, and he believes them all, sure that no one would risk their own well-being by lying about the gods." The implications are obvious: if Mokele-Mbembe is considered a god, and if local people believe that it can take any shape, then extreme care would be needed on the part of cryptozoological interviewers in order to avoid selectively presenting dinosaur-like sightings, or being led down the garden path by the suggestibility of one's subject. Did the Mokele-Mbembe-hunting cryptozoologists possess these skills? It doesn't seem likely.

I predict that hard-core cryptozoologists will not be happy with this book. Nugent doesn't try hard enough to pretend he's a scientist, and he makes no effort to hide his sense of humor. For cryptozoology, I suspect it will be considered bad press. On the other hand, it is one of the most enjoyable "unknown animal" books I have read, and it exhibits a sort of frankness and lack of pretension that deserves praise. Sure, Nugent is a zany adventurer who does things most of us would never dream of but somehow he seems to keep it all in some kind of perspective, at least between the covers of this book.

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New Books

Camera Clues. Joe Nickell. University Press of Kentucky, Lexington, KY 40508-4008, 1994. 234 pp. $26.95, hardcover. An authoritative work on all aspects of photographic investigation. Topics include how to identify and date old photos, how to distinguish originals from fakes, forensic applications, "surreptitious" photography, and "paranormal" photography: alleged photographs of ghosts, UFOs, and legendary creatures, "miracle" pictures, and pictures supposedly produced by ESP. To be reviewed in our next issue.

DNA in the Courtroom. Howard Coleman and Eric Swenson. GeneLex Corporation, 2203 Airport Way South, Suite 350, Seattle, WA 98134, 1994. 131 pp. $12.95, paper. Written by a DNA expert and a science writer, this is a timely and handy guide to all aspects of the use of DNA in the courtroom. Succinctly outlines the science and technology of DNA testing and legal issues involved in understanding and accepting the validity of scientific evidence. A final chapter, on DNA and the O. J. Simpson case, serves as a primer on the DNA-related issues in that trial.

Fortean Studies. Edited by Steve Moore. John Brown Publishing. Available by mail only from: Fortean Times, Box 754, Manhasset, NY 11030, or 20 Paul Street, Frome, Somerset BA11 IDX, UK, 1994. 350 pp. $44.00 (UK: £19.99), paper. The first in an annual series published by the *Fortean Times,* the journal of strange phenomena. Intended as a repository of contemporary Fortean research from around the world, particularly research articles too long and complex to be included in the magazine itself. Filled with a variety of strange reports, unfortunately often presented with insufficient skepticism.

—Kendrick Frazier

Articles of Note

Abraham, Yvonne. "The Alienation Effect." *Lingua Franca,* 5(1): 9-11, November/December 1994. Scholars who study alleged alien abduction risk damaging their academic careers. "It's difficult . . . to use UFO research for tenure," laments one.

Barry, Dan. "Feinstein's Universe." *Providence Sunday Journal,* November 13, 1994, pp. 1, 24-25. A three-newspaper-page investigation into how Rhode Island direct-mail-sales multimillionaire/philanthropist Alan Shawn Feinstein makes money. Included are reports on his Project Indigo, in which he encouraged participants to direct a synchronized mental message to extraterrestrials; his holographic space-alien cards; and promotion in his widely distributed newsletter about the "Face on Mars" as an alien artifact.

Cohen, Jon. "The Duesberg Phenomenon." *Science,* 266:1642-1649, December 9, 1994. A three-month *Science* investigation into the claims by Berkeley virologist Peter Duesberg that the HIV virus is not the cause of AIDS. The investigation concludes that although Duesberg "raises provocative questions, few researchers find his basic contention that HIV is not the cause of AIDS persuasive. Mainstream AIDS researchers argue that Duesberg's arguments are constructed by selective reading of the scientific literature, dismissing evidence that contradicts his theses, requiring impossibly definitive proof, and dismissing outright studies marked by inconsequential weaknesses." Also finds specifically that in hemophiliacs (Duesberg's best test case) there is abundant evidence that HIV causes disease and death and that HIV now fulfills the classic postulates of disease causation. Also, Duesberg cited the AIDS epidemic in Thailand as confirmation of his theories, but it instead seems to confirm the role of HIV in AIDS. Letters in response appear in *Science,* 267: 157-160, January 13, 1995, and 267: 313-315 January 20, 1995. The latter includes Duesberg's response and Cohen's brief reply.

Curry, Patrick. "Stars in Our Eyes." *New Statesman and Society,* January 6, 1995, pp. 32-33 . Curry discusses the human desire to know the future, which provides a living for both astrologers and financial forecasters.

Eve, Raymond, and Francis B. Harrold. "The Influence of Group Process on Pseudoscientific Belief: 'Knowledge Industries' and the Legitimation of Threatened Worldviews." *Advances in Group Processes,* 10:133-162, 1993. Scholars often attribute pseudoscientific beliefs to such individual factors as ignorance, superstition, and psychopathology. The authors suggest, in contrast, that pseudoscientific belief often originates in normal group processes. They show how common errors in human reasoning are often influenced by emergent norms within one's peer group. They also show that much pseudoscientific belief arises normally out of a struggle among cultural traditionalists, modernists, and postmodernists, and that this is a struggle to promulgate one's cultural views over generations.

Frei, Matt. "Italy's Obsession with the Devil." *The Spectator,* November 12, 1994, pp. 14-16. Each year in Italy an estimated 12 million people seek the help of "magi," healers, and exorcists whose services are advertised in the yellow pages.

Highfield, Roger. "It's All a Load of Twaddle." *Weekly Telegraph* (London), Issue No. 184, January 25-31, 1995, p. 27. Inquiry into why people cling to the pseudoscience of astrology. Reviews the evidence against it and quotes psychologists Susan Blackmore and Adrian Furnham on "the fallacy of personal validation," the way the human mind is made to search for connections, valid or not, and so on. A companion piece, "13th Zodiac Sign May Be Lucky for Some," has Jacqueline Mitton of the Royal Astronomical Society pointing out that the dates governing each astrological sign are wildly inaccurate. In addition, the sun is in each constellation for varying lengths of time and anyone born between November 30 and December 17 is in reality born under a "new" sign, the constellation Ophiuchus. The BBC informed the tabloid newspapers about the new zodiac, "but they would not touch the story as they didn't want to discredit their highly paid astrologers," said a spokesman.

Martin, Michael. "Pseudoscience, the Paranormal, and Science Education." *Science and Education,* 3(4): 357-371, October 1994. Science teachers should not be ignoring pseudoscience and the paranormal, but using them to teach critical-thinking skills. Martin offers lesson suggestions involving ESP, Lysenkoism, the Bermuda Triangle, etc.

Moore, Timothy E. "Subliminal Self-Help Auditory Tapes: An Empirical Test of Perceptual Consequences." *Journal of Behavioral Science,* 27:9-20, 1995. Fifty-three subjects listened to pairs of commercially available subliminal audio tapes that contained ostensibly different subliminal messages but were otherwise identical. Participants were asked to distinguish one tape from the other. After 400 trials, their performance was indistinguishable from chance. The data indicate that the tapes "do not appear to meet the minimum condition necessary for demonstrating subliminal perception, thereby obviating any possible therapeutic consequences."

Nollinger, Mark. "Something Weird Is Coming to a TV Near You." *TV Guide,* October 22, 1994, pp. 16-20. Reports on the latest manifestation of TV's fascination with the supernatural and the paranormal, the rash of "reality-based shows touting unreality."

Scott, Eugenie C. "Science and Christianity Are Compatible—With Some Compromises." *The Scientist,* January 9, 1995, p. 12. The executive director of the National Center for Science Education offers a thoughtful essay. After reviewing the many differences between science and religion, she points out that many scientists are also religious and says acceptance of science does not necessarily require acceptance of philosophical naturalism. She emphasizes that it is not wise for scientists to pose science as an enemy of religion, since in U.S. society more than 90 percent of the people believe in God.

Timpane, John. "How to Convince a Reluctant Scientist." *Scientific American,* January 1995, p. 104. Asks, "What makes a scientific argument persuasive?" Says Timpane: "Conversion happens when a piece falls into place and renders the whole puzzle new. Often the new vision is so powerful that our decision to accept may seem hardly a decision at all. But a decision it is. Precisely because they are not rational, such leaps—from final ice flow to riverbank—are wonderfully, deeply human."

—Kendrick Frazier and Robert Lopresti

Empirical Evidence for Reincarnation?

A Response to Leonard Angel

IAN STEVENSON

If I could be sure that readers of the SKEPTICAL INQUIRER would examine my report of the case of Imad Elawar (Stevenson 1974), I should have no need to reply to Leonard Angel's criticism of my investigation of it (Angel 1994). Readers of my report would quickly learn that Angel's statements show grave omissions of important information that I included in the report as well as inappropriate emphases on certain discrepancies in the testimony and verifications.

If the SKEPTICAL INQUIRER were a scientific journal, its editor would have invited me to prepare a reply that would be published in the same issue as Angel's article. Instead, I only learned about Angel's article from friends who persuaded me to depart from my policy of ignoring criticisms published in magazines. I then sent to the editor a detailed reply, which he has found too long to publish (notwithstanding the considerable length of Angel's article). I am given adequate space to reply to only one of Angel's points, and accordingly I have selected one of his most egregious distortions.

Angel claims that I placed too much reliance on the verifying testimony of Haffez Bouhamzy, Ibrahim Bouhamzy's cousin. I cannot say whether Angel made this statement from ill-considered guile or from carelessness. In either event, it seems risky, because anyone turning to my report could read (on page 283) the following:

> At the end of my stay in Lebanon in March, 1964, the verifications of the statements attributed to Imad Elawar had come largely from only one witness, Mr. Haffez Bouhamzy. . . . I had no reason to doubt Mr. Haffez Bouhamzy's testimony, but believed that I ought to check it against that of other witnesses. I therefore decided to return to Lebanon and did so in August, 1964.

After this passage I give the names of the additional informants I interviewed in August 1964. Angel makes no mention of this second trip to Lebanon made for the express purpose of extending the verifications. He states that Haffez Bouhamzy was a verifier for 28 items, which is true. What he leaves out is that of these items only 5 depended solely on Haffez Bouhamzy for their verification. (In this count I have omitted item 1 of Tabulation One of my report; although I recorded in the tabulation only Haffez Bouhamzy as verifying it, several other informants obviously did so also.) For all the other verifiable and correct items I found one or more other persons who verified them. Imad also made 20 other correct statements for which Haffez was not a verifier. I tabulated 61 statements in the two tabulations of my report (these are apart from Imad's recognitions). Of these, 49 were correct for Ibrahim, 5 unverified, 6 incorrect, and 1 doubtful. Two of the items I list as incorrect were partly correct or doubtful.

Angel would disqualify Haffez Bouhamzy as a reliable informant because he said incorrectly that Ibrahim Bouhamzy had had tuberculosis of the spine. (In my full Reply to Angel I offered a plausible explanation of how Haffez came to misunderstand the organs affected by Ibrahim's tuberculosis, but I do not deny that he was mistaken on this point.) In emphasizing this mistake, however, Angel overlooks the confirmation by other informants of all but one of Haffez's 23 verifications for which there was another verifier. In confirming Haffez's statements Nabih Bouhamzy made a valuable witness, because he had not been present when I had interviewed Haffez. (Haffez was present during my interview with Nabih.) Also, having lived in the United States, he spoke English, which obviated possible errors in translation. I interviewed Ibrahim's brother Fuad without Haffez being present. In a footnote on pages 281-282 of my report of the case I drew attention to the concordance between Fuad's testi-

mony and that of Haffez in matters other than Ibrahim's final illness. Angel does not mention this footnote or the nearly uniform agreement of other informants with Haffez.

Readers wishing to study my full reply to Angel with its correction of his other misrepresentations may obtain a copy by writing to me at the address below; alternatively, they could read my original report of the case of Imad Elawar and learn from doing so how misleading Angel was in other statements in his article.

In conclusion, I would like to mention that, since my investigation of Imad's case, my colleagues and I have studied other cases that presented a similar problem: that of finding a person exactly matching the subject's statements. Interested readers can find examples in reports—by myself and other investigators—of other cases with written records made before verification (Mills, Haraldsson, and Keil 1994; Stevenson 1977; Stevenson and Samararatne 1988; and Haraldsson 1992). Our endeavor in all such cases is not just that of finding a deceased person who matches the child's statements; we want to be as certain as we can that the statements match the life of no one else. I believe that the case of Imad Elawar reaches this standard, and I continue to think it one of the strongest cases I have investigated. Since its investigation, we have found others as good or stronger. It is therefore particularly foolish for Angel to claim that if he could discredit the case of Imad Elawar, his work would be over.

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Leonard Angel Replies

Unfortunately, Ian Stevenson's response only confirms the difficulty he has grasping the content of elementary criticisms. The claim in point 5 of my article was not that we must "disqualify Haffez" for having made an error. The focus was on (*a*) the inadequacies of Stevenson's interviewing procedures, (*b*) the inadequacies of his reporting on his interviewing procedures, and (*c*) the consequent unreliability of verifications asserted. That is, there are grounds to severely doubt that what Stevenson counted as having been verified had indeed been properly verified. This was clearly stated, and it is surprising that Stevenson has missed the point.

To the charge that he seems to have been unaware of proper interviewing methods, Stevenson can't respond, "Yes, but look how much interviewing I did!" which is the content of his letter.

After all these years Stevenson still seems ignorant of the issues. He doesn't seem to understand the relevance of checking to make sure that a verifier is not aware of what a previous informant has said. Why else would Stevenson not say whether open or closed questions were put to Fuad and Nabih, and whether his interviewing methods allowed them to infer what Haffez's testimony had been? Stevenson's lack of discussion of these matters then and now shows his unawareness, or worse, of crucial issues concerning interviewing methods.

Finally, I too would encourage readers to send for Stevenson's full reply. In it, for the first time, he admits unambiguously that when he first went to Khriby (i.e., after supposedly having settled any uneasiness he had over the accuracy of his notes of the boy's claims), Stevenson recorded that the boy was claiming to have been Mahmoud, married to Jamileh, who died as a result of a truck accident after a quarrel with the driver. Yet Stevenson allowed the claims to be so radically reinterpreted during and subsequent to the verification visits that the person found wasn't Mahmoud, had never married, and died of tuberculosis. Stevenson had the child available to him when he was establishing the claims. Why in the world didn't Stevenson ensure, prior to verification, that the child clarified the basic facts concerning who he thought he had been? That Stevenson still doesn't recognize the devastating impact this has on his case (and continues to regard it as one of his strongest) shows the poverty of his standards.

My *Enlightenment East and West* (SUNY Press, 1994, pp. 280-291) presents my analysis of the Imad Elawar case in fuller detail than the *SI* article. Also, I'd be happy to correspond on these matters.

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Postmodernism and New Age Unreason

GEORGE ENGLEBRETSEN

In Book Gamma of the *Metaphysics,* Aristotle considers the possibility that one might deny the universal logical constraints on rational discourse. In particular, he is concerned with those who might deny the law of noncontradiction ("A statement and its negation cannot both be true at the same time"). His conclusion is that such a speaker could not be counted on to say what he or she means (or mean what is said). And his advice to us is not to attempt conversation with such people.

Postmodern thinkers claim to have broken the fetters of logic (*inter alia*) that have characterized the modern notion of rational discourse. The result, it is claimed, is a new freedom of communication. Rationality, in the sense of allegiance to universal logical constraints, is no longer the only, or even major, "communicative virtue." Social, psychological, political, historical considerations must all take precedence over logic. Judging the rational success of a piece of discourse (or "text") is now a matter to be dealt with by social scientists and literary critics rather than by logicians (the ones in whom moderns and premoderns had invested the task of defining rationality). Freed from the confines of logic, discourse can now become open, honest, sincere, politically sensitive, historically conditioned. Premoderns and moderns based their willingness to accept or reject a speaker's claim on their judgment of how well it seemed to fit the facts of the case and to what extent it was logically consistent with the speaker's other claims or assumptions. By contrast, postmoderns "play the believing game," accepting the speaker's claim according to the degree of sincerity the speaker exhibits. Truth and coherence are no longer allowed to bully us in our communicative efforts. Expertise and authority are no longer the possession of only an elite few. We all share expertise and authority equally. Communication, finally, is democratic. The premodern and modern informed and rational despots have been overthrown. We are *all* informed; we are *all* rational.

As a consequence of this newfound communicative democracy, none of us is in a privileged position relative to another when it comes to imparting knowledge and understanding. Anyone can teach anything to anyone else. Thus, no sin is greater in these postmodern times than the sin of "sub-dialogic discourse," i.e., monologue (lecturing, instructing, etc.) or null discourse (silence, closing conversation). As that guru of American postmodernism, Richard Rorty, has said, our only task is to "keep the conversation going." Aristotle's refusal even to converse with those who would reject the constraints of logic might well be considered now as Adam's Fall with respect to the "ethics of conversation."

So there is no truth. Or, to be fair, there is no Truth.

There are lots of little truths, all of which are relative to the social, psychological, historical, political, etc., contexts of their utterances. Consequently, there can be no disagreement. A says "X" while B says "Not X." But by postmodern lights they do not contradict one another. (Indeed, today Whitman could not even contradict himself!) A says what she says as a woman, or as an oriental, or as an unemployed person, or as a mother, and so on and so on. B says what he says as a male, or as an Hispanic, or as an artist, and so on and so on. One man's (or woman's) "X" is another's "Not X," depending on who (= where, when, what gender, race, age, etc.) they are.

A new age of communicative democracy has now dawned, so the cant goes. And this new age has helped foster the New Age. Now there is a strong temptation to simply ignore nonsense, unreason, irrationality. The rationalist often, and understandably, wants to say that those who live in ignorance deserve the consequences. But the simple fact is that all of us suffer the consequences of willful stupidi-

ty. When reason is under attack, as it certainly is today, there are many victims. In particular, science and education are compromised, contorted, denigrated, denied. And when the war against reason is backed by a large cadre of articulate sophists (e.g., the postmodern philosophers and literary critics) the results are even more insidious. Postmoderns conjure a vision of science, viewed as "no more than the handmaiden of technology," according to Rorty, which is virtually evil itself. Science, from this point of view, is to blame for most of today's economic, environmental, and medical ills. Antiscience, pseudoscience, and literature constitute a new trivium. The latter is the "presiding discipline" of postmodern culture. Education, at all levels, is seen as contributing to the advance of this evil science. Moreover, the whole idea of education as it has been practiced since the Enlightenment is rejected on moral grounds. There can be no separation of teacher (master) and student (slave) when there are no universal standards of truth.

Postmoderns are fond of their universal tolerance of all ideas. After all, by postmodern lights all ideas are equal (i.e., equally true). My idea that the reason Clinton is having political troubles is because he committed a series of hurtful acts during one of his previous lives and your idea that his troubles are due to a complex array of personal and political factors are on a par with each other. Each deserves the same consideration. Each is to be tolerated. The irony here is that this universal tolerance for ideas (reasonable and unreasonable alike) is coupled with a disturbing intolerance for people. The philosophy that sees only "local" truths rather than universal truths not only repudiates science (the attempt to know the truth), but divides people according to their locality, according to who, where, when, what color, gender, etc., they are. The natural result of such division is an intolerance that, in the long run at least, tends to manifest itself in racism, nationalism, sexism, and the like. When my truth and your truth are different depending on the differences between us, then the differences between us cannot be ignored—they matter too much.

If a new Dark Age is about to descend upon us, as many believe, it will be the result of a variety of factors (just as with the last Dark Age). But surely one important factor will be the kind of thinking advocated by postmoderns and New Agers, the kind of thinking that scorns and abjures reason. If we are to keep away the darkness of ignorance and intolerance, philosophers, scientists, and educators who honor the universal benefits of modern science, liberal education, and rational discourse must cast light on today's advocates of nonsense wherever they are found. For, as Goethe said, humans fear reason, but they ought to fear stupidity—for reason can be hard, but stupidity can be fatal. □

James Becker

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Guru *from page 11*

divine their secret mantra by ESP!

In 1994 the cost of a basic TM course jumped from $400 to $1,000. Officials insist that for decades the price has been too low to meet expenses. Besides, they argue, the new price will winnow out dabblers.

Does mantra meditation relieve stress more effectively than praying or just sitting quietly with closed eyes? In 1976, a study of this was made at the University of Michigan and reported in *Science News* (June 19). A group of trained TMers were compared with a control group of subjects unfamiliar with TM. The TM group meditated for a half-hour while the control group merely closed their eyes and relaxed. Blood samples were taken and measurements made of chemicals indicating stress. The researchers concluded that TM meditation failed to induce a metabolic state distinguishable from one achieved by just sitting quietly and possibly dozing.

Similar studies have shown that focusing on a Hindu mantra is no more effective in calming the mind than focusing on any other word, such as *peace, one,* or *banana.* Psychologist David Holmes, at the University of Kansas, could find no physiological difference between meditation and relaxing for 20 minutes in a reclining chair.

For a while, Henning threatened to take Veda Land away from Niagara Falls unless the city fathers refused to allow a gambling casino to open in town. Gambling, said Doug, always brings a plague of hookers. When the city refused to bar gambling, Doug changed his mind. After all, could not Veda Land's Vedic flyers counter the evils of betting and prostitution by their sidhi powers? "Darkness," declared Doug, "cannot show itself in the face of light."

Will Veda Land and its floating building ever get off the ground? It's possible, but my crystal ball tells me it is no more than a fantasy in Doug Henning's field of consciousness. □

Tales *from page 13*

remote-controlled camera in Dianne's residence to capture the frequent kidnappings on tape? Apparently not.

STOP. FAST FORWARD. PLAY.

It's the day after Christmas and Sally Jessy Raphael's topic is mystical visionaries. She's brought in Michael H. Brown, journalist and author of *The Final Hour,* to help her "investigate" various reports of people seeing God, Jesus, and the Virgin Mary.

Brown, asked about the authenticity of such apparitions, sounds as if he's reading from the same playbook as John Mack when he declares, "I have no doubt because of the consistency and detail" from place to place and from person to person.

Raphael shows a videotape of a young diabetic boy telling his father that he has just seen the Virgin Mary at Medjugorje, in the former Yugoslavia. But the words on the tape are so muddled, the producers superimpose the child's reputed words on the screen. If the child did see Mary, it didn't cure his diabetes. His mother claims the need for insulin dropped for about a week, but in the end the youngster has not been healed.

Among Raphael's other guests are "Estela," who says that the Virgin Mary visits her monthly. Estela reveals that Mary looks exactly like the photograph she had been looking at just before the apparition appeared, an odd coincidence Raphael never questions.

Then there's "Jim," who has repeatedly spoken to God and Jesus. Raphael doesn't think to ask why these divine beings don't offer the specific dates, times, and locations of devastating earthquakes or other unpredictable natural phenomena so skeptics can believe.

Raphael introduces a man whose rosary beads supposedly turned to gold after a visit to Medjugorje. Has Raphael or her staff had the rosary analyzed to check if gold is really there? Apparently not. Have Raphael or her staff done their homework and discovered that people often rub off the silver plating to reveal copper or brass beneath, or that tarnishing caused by repeated rubbing can give silver a golden hue? If they have, Raphael's not telling her viewers.

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Letters to the Editor

We received an unusually large number of letters in response to our January/February 1995 issue—the first in our new, enlarged format. As a result, we've had to be more selective than usual in choosing which to publish. We appreciate this response. We read all letters with interest and share many of them with authors and others involved in the editorial process.—EDITOR

Science and wonder

When I listened to Carl Sagan's keynote address during the CSICOP conference in Seattle—the first time I ever saw him in public—I missed his point. Now, with his article "Science and Wonder" (*SI*, January/February 1995), based on the address, I get it.

If Sagan had remained a New York street boy without ever asking his local librarian for "a book on stars," he may have been swept away emotionally by a (hypothetical) medium who promised to put him in touch with his parents after their deaths. "Would you think less of me if I fell for it?" Sagan asks us. "People are not stupid," he remarked twice.

No, we are not. In the 1970s I quit my parents' church; in the 1980s I gave up a New Age cult; and in the 1990s, thanks in part to the skeptical movement and its literature, I lost interest in parapsychology, of which I was an ardent believer for a long time. The point is that my IQ hasn't improved a single digit in the past few years. I wasn't more stupid then than now. Well, if I can have a compassionate retrospective look at myself, why not extend this understanding and compassion to the ab[illegible]es, the channelers, and all other people who believe in all such doctrines, as Sagan advises us in his ending paragraph?

Born-again skeptics like me know all too well that there is indeed a bridge between "Us" and "Them," a bridge that may save skeptics from permanent minority status in the future.

César Tort
Mexico City, Mexico

For a shnook like me to criticize Sagan is the height of chutzpah. However, I must complain about his reference to *recovered memories* (pp. 28-29).

He refers to a *maddening* tendency of skeptics to forget that real and appalling abuse happens, and he tells of a 13-state survey that finds one-sixth of all rape victims under age 12, and that one-half of this number were raped by their fathers.

I am a volunteer at the False Memory Syndrome Foundation office in Philadelphia. I've yet to meet anybody who doesn't realize that child abuse is a reality. It's *recalled memory* that's the problem. How many of these under age 12 forgot their experiences? I would suggest that it is infinitesimal. Oprah Winfrey was a sexually abused child, and she never forgot the experience, and she didn't need a psychiatrist to remind her.

At the FMSF office, I see the pain, so much pain, of accused parents. I've also seen the pain of the recanters. I have heard so many stories of pain on both sides. . . .

Ted Klugman
Lansdale, Pa.

Literary science blunders

I very much enjoyed reading Martin Gardner's "Literary Science Blunders" (*SI*, January/February 1995). I marveled at how astute Gardner was at detecting "howlers" in literature, errors that I might not always have detected on cursory reading.

One error I did catch appeared in Ernst Jünger's famous novel *Heliopolis*. Jünger's hero travels to the moon and describes in poetic terms how the landscape colors itself in successive shades of yellow, then orange, then red as the sun sets over the moon's horizon. In reality, of course, the moon's mountains, craters, and plains must remain colorless due to the absence of any atmosphere on the moon.

I was about 17 when one of my uncles, a poet who wanted to educate me in the literary masterpieces of the world, recommended that I read *Heliopolis*. In fact, so impressed was he by this work that he proclaimed "the world is divided into two classes of people: those who have read *Heliopolis*, and those who have not." Well, read the book I did, then pointed out the error to my uncle, who angrily chided me for calling attention to such trivial matters that in no way detract from the beauty of this work of genius. We had quite an argument about this, which I think I lost.

Didier de Fontaine
Professor of Materials Science
University of California
Berkeley, Calif.

Permit me to add to Martin Gardner's delightful list of "Literary Science Blunders."

Nikos Kazantzakis, in his controversial novel *The Last Temptation of Christ*, constructed a scene where the disciples of Jesus are fearfully discussing the potential ramifications of the recent beheading of John the Baptist by King Herod. Jacob

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FALL 1994 (vol. 18, no. 5): Empirical evidence for reincarnation? / Reader's guide to the ozone controversy / Bigfoot evidence: Are these tracks real? / Why we are unmoved as oceans ebb and flow / Anomalous phenomena in Kazakhstan / False memories.

SUMMER 1994 (vol 18, no 4.): 'Extraordinary science' and the strange legacy of Nikola Tesla / Nikola Tesla: Genius, visionary, and eccentric / Pollens on the 'Shroud': A study in deception / Do televised depictions of paranormal events influence viewers' beliefs? / Synchronicity and the archetypes / The synthetic mind clashes with the reductionist text / Psi in pyschology.

SPRING 1994 (vol. 18, no. 3): The Antiscience Threat: The growth of antiscience / The antiscience problem / Measuring the prevalence of false memories / Bleuler's views on inheritance of acquired characteristics and on psi phenomena / Examining the satanic panic: . . . A personal perspective . . . A sociological and historical perspective / Philosophy and the paranormal, Part 2: Skepticism, miracles, and knowledge.

WINTER 1994 (vol. 18, no. 2) The new skepticism / Philosophy and the paranormal, Part 1: The problem of 'psi.' / Electromagnetic field cancer scares / Attacks on role-playing games / Global fortune-telling and Bible prophecy / Chernikov pattern puzzle.

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FALL 1992 (vol 17, no 1): A celebration of Isaac Asimov: A man for the universe, *Kendrick Frazier, Arthur C. Clarke. Frederik Pohl, Harlan Ellison, L. Sprague de Camp, Carl Sagan, Stephen Jay Gould, Martin Gardner, Paul Kurtz, Donald Goldsmith, James Randi, and E. C. Krupp* / Gaia without mysticism / Gaia's scientific coming of age / The curse of the runestone: Deathless hoaxes / Night terrors, sleep paralysis, and devil-stricken telephone cords from hell / Scientific creationism: The social agenda of a pseudoscience / Observing stars in the daytime: The chimney myth / Does an ancient Jewish amulet commemorate the conjunction of 2 B.C.?

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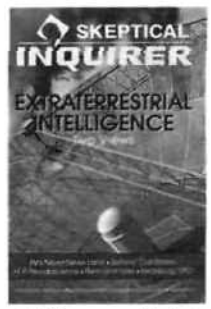

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In addition to being visually stunning (pleasant although unnecessary), the first issue of the "new" SKEPTICAL INQUIRER gives us a virtual cornucopia of marvelous writers and clear thinkers; this is an issue worth keeping, as, in fact, have been most of its predecessors.

—Edwin Van Woert
Oro Valley, Ariz.

Congratulations on your new format.

—Daniel H. Bigelow
Cathlamet, Wash.

Congratulations on the new-style *SI*. Very nice.

—Toby Howard
Editor, *The Skeptic* (U.K.)
Manchester, England

Compliments to you and to the staffs of both *CSICOP* and the SKEPTICAL INQUIRER for the expanded and revised format of the magazine. It looks very professional but yet very readable, and I am sure it will enhance readership.

—Mark W. Durm
Athens, Ala.

When the changes in the SKEPTICAL INQUIRER were announced I was skeptical, but after seeing this first issue in the new format I think you have done an excellent job. I enjoy the magazine very much and look forward to each new issue.

—David Barnes
San Diego, Calif.

Your magazine is simply awesome. At last, a home. I'm only saddened that I didn't know about it before (what wonderful things I must have missed!).

—Michael Bendzela
Standish, Maine

Your most recent issue of *SI* was out of this world!!! I was already in *SI* heaven with the receipt of four back issues, but the brand new issue with the great new style, enlarged content, and stellar articles was a religious experience that held me completely spellbound. . . . Really beautiful job!

—H. V. Grey
Nakomis Fla.

Congratulations on your new format. As a long-term subscriber, I was surprised and pleased to see the magazine in my corner grocery store. Best of luck turning it into a mass-circulation magazine.

—Howard Coleman, President
GeneLex
Seattle, Wash.

Congratulations on the new format. I'd like to help the skeptics' image become less stuffy and more accessible, particularly to youth. Your new format is a giant step in the right direction, as is the catchy subtitle. Keep up the good work.

—Bryan Nichols
Lantzville, B.C.
Canada

The new format of the SKEPTICAL INQUIRER is a welcome improvement to a fine magazine. Thank you.

—Milton Danon
Tarrytown, N.Y.

Congratulations on the new format for the magazine. The changes you've made should make it more visually appealing on the shelves of libraries and bookstores. Catching the eye is certainly one way to entice potential readers to explore between the covers, thereby encountering articles and ideas they might otherwise miss. I was particularly struck with the artwork of Leonard Parkin.

—William L. Gauntt
Manutua, N.J.

I am thoroughly enjoying my new subscription to *SI*, which I only discovered last summer. And congratulations are in order for the all-new-bigger-better format. Truly a job well done!

—William T. Hartwell
Desert Research Institute
Las Vegas, Nev.

speaks to his compatriots: "Wait a minute, lads," he said, "don't explode like gunpowder." Of course gunpowder would not be known in the Middle East for another 1,300 years. . . !

Robert R. Weilacher
Palestine, Texas

I was delighted with the premise of Martin Gardner's "Literary Science Blunders." However, I became disappointed, as he seemed to defeat his premise by showing ignorance of literary conventions and of the processes by which books and films reach the public.

While I'm sure it is true that artists and authors are as ignorant about science as the general public, it would have been nice if Gardner had chosen more convincing examples of blunders; this would have shown how such "howlers" detract from otherwise noteworthy works, therefore justifying the posit that artists should be better informed than the general public, as I think they should

Gardner seems not to know a true conceptual error on the part of the author (the eyeglass scene in *Lord of the Flies*) from an editor's omission. Fitzgerald knew damn well what he was describing, and so does anyone who reads the passage, but his editor should have noticed that he used the wrong word to describe the visible part of the eye, and corrected the manuscript.

Authors may describe things counter to nature for a variety of reasons. In *The Mill on the Floss*, the log that overtakes Maggie Tulliver's boat is a metaphor for the way life has overtaken her; it is a literary device. Yes, physically it should not have happened; that's the whole point. Cather, in turn, describes the *appearance* of the man's eye, not the scientific reality

of his condition. Often a severe cataract is visible through the pupil and does appear to grow over the eye. Krock is destined to have drink destroy him, so Dickens decides to use high drama to make a point. Krock is an alcohol-soaked raisin (a Victorian dessert, served flaming) lit by the hand of an exasperated God. . . .

I sincerely hope Gardner has more examples of literary blunders—ones that can stand scrutiny, because it is certainly true that art suffers when artists are ignorant. Would a gifted wordsmith with a small scope have been more prolific and insightful if better informed? Probably. Gardner is the first person that I know of to take a "hard science" tack with this subject, but social scientists have been picking at historical and cultural inaccuracies in literature for generations. I hope they all will continue.

Rebekah Hammer
Bloomington, Ind.

In "Literary Science Blunders," no effort appears to have been made to distinguish mistakes that might be worthy of such characterization from misstatements of scientific truths that more properly should be characterized as literary/poetic license. If an author perceives a need for an occurrence that requires some departure from "truth," it would seem to fall within the millennia-old tradition of deus ex machina. If, quite properly, an "exception" is recognized for science fiction, why are "mainstream" authors not to be afforded the same luxury? Indeed, is Gardner also guilty of a "blunder" when he states that on a trip to the moon the ship "would be in free-fall all the way to the moon." What ever happened to the need to achieve and maintain escape velocity from the earth? Is that an oversimplification, a blunder, or to be overlooked? (Or am I wrong in believing that that is a scientific fact that comes into play on any attempt to leave the earth's gravitational pull, before one can achieve free-fall to the moon?)

Kenneth B. Povodator
Fairfield, Conn.

Gardner's "Literary Science Blunders" serves only to ridicule artists, particularly literary artists, for not being scientists. He mocks writers for not knowing what we know. Such derision requires the assumptions that it is better to know what we know than what they know and that we are superior to them for knowing it. The polite term for Gardner's attitude is "arrogant." The precise term is "bigoted."

Ironically, Carl Sagan's "Wonder and Skepticism" in the same issue warns us that "the least effective way for skeptics to get the attention of . . . people is to belittle or condescend, or show arrogance."

Sagan again: "The chief deficiency I see in the skeptical movement is polarization: Us vs. Them—the sense that we have a monopoly on the truth; that those other people . . . are morons; that if you're sensible, you'll listen to us."

Russell King
Madison, Wisc.

Gardner's essay on writers ignorant of scientific fact was amusing; but perhaps he might also collect lists of science writers who make glaring literary blunders. An off-the-cuff example: a recent overview of dinosaur paleontology (*Kings of Creation*, Lessem, 1992) illustrates the geological time-scale by quoting Mark Twain—that human life on this planet is like the paint atop the Empire State Building. Twain died in 1910, long before the Empire State Building existed. This is a minor error of fact comparable to F. Scott Fitzgerald's using "retinas" for pupils.

Unlike Gardner, I am skeptical as to whether scientists are any more knowledgeable about the arts and humanities than painters and poets and musicians are knowledgeable about science. In regard to major errors of understanding, for every blockheaded artist ignorant of the orbits of the moon there are also blockheaded scientists ignorant of their own lunatic fringe. An off-the-cuff example: the "great" biologist Haeckel, who in *Riddle of the Universe* and other popular works recorded dangerous distortions of history, philosophy, and religion, as well as bad science. Fortunately, different human beings have different talents that add checks and balances to the hubris of any expertise. Ultimately, we are all amateurs at living; and while Einstein did play classical music, the joke was that he couldn't keep "time."

James Alan Brown
Willoughby, Ohio

If Gardner wants to ferret out literary science blunders, he should get his literature correct first. In no place in Nikolai Gogol's *Dead Souls* does any character physically "spontaneously combust." Gogol does make references, in his last chapter, to the protagonist Chichikov symbolically being consumed by fire in an expensive suit of "smoke and flame." Later, Chichikov "was shaken to the core of his being and melted too. . . . The strongest of men also yield in the furnace of misfortune. . . ." (*Dead Souls*, the Reavey translation, Part 2, Chapter 5). This is, again, only a symbolic reference. Chichikov, in the last mention Gogol makes of him, is still alive, hardly a pile of cinders. Writers certainly make science *blunders, but the converse, scientists* making "literature blunders," is equally amusing.

Walter W. Reisner
Durham, N.C.

Gardner writes: "Thomas Cook, in his crime novel *Flesh and Blood* (1989), has on page 44 an autopsy report saying: 'At the moment of her death, her heart had weighed 4 grams, her brain seven.' He must have meant kilograms."

The average human brain is about 3 pounds, or 1.3 kilograms. Unless the brain had swelled up and cracked open the skull, it's unlikely the brain was 7 kilograms.

Mark Gilkey
Palo Alto, Calif.

It is perhaps unfortunate that Gardner's notes on literary science blunders was in the same issue with C. Eugene Emery, Jr.'s Media Watch column, because this contained a blunder almost as delicious as the ones that Gardner commented on. Specifically, Emery noted that people were not masked against alien viruses or bacteria in the Roswell TV movie. Infectious

agents, at least on our planet, tend to be highly species specific. Infection across species boundaries are unusual. Transmission by species with completely different evolutionary histories is almost inconceivable and certainly far less likely than that a forester would contract dutch elm disease. Emery may have also missed the most entertaining biologic error in the Roswell incident, the assumption that an intelligent, tool-using being would have to be patterned after mankind, obviously the highest point on the evolutionary tree. My parrot, Ralph, suggests that this is the height of speciesism and extraordinarily unlikely from an evolutionary standpoint.

Mark Hauswald, M.D.
Associate Professor
Dept. of Emergency Medicine
School of Medicine
University of New Mexico
Albuquerque, N.M.

Linus Pauling's legacy

Stephen Barrett's article "The Dark Side of Linus Pauling's Legacy" (*SI*, January/February 1995) is plagued by bias and misrepresentation.

Contrary to Barrett's assertions, large amounts of vitamin C significantly decrease the symptoms and duration of colds (clinical studies reviewed by Hemila in *Scandinavian Journal of Infectious Diseases* [1994]).

Barrett criticizes the Linus Pauling Institute, whose Board of Associates includes 22 Nobel laureates, for accepting contributions from Hoffmann-LaRoche. As a nonprofit research organization, the Institute welcomes contributions from most sources, including corporations. Corporate support is heavily relied upon by academic institutions, but has provided only a small fraction of the Institute's revenue, which comes mainly from individuals. Any insinuation that the Institute's research has been biased because of corporate sponsorship is unwarranted and insulting.

Barrett attacks Pauling as "less than honest" and implies that Robinson was fired because results of a mouse skin cancer experiment did not conform to Pauling's thesis. Robinson and Pauling disagreed about administrative and other research matters that Barrett did not address. The negative results observed among mice given the smallest amount of supplemental vitamin C are not transferable to humans, who, unlike mice, do not synthesize the vitamin. As postulated by Pauling and later confirmed by Tsao et al. (*Journal of Nutrition* [1987] and *Life Sciences* [1989]), giving small amounts of vitamin C to mice affected the biosynthesis or metabolism of the vitamin, thereby decreasing its amount in various tissues and organs and increasing the risk of developing skin cancer. High levels of vitamin C had a strong protective effect; they were not "nearly lethal."

Barrett suggests that people have been damaged by following Pauling's advice, but he offers no evidence. The safety (especially compared with OTC drugs) and preventive value of vitamin C have been demonstrated in many studies (*Beyond Deficiency: New Views on the Function and Health Effects of Vitamins* [1992] and *Natural Antioxidants in Human Health and Disease* [1994]. In *Third Conference on Vitamin C* [1987], Rivers states: ". . . The practice of ingesting large quantities of ascorbic acid [vitamin C] will not result in calcium-oxalate stones, increased uric acid excretion, impaired vitamin B_{12} status, iron overload, systemic conditioning, or increased mutagenic activity in healthy individuals." The *Journal of the National Cancer Institute* (1991) reported that vitamin C exhibited significant protection against cancer in 33 of 46 epidemiological studies. *Epidemiology* (1992) reported a 27 percent decrease in mortality in a group of 11,348 people followed for about ten years who consumed vitamin C supplements. The *New England Journal of Medicine* (1993) concluded that the risk for heart disease may be significantly reduced by a high intake of vitamin E. Pauling's valid criticisms of the Mayo Clinic studies have been effectively discussed by Richards in *Vitamin C and Cancer: Medicine or Politics?* (1991). Barrett's claim that "no responsible medical or nutrition scientists" share Pauling's views is simply wrong.

One expects articles in SKEPTICAL INQUIRER to be characterized by rational arguments based on relevant data; Barrett's article does not meet this criterion.

Stephen Lawson
Chief Executive Officer
Linus Pauling Institute of
Science and Medicine
Palo Alto, Calif.

Stephen Barrett replies:

I did not criticize the Pauling Institute for accepting money from Hoffmann-LaRoche or "insinuate that the institute's research was biased because of corporate sponsorship." All I said was that Hoffmann-LaRoche, which produces most of the world's vitamin C, is the institute's largest corporate donor. I assume that Roche felt that supporting the work of Vitamin C's most prominent booster was a good investment.

I did not "imply" that Robinson was fired because the results of an experiment did not conform to Pauling's thesis. I stated that Robinson told a reporter he was fired after his research led him to conclude that vitamin C might promote some types of cancer. After Pauling publicly attacked Robinson's research as "amateurish and incompetent," Robinson sued for libel and collected $575,000 in an out-of-court settlement. I have read the depositions in the case and believe that Robinson was telling the truth.

During the 25 years I have tracked Pauling's activities, most of his megavitamin claims have been unsubstantiated and not shared by responsible nutrition scientists. The epidemiological studies cited by Stephen Lawson have found certain correlations between the levels of intake of antioxidant vitamins (in food as well as in pills) and the incidence of a few aliments. Clinical studies, however, have found that high doses of antioxidants may increase the incidence of cancer and homorrhagic stroke. Further research is needed to determine whether taking antioxidants is more likely to be helpful, harmful, or neither. Regardless, the existing data are complicated and conflicting and do not support Pauling's sweeping pronouncements.

I have seen patients with diarrhea due to vitamin C, including one who had about ten loose bowel movements a day for several years while taking 3-5 grams per day. When I informed Pauling of this case, he replied: "Looseness of the bowels occurs, especially in well people, following an intake of a large quantity of vitamin C. There is question as to whether it should be called diarrhea, however, which is defined as a morbidly profuse discharge of loose or fluid evacuations from the intestinal tract."

Additional information about the activities of Pauling and his allies can be obtained from my recently published book, The Vitamin Pushers: How the "Health-

Food" Industry Is Selling America a Bill of Goods *(Prometheus Books, 1994).*

Barrett's "The Dark Side of Linus Pauling's Legacy" provided some useful information of which I was not previously aware. However, he made several comments for which I find no factual basis.

Barrett writes that "6,000 to 18,000 mg of vitamin C, 400 to 1,600 IU of vitamin E, and 25,000 IU of vitamin A" have "no proved benefit and can cause troublesome side effects." In fact, no serious toxicity has ever been shown for vitamin C, E, or the beta carotene precursor of vitamin A. Caffeine and aspirin are examples of two over-the-counter drugs that are far more toxic than any of these vitamins. As for effectiveness, Barrett would have served his readers better to have discussed some of the studies (unaffiliated with Pauling) that have found benefits for vitamin E and beta carotene.

Barrett writes, "The physical damage to people [Pauling] led astray cannot be measured." If Barrett has any evidence that the dosages recommended by Pauling cause "physical damage," he should have mentioned it in his article.

William Kreuter
Seattle, Wash.

Barrett's article about Linus Pauling was a disturbing eye-opener. I am a chemist who tries to keep current, and I was well aware of the long-standing controversy over vitamin C megatherapy. However, vitamin C's effect on my own life has been so dramatic and clear-cut that I always assumed the studies that failed to support Pauling's premise to be flawed, as he claimed.

During my long college and graduate-school years, I had so many bad colds that I was hospitalized with viral pneumonia 11 times. After a friend introduced me to Pauling and vitamin C, and I began taking 1,000 mg a day, I never had a bad cold again and was never again diagnosed with viral pneumonia. That was 25 years ago, and both the regimen and the results continue. I swear by vitamin C megatherapy, at least for myself, and Barrett's article has not changed my mind.

In recent years I have seen a great many articles documenting the benefits of several vitamins at levels far exceeding the MDR. Barrett's statement that "no responsible medical or nutrition scientists share these views" is simply incorrect and displays his own bias. Of course I acknowledge that my personal anecdote is useless as a proof, but I cannot ignore or discount it. I just wish to suggest that the matter may be more complex than Barrett's simplistic go/no-go approach would indicate.

William H. Beauman
Chicago, Ill.

Stephen Barrett replies:

Vitamin C megadoses can cause diarrhea. High doses of vitamin E can have anticoagulant action and cause unwanted bleeding. Daily dosage of 25,000 IU of vitamin A can cause liver damage. Pauling's unsubstantiated ideas about vitamins as therapeutic agents stretched far beyond what the studies cited by Kreuter suggest (and by no means prove).

Colds are caused by a large family of viruses. Each episode provides immunity to the virus that caused it. The incidence of colds is also influenced by how many infected persons one is exposed to. Most people tend to have fewer colds as they get older. Beauman's "anecdote" illustrates how people tend to value personal experience more than scientific evidence.

Charles Marshall's Vitamins and Minerals: Help or Harm? *(Lippincott, 1985), which I edited, discusses vitamin toxicity in detail and describes most of the well-designed clinical trials done to test whether vitamin C prevents colds.*

Radioisotopes

I approach my self-imposed task of criticizing Glenn Seaborg's article on radioisotopes (*SI,* January/February 1995) with considerable trepidation. He is such a towering scientific figure and I am so insignificant.

I do not believe that the relatively well-informed and sophisticated audience of this magazine needs a primer on the benefits to society of nuclear medicine and nuclear technology in general. What could be used is an analytical discussion of the ethics involved in experimentation then and now. . . .

We don't need cheerleading, rah! rah! articles boosting scientific innovation in the SKEPTICAL INQUIRER. Most of us are already on the team. What is needed, I think, is a sober analysis by an eminent thinker of how we conduct our experiments and whether (and how) our ethical standards need improvement.

David J. Simmons
Ridgecrest, Calif.

Glenn Seaborg strongly defends the testing of patients with nuclear isotopes half a century ago. But, if I recall correctly, what has aroused people's indignation is not that the tests were performed, but that they were performed on people who did not give informed consent. His points about the value of radioisotopes strike me as valid, but they do not address the ethical issue of performing tests on subjects without their consent.

Gary McGath
Hooksett, N.H.

The Astonishing Hypothesis

I like your new format.

I have one observation about Francis Crick's piece on the Astonishing Hypothesis. In it he says:

"In short, your brain constructs what you see from the incoming information and from your past experience (and from the *experience* of your ancestors embodied in your genes)" [my emphasis].

This statement smacks of Lysenkoism. I'm sure that it was not what he intended to say, but it came out wrong. When I try to rewrite the sentence the best I can do is to leave out some words so that it reads: ". . . and from your ancestors, embodied in your genes."

Bernard S. Edwards
Richmond, Va.

Science and the 'Mars effect'

I was reading about the so-called Mars effect (From the Chairman, *SI,* January/February 1995), and it occurred to me to offer a rather simple argument

that might help to resolve this interminable business, and perhaps some other matters as well.

Science consists of the development of a model of "reality," in words and symbols, that demonstrates what does and doesn't happen, what causes what, and how it all works. The principle on which this model rests is that of internal consistency, meaning that if two parts of this model contradict each other, something is wrong.

The problem with the so-called paranormal is that it is based entirely on a simple misunderstanding. Science does not say what can and can't exist; it merely notices what happens and then looks for the explanation most consistent with its model. And if something definitely happens and can't be fitted into its present model, it is happy to look for a better model. The simple misunderstanding on which any discussion of the "paranormal" depends is best illustrated by an example, and I will use the "Mars effect."

First, any such effect, if it existed, would then be real, part of the natural world, and as such no different from any other natural phenomenon. Second, because it wasn't noticed by science, and science can find no good evidence of it even when it tries, the "effect" is obviously so insignificant or uninteresting that it requires no serious investigation, and even if real would require no fundamental adjustment of our model of reality, since natural events only ever merit provisional "explanation," which are *all* open to revision at any time. . . . Third, if the Mars effect is real, that is simply an isolated fact. It has nothing whatever, either empirically or logically, to do with any other so-called paranormal phenomenon. And if *any* of them had any detectable effect on anything, then by definition that effect could be detected, investigated, and fitted into a more complete, but still entirely scientific and natural, model of reality.

The problem with the "Mars effect," and every other "paranormal" silliness, is that it is so irrelevant, so peripheral, so uninteresting, that unless there is some good evidence that it actually happens, no one who might be interested in explaining it properly will have any reason to do so. And those who do continue to bother with it will go on fudging the evidence and making up silly theories as long as anyone will listen, or more probably continue to pursue their illogical obsession in confused isolation. . . . When we use the words "normal" and "natural," we use them simply to mean "what really happens"; and so, logically, if they did find evidence of a "Mars effect," all that would actually prove is that it was a normal, though obviously not very significant or even interesting, phenomenon. The most likely reason that no one can unambiguously find any "Mars effect" is that it is not just uninteresting, irrelevant, and silly; but that there is no such thing.

Timothy Mead
Hagersville, Ontario
Canada

Us vs. Them?

I eagerly picked up the new, large-format January/February issue of *SI* and started reading straight through. I read about Linus Pauling's straying into pseudoscience and went on, tinged with regret at the fall of a great man. As I read Keay Davidson's "Everyone Has a Theory!" letter to cranks, though, a sense of unease crept over me. Linus Pauling's example notwithstanding, I cannot believe, as Davidson's letter says, that science is only "a business for competent professionals, not for armchair science buffs.

Many great contributions to science have been made by "armchair science buffs." Only in recent times do we see science as a job reserved for professionals. To me, a professional scientist is one whose research is driven by the available jobs, not by a sense of wonder. And whatever sense of wonder there is often dies in a toxic intellectual wasteland of grant applications and academic politics.

In Carl Sagan's article "Wonder and Skepticism," in the same issue, he says: "The chief deficiency I see in the skeptical movement is its polarization: Us vs. Them—the sense that we have a monopoly on the truth."

It's the same with science! We tell people that science can only be done by Trained Professionals—Don't Try This At Home! and then decry the lack of the public's scientific knowledge. We tell them: "You must learn *about* science, but don't think you can possibly critique or contribute to it. Stuff and nonsense. Crank letters and misguided scientists will always be with us, but we must tolerate and treat them gently, lest we discourage amateurs and people going outside their area of expertise. It's sad that current mores deny "nonprofessionals" the opportunity to participate in the intellectual and scientific life of Western society. We must do what we can to combat this. Until we find it expected that carpenters and plumbers appreciate and participate in science, most of our public will remain ignorant. . . .

Keith Conover, M.D.
Clinical Assistant Professor
Division of Emergency Medicine
University of Pittsburgh
Pittsburgh, Pa.

The Roswell Incident

Congratulations on *SI*'s new look and thanks with a couple reservations for the mini-review of my "Roswell Incident" research monograph, *Roswell in Perspective* ("New Books," *SI*, January/February 1995).

Contrary to your misrepresentation of my views, I do *not* believe in crashed flying saucers. I *do* hold the door open to the *possibility* that "saucers" exist and *may* have crashed. This is not a fine distinction, and nothing in *Roswell in Perspective* could possibly leave an objective reader with any doubt about my thinking on this matter.

Contrary to your uncritical acceptance of it, the Air Force report on Roswell does not explain the incident, even "essentially." It provides a substantial body of evidence that very strongly and convincingly suggests the debris that created the public excitement in the first place was from a very sensitive Army Air Force project code-named Mogul, a connection that Robert Todd and I discovered independently of each other and the Air Force. However, the report also quite irresponsibly and unprofessionally dismisses "the rest of the story," the strange bodies and associated wreckage reported to be in Army custody at Roswell Army Air Field at about the same time, and which in my opinion all but certainly had no connection with the Mogul debris. (For those *SI* readers who may be interested, my "Roswell, the Air Force,

and Us" in the *International UFO Reporter* [November/December 1994] addresses the strengths and shortcomings of the Air Force report.)

Karl T. Pflock
Placitas, N.M.

Editor's note: *Here are three relevant sentences from the 1994 Air Force report (pp. 5-7) that was excerpted in the January/February issue: "The relatively simple description of sticks, paper, tape, and tinfoil [from the "rather benign" original newspaper reports] has since grown to exotic metals with hieroglyphics and fiber optic-like materials, . . . two crash sites . . . , and at the second site, alleged bodies of extraterrestrial aliens. . . . What is uniquely lacking in the entire exploration and exploitation of the 'Roswell Incident' is official positive documentary evidence of any kind that supports the claims of those who allege that something unusual happened. . . . Many of these claims appear to be hearsay, undocumented, taken out of context, self-serving, or otherwise dubious. . . ."*

Poor schoolbooks

I'd like to add one additional thought to the letter from Ann Finlayson (*SI*, January/February 1995) regarding Frank Reuter's article "The Synthetic Mind Clashes with the Reductionist Text" (*SI*, Summer 1994).

While I totally agree that correct information and good organization (of which paragraphing is one aspect) are essential in order to have good science textbooks, the real culprit in producing textbooks that aren't effective is *voice*. In short, science textbooks are boring. Many textbooks are written in a flat, "just-the-facts, ma'am" stilted style that does not invite interest.

"Voice separates writing that is read from writing that is not read. . . . Voice is the writer revealed" (Donald Murray). "Good writing is supposed to evoke sensation in the reader—not the fact that it's raining, but the feel of being rained upon" (E. L. Doctorow).

Voice is the difference between the army manual and Carl Sagan and between legal documents and Stephen Hawking.

Judith A. Arter
Beavercreek, Ore.

The "dumbing down" of schoolbooks seems a symptom of the equality kick on which the world is currently high. The apparent fact that some people are smarter than others seems to many unfair and undemocratic, so we should pretend that they are in fact equal and suppress evidence to the contrary. If most people's brains are still on the *Homo erectus* level, we should try to make a *H. erectus* out of everybody.

The French revolutionary François Babeuf (1760-1797) carried the ideal of equality to the point of denouncing anyone who, by working harder or more skillfully than others, raised himself economically above them. Such a person, said Babeuf, was "a conspirator against our precious equality," deserving condign punishment. Eventually he tried to lead an uprising against the Directoire. He failed, and the guillotine got him. . . .

Equality is a fine ideal, but like others it can be pursued to absurdity.

L. Sprague de Camp
Plano, Texas

Popularizing science

The discussion of science literacy in the News and Comment section of your January/February 1995 issue concludes by asserting that it is up to scientists to popularize science. However, we are in a high-tech media age, and any popularizing of science must compete with massive high-tech popularizing of unscientific and antiscientific notions and attitudes that we are assailed with every day. Scientists in education are already trying to raise the level of scientific literacy to the best of their abilities, and only marginal improvement can be expected in that area.

This is a field that CSICOP should move into, and not in the guise of a new priesthood in white lab coats talking incomprehensible double-talk, nor in that of a Gee-Whiz Mr. Science TV program for kids that tries to sell science as a form of magic, nor even in that of the SKEPTICAL INQUIRER, which is perceived by the scientifically indifferent as a spoil-sport new Calvinism saying, "No, you mustn't believe that," referring to dozens of intriguing ideas. Surely there is a way of modeling an attitude of wonder toward nature, of pleasure in engaging in it, and of responsibility in reaching conclusions that would show how much better such an attitude is than an inclination to accept fringe notions.

Naturally additional funds would be required to produce the video and CD-ROM materials that I am suggesting, but experience shows that real information can have a wide audience, and when there's an audience, funds can be found.

John W. Barthel
Uxbridge, Mass.

UFOs or UVPs?

Why do we skeptics even continue to discuss the subject of UFOs under that particular acronym? Doesn't this already give the game away by explicitly recognizing them as "objects" that are "flying" and only need to be "identified"?

Unless and until somebody brings us a real palpable object that we can examine, why don't we insist on referring to all such claims as, perhaps, "UVPs: Unexplained Visual Perceptions" or some other more accurate categorization? Alternative candidates welcomed.

A. E. Siegman
Professor of Engineering
Stanford University
Stanford, Calif.

A. E. Siegman is of course correct. In one of our early issues (Fall 1979), Anthony Standen wrote a short article expressing the same concerns and suggesting "Unexplained Aerial Appearance" (UAA) as an alternative. Unfortunately, "UFO," with all its regrettably misleading connotations, is fully ingrained in the language.—EDITOR

The letters column is a forum for views on matters raised in previous issues. Letters should be no more than 250 words. Due to the volume of letters, not all can be published. They should be typed double-spaced. Address: Letters to the Editor, SKEPTICAL INQUIRER, 944 Deer Dr. NE, Albuquerque, NM 87122.

GUIDE FOR AUTHORS

The **Skeptical Inquirer** critically examines claims of paranormal, fringe-science, and pseudoscientific phenomena from a responsible, scientific point of view and provides a forum for informed discussion of all relevant issues. It encourages science and scientific inquiry, critical thinking, and the use of reason and the methods of science in examining important issues. The readership includes scholars and researchers in many fields and lay readers of diverse backgrounds. Write clearly, interestingly, and simply. Avoid unnecessary technical terms. Maintain a factual, professional, and restrained tone. All submissions are judged on the basis of interest, clarity, significance, relevance, authority, and topicality.

Direct critiques toward ideas and issues, not individuals. Authors should be prepared to provide documentation of all factual assertions. A useful set of guidelines for those who seek to evaluate paranormal claims, titled "Proper Criticism" and written by Professor Ray Hyman, is available from the Editor. Among the guidelines: clarify your objectives, let the facts speak for themselves, be precise and careful with language, and avoid loaded words and sensationalism. State others' positions in a fair, objective, and nonemotional manner.

CATEGORIES OF PAPERS

Categories of contributions include Articles, Book Reviews, News and Comment, Forum, Follow-Up, and Letters to the Editor.

Articles: Articles may be evaluative, investigative, or explanatory. They may examine specific claims or broader questions. Well-focused discussions on scientific, educational, or social issues of wide common interest are welcome. We especially seek articles that provide new information or bring fresh perspective to familiar subjects. Articles that help people gain an understanding through naturalistic terms of unusual personal experiences are useful. So are articles that portray the vigor and excitement of a particular scientific topic and help readers distinguish between scientific and pseudoscientific approaches to answering key outstanding questions. Well-balanced articles that report on and evaluate controversial scientific claims within science itself are also needed.

Space is at a premium; there are always many accepted articles awaiting publication, and many submitted articles cannot be published. Be succinct. Articles are typically 2,000 to 3,500 words (about 8 to 12 double-spaced typewritten pages, depending upon font size). We cannot publish treatises. Articles should be organized around one central point or theme. If something is important it can be said briefly. Remember, Watson and Crick's paper reporting the discovery of the structure of DNA took just over one page in *Nature*.

The SKEPTICAL INQUIRER must be a source of authoritative, responsible scientific information and perspective. The Editor will usually send manuscripts dealing with technical or controversial matters to reviewers. The authors, however, are responsible for the accuracy of fact and perspective. It is good practice to have knowledgeable colleagues review drafts before submission. Reports of original research, especially highly technical experimental or statistical studies, are best submitted to a formal scientific journal; a nontechnical summary may be submitted to the SKEPTICAL INQUIRER. Studies based on small- scale tests or surveys of students will be considered only if they establish something new, provide a needed replication of some important earlier study, or test some new theoretical position.

Articles should have a title page that begins with a succinct, inviting title followed by a concise, 10- to 20- word statement of the article's main point or theme. This will be set in display type on the first page of the published article. The title page should also give the author's name and address. Include a brief cover letter stating that the article has not been submitted elsewhere and giving the authors' titles and affiliations and the lead author's address and home and office telephone and fax numbers (important!). Include information in the letter or at the end of the manuscript for a one or two-sentence author note. If you do not wish your address given in the author note, please so state.

Book Reviews: Most book reviews are about 600 to 1,200 words. Both solicited and unsolicited reviews are used. Include publication data at the top of the review in this order: Title. Author. Publisher, city, year. Number of pages. Hardcover or paperback (or both), price. Include a suggested author note. If possible, include the cover of the book for illustration.

News and Comment: News articles from 250 to 1,000 words are welcome. They should involve timely events and issues and be written in interpretative journalistic style. Use third person. The news sections of *Nature*, *Science*, *New Scientist*, and *Science News* are excellent models. Balance, fairness, and perspective are important. In reporting on controversies, seek and include comment and perspective from the various opposing parties.

Forum: The Forum column consists of brief, lively, well-written columns of comment and opinion generally no more than 1,000 words. Space allows only one or two per issue.

Follow-Up: The Follow-Up column is for response from persons whose work or claims have been the subject of previous articles. The original authors may respond in the same or a later issue.

Letters to the Editor: The Letters to the Editor section is for views on matters raised in previous issues. Letters should be no more than 250 words. Due to the volume of letters received, they cannot be acknowledged, and not all can be published. Those selected may be edited for space and clarity. Authors whose articles are criticized in the letters column may be given the opportunity to respond in the same issue.

MECHANICAL REQUIREMENTS FOR MANUSCRIPTS

Text: Type all manuscripts double-spaced, including notes and references, on 8 1/2"x 11" white opaque bond paper (not onionskin or erasable bond) with at least one-inch margins on all sides. If longer paper is used (e.g., A4), allow commensurately bigger top and bottom margins. Number all pages in sequence, including those for references, figures, and captions. For Articles, submit an original and two photocopies (for reviewers); for other categories, an original and one photocopy.

References and Notes: For reference citations in text, use author-date style: Smith (1994) or (Smith 1994). Arrange entries within References section alphabetically by the last name of author. Give full names of journals. Lower-case article titles except for first word and proper names. Follow the style used in recent issues for other specifics. If explanatory notes are required, number them sequentially and include them in a Notes section preceding the References.

Important: We strongly encourage camera-ready illustrations with all submissions. Figures and graphs should be in high-quality camera-ready form. Photos can be glossy or matte black-and-white. Color photos are also acceptable. Assign each illustration a Figure number and supply captions on a separate sheet. Suggestions for obtaining other illustrations are welcome.

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- Encourages research by objective and impartial inquiry in areas where it is needed
- Convenes conferences and meetings
- Publishes articles that examine claims of the paranormal
- Does not reject claims on a priori grounds, antecedent to inquiry, but examines them objectively and carefully

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