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ASTRAL PROJECTION AND THE



article
By **CARL SAGAN**

PLANT'S "HEARTBEAT" THRILLS
SCIENTISTS AT OXFORD MEETING
Hindu Savant Causes Further Sen-
sation by Showing "Blood" of Plant
Flowing

AUDIENCE SITS ABSORBED
Watches with Rapt Attention as
Lecturer Submits Snapdragon to
Death Struggle

—*The New York Times*,
August 7, 1926, Page 1

HORSE THAT COULD COUNT

*ufos, magical
pyramids, bermuda
triangles and other
strange phenomena —
examined in the
cold light of reason*

IN THE SECOND CENTURY A.D., in the reign of Marcus Aurelius, there lived in Greece a master con man named Alexander of Abonutichus—handsome, clever and totally unscrupulous, he, in the words of one of his contemporaries, “went about living on occult pretensions.” In his most famous imposture, “he rushed into the market place, naked except for a gold-spangled loincloth; with nothing but this and his scimitar, and shaking his long,

loose hair, like fanatics who collect money in the name of Cybele, he climbed onto a lofty altar and delivered a harangue” predicting the advent of a new god. Alexander then raced to the construction site of a new temple, the crowd streaming after him, and discovered—where he had previously emplaced it—a goose egg in which he had secretly sealed a baby snake. Opening the egg, he announced the snakelet as the god he had

prophesied. After retiring to his house for a few days, Alexander admitted the breathless crowds, who observed his body now entwined with a large serpent: The snake had grown impressively in the interim. The serpent was, in fact, of a large and conveniently docile variety, procured for this purpose earlier in Macedonia and outfitted with a linen head of somewhat human countenance. The room was dimly lit. Because of the

press of the crowd, no visitor could stay for very long or inspect the serpent very carefully. The opinion of the multitude was that Alexander had, indeed, delivered a god.

Alexander then announced that the god would give answers to written questions delivered in sealed envelopes. When alone, he would then lift off or duplicate the seal, read the message, re-make the envelope and attach an oracular answer. People flocked to this marvel from the periphery of the Empire as well as from Rome, its capital. In those cases where the oracle later proved not just ambiguous but dead-wrong, Alexander had a simple solution: He altered the record of what response he had given. And should the question of a rich man or woman reveal some weakness or guilty secret, Alexander proved not to scruple at extortion. The result of all these activities was an income equivalent to several hundred thousand dollars per year and fame rivaled by few men of his time.

We may smile at Alexander the Oracle-Monger. We understand that people would like to foretell the future and make contact with the gods. But we would not nowadays be taken in by such a fraud. Or would we? M. Lamar Keene spent 13 years as a spiritualist medium. He was pastor of the New Age Assembly Church in Tampa, a trustee of the Universal Spiritualist Association and for many years a leading figure in the mainstream of the American spiritualist movement. He is also a self-confessed fraud, who believes, from firsthand knowledge, that virtually all spirit readings, séances and mediumistic messages from the dead are conscious deceptions, contrived to exploit the grief and longing we feel for deceased friends and relatives. Keene, like Alexander, would answer questions given to him in sealed envelopes—in this case, not in private but on the pulpit. He viewed the contents with a bright concealed light or by smearing lighter fluid, either of which can render the envelope momentarily transparent. He would find lost objects, present people with astounding revelations about their private lives that “no one could know,” commune with the spirits and materialize ectoplasm in the darkness of the séance—all based on the simplest tricks, an unswerving self-confidence and, most of all, on the monumental credulity, the utter lack of skepticism he found in his parishioners and clients. Keene believes, as did Harry Houdini, not only that such fraud is rampant among the spiritualists but also that they are highly organized to exchange data on potential clients, in order to make the revelations of the séance more astonishing. Like the viewing of

Alexander's serpent, the séances all take place in darkened rooms—because the deception would be too easily penetrated in the light. In his peak earning years, Keene earned well over \$100,000 a year for his church.

From Alexander's time to our own—indeed, probably for as long as human beings have inhabited this planet—people have discovered they can make money by pretending to arcane or occult knowledge. A charming and enlightening account of some of these bamboozles can be found in a remarkable book published in 1852 in London, *Extraordinary Popular Delusions and the Madness of Crowds*, by Charles Mackay. The late Bernard Baruch claimed that the book saved him millions of dollars—presumably by alerting him to which idiot schemes he should not invest his money in. Mackay's treatment ranges from alchemy, prophecy and faith healing to haunted houses, the Crusades and the “influence of politics and religion on the hair and beard.” The value of the book, like the accounts of Alexander the Oracle-Monger, lies in the remoteness of the frauds and delusions described. Many of the impostures do not have a contemporary ring and only weakly engage our passions: It becomes clear how people in other times were deceived. But after reading many such cases, we begin to wonder what the comparable contemporary versions are. People's feelings are as strong as they always were and skepticism is probably as unfashionable today as in any other age. Accordingly, there ought to be bamboozles galore in contemporary society. And there are.

In Alexander's time, as in Mackay's, religion was the source of most accepted insights and prevailing world views. Those intent on bamboozling the public often did so in religious terms. This is, of course, still being done, as the testimony of penitent spiritualists attests. But in the past 100 years—whether for good or for ill—science has emerged in the popular mind as the primary means of penetrating the secrets of the universe, and so we should expect many contemporary bamboozles to have a scientific ring. And they do.

Today there are many claims made at the edge or border of science—assertions that excite popular interest and, in many cases, that would be of profound scientific importance if only they were true. They are out of the ordinary, a break from the humdrum world, and often imply something hopeful: for example, that we have vast, untapped powers; or that unseen forces are about to save us from ourselves; or that there is a still unacknowledged pattern and harmony to the universe. Well, science does sometimes make such claims—as, for example,

the realization that the hereditary information that we pass from generation to generation is encoded in a single long molecule called DNA; in the discovery of universal gravitation or continental drift; in the tapping of nuclear energy; in research on the origin of life or on the early history of the universe. So if some additional claim is made—for example, that it is possible to float in the air unaided, by a special effort of will—what is so different about that? Nothing. Except for the matter of proof. Those who claim that levitation occurs have an obligation to demonstrate their contention. The burden of proof is on them, not on those who might be skeptical. Many claims of levitation have been made in the past 100 years, but photographs of people rising 15 feet into the air have never been taken under conditions that exclude fraud.

Or, to take another example, consider what is sometimes called astral projection. Under conditions of religious ecstasy or hypnagogic sleep or sometimes under the influence of a hallucinogen, people report the distinct sensation of stepping outside the body, leaving it, effortlessly floating to some other place in the room (often near the ceiling), and only at the end of the experience re-emerging with the body. If such a thing can actually happen, it is certainly of great importance; it implies something about the nature of human personality and even about the possibility of “life after death.” Indeed, some people who have had near-death experiences, or who have been declared clinically dead and then have revived, report similar sensations. But the fact that a sensation is reported does not mean that it occurred as claimed. There might, for example, be a common wiring defect in human neuroanatomy that leads under certain circumstances always to the same illusion of astral projection.

There is a simple way to test astral projection. In your absence, have a friend place a book face up on a high and inaccessible shelf in the library. Then, if you ever have an astral-projection experience, float to the book and read the title. When your body reawakens and you correctly announce what you have read, you will have provided some evidence for the physical reality of astral projection. But, of course, there must be no other way for you to know the title of the book, such as sneaking a peek when no one else is around or being told by your friend or by someone your friend tells. To avoid the latter possibility, the experiment should be done “double blind”; that is, someone quite unknown to you must select and place the book and should be entirely unaware of your



"How do you spell Martian?"

existence. To the best of my knowledge, no demonstration of astral projection has ever been reported under such controlled circumstances with skeptics in attendance. I conclude that while astral projection is not excluded, there is little reason to believe in it. On the other hand, there is some evidence accumulated by a University of Virginia psychologist that young children in India and the Near East report in great detail a previous life in a moderately distant locale that they have never visited; further inquiry demonstrates that a recently deceased person fits the child's description very well. But this is not an experiment performed under controlled conditions and it is at least possible that the child has overheard or been told information about which the investigator is unaware.

While some modern claims at the edge of science may be the product of outright fraud, most of them appear to be due to a lack of vigorous skepticism on the part of the believers or because the phenomenon itself is subtle and inaccessible. In the early years of the 20th Century, there was a horse in Germany that could read and do mathematics and that exhibited a deep knowledge of world political affairs. Or so it seemed. The horse was called Clever Hans. He was owned by Wilhelm von Osten, an elderly Berliner whose character was such, everyone said, that fraud was out of the question. Delegations of distinguished scientists viewed the equine marvel and pronounced it genuine. Hans would reply to questions put to him by coded taps (one tap for yes, say, and two taps for no) and would answer mathematical problems in the same way. For example, someone would say, "Hans, how much is twice the square root of nine, less one?" After a moment's pause, Hans would dutifully raise his right foreleg and tap five times. Was Moscow the capital of Russia? Two taps. How about St. Petersburg? One tap. The Prussian Academy of Sciences sent a commission, headed by Oskar Pfungst, to take a closer look; Von Osten, who believed fervently in Hans's powers, welcomed the inquiry. Pfungst noticed a number of interesting regularities. The more difficult the question, the longer it took Hans to answer. When Von Osten did not know the answer, Hans exhibited a comparable ignorance. When Von Osten was out of the room or when the horse was blindfolded, no correct answers were forthcoming. The solution then seemed clear. When a question would be put to Hans, Von Osten would become slightly tense, for fear that Hans would make too few taps. When Hans, however, reached the correct number of taps, Von Osten unconsciously and imperceptibly relaxed—imperceptibly to

virtually all human observers but not to Hans, who was rewarded with a sugar cube for correct answers. Hans was totally ignorant of mathematics but very sensitive to unconscious nonverbal cues. Clever Hans was aptly named; he was a horse who had operant-conditioned a human being. But despite the unambiguous nature of Pfungst's evidence, similar stories of counting, reading and politically sage horses, pigs and geese continue to plague the gullible of many nations.

In recent years, perhaps the most popular of these doctrines have to do with flying saucers, ancient astronauts, the Bermuda Triangle and other regular polygons with diffuse geographical boundaries. This interest, I believe, reflects in part the growing awareness that contact with extraterrestrial life is now a real possibility. This is a matter of paramount scientific, philosophical and social importance. The subject is now scientifically respectable and there is a large and growing body of scientific literature on it. However, very little of the scientific work in this area reaches the public eye. Instead, there are innumerable magazines, paperbacks and television programs based on undemonstrated contentions that such contact has already been achieved.

Advocates of ancient astronauts—most notably, Erich von Däniken in his book *Chariots of the Gods?*—assert that there are numerous pieces of archaeological evidence that can be understood only in terms of past contact by extraterrestrial civilizations with our ancestors. An iron pillar in India; a plaque in Palenque, Mexico; the Pyramids of Egypt; the stone monoliths (all of which, according to Jacob Bronowski, resemble Benito Mussolini) on Easter Island; and the geometrical figures in Nazca, Peru, are each alleged to have been manufactured by or under the supervision of extraterrestrials. But in every case, the artifacts in question have plausible and much simpler explanations. Our ancestors were no dummies. They may have lacked high technology, but they were as smart as we, and they sometimes combined dedication, intelligence and hard work to produce results that impress even us. The most recent version of the ancient-astronaut story is the claim that the Dogon people in the Republic of Mali have an astronomical tradition relating to the star Sirius that they could not possibly have acquired without the use of the telescope. This seems correct, but the most likely explanation is that Europeans who used the telescope—or at least those who read about it—stopped by for a chat with the Dogon.

It is not surprising that Pyramids have played a role in ancient-astronaut

writings; ever since the Napoleonic invasions of Egypt impressed ancient Egyptian civilization on the consciousness of Europe, they have been the focus of a great deal of nonsense. Much has been written about supposed numerical information stored in the dimensions of the Pyramids, especially the Great Pyramid of Giza, so that, for example, the ratio of height to width in certain units is said to be the time between Adam and Jesus in years. In one famous case, a pyramidologist was observed filing a protuberance so that the observations and his speculations would be in better accord. The most recent manifestation of interest in pyramids is "pyramidology," the contention that we and our razor blades feel better and last longer inside pyramids than inside cubes. Maybe. I find living in cubical dwellings depressing, and for most of our history, humans did not live in such quarters. But the contentions of pyramidology, under appropriately controlled conditions, have never been verified. The burden of proof, again, has not been met.

The Bermuda Triangle "mystery" has to do with unexplained disappearances of ships and airplanes in a vast region of the ocean around Bermuda. The most reasonable explanation for these disappearances (when they actually occur; many of the alleged disappearances turn out simply never to have happened) is that the vessels sank. I once objected on a television program that it seemed strange for ships and airplanes to mysteriously disappear but never trains; to which the host, Dick Cavett, replied, "I can see you've never waited for the Long Island Railroad." As with the ancient-astronaut enthusiasts, the Bermuda Triangle advocates use sloppy scholarship and rhetorical questions. But they have not provided compelling evidence. They have not met the burden of proof.

Flying saucers or UFOs are well known to almost everyone. But seeing a strange light in the sky does not mean that we are being visited by beings from the planet Venus. It might, for example, be an automobile headlight reflected off a high-altitude cloud, or an unconventional aircraft, or a conventional aircraft with unconventional lighting patterns, such as a high-intensity searchlight used for meteorological observations. There are also a number of cases—closer encounters with some highish index numeral—where one or two people claim to have been taken aboard an alien spaceship, prodded and probed with unconventional medical instruments and released. But in those cases, we have only the unsubstantiated testimony of one or two people. To the best of my knowledge, there are

(continued on page 226)

ASTRAL PROJECTION (continued from page 86)

"Those skeptical of many borderline belief systems are not necessarily those afraid of novelty."

no instances out of the 1,000,000 UFO reports filed since 1947—not a single one—in which many people independently and reliably report a close encounter with what is clearly an alien spacecraft. Not only is there an absence of good anecdotal evidence; there is no physical evidence either. Our laboratories are very sophisticated. A product of alien manufacture might readily be identified as such. Yet no one has ever turned up even a small fragment of an alien spacecraft that has passed any such physical test—much less the logbook of the starship captain. It is for these reasons that NASA recently declined an invitation from the Executive Office of the President to undertake a serious investigation of UFO reports. When hoaxes and mere anecdotes are excluded, there seems nothing left to study.

The interest in UFOs and ancient astronauts seems at least partly due to unfulfilled religious needs. The extraterrestrials are often described as wise, powerful, benign, human in appearance

and sometimes attired in long white robes. They are very much like gods and angels, coming from other planets rather than from heaven, using spaceships rather than wings. There is a little pseudo-scientific overlay, but the theological antecedents are clear: In many cases, the supposed ancient astronauts and UFO occupants are deities, feebly disguised and modernized but easily recognizable. Indeed, a recent British survey suggests that more people believe in extraterrestrial visitations than in God.

Classical Greece was replete with stories in which the gods came down to earth and conversed with human beings. The Middle Ages were equally rich in apparitions of saints and virgins. Gods, saints and virgins were all recorded repeatedly over centuries by people of the highest reliability. What has happened? Where have all the virgins gone? What has happened to the Olympian gods? Have those beings simply abandoned us in recent and more skeptical times? Or could those early reports be

due to superstition and credulity and the unreliability of witnesses? And this suggests a possible social danger from the proliferation of UFO cultism: If we believe that benign extraterrestrials will solve our problems, we may be tempted to exert less than our full measure of effort to solve them ourselves—as has occurred in millennialist religious movements many times in human history.

Those skeptical of many borderline belief systems are not necessarily those afraid of novelty. For example, many of my colleagues and I are deeply interested in the possibility of life, intelligent or otherwise, on other planets. But we must be careful not to foist our wishes and fears upon the cosmos. Instead, in the best scientific tradition, our objective is to find out what the answers really are, independent of our emotional predispositions. If we are alone, that is a truth worth knowing also. No one would be more delighted than I if intelligent extraterrestrials were visiting our planet. It would make my job enormously easier. Indeed, I have spent more time than I care to think about on the UFO and ancient-astronaut questions. And public interest in these matters is, I believe, at least in part, a good thing. But our openness to the dazzling possibilities presented by modern science must be tempered by some hard-nosed skepticism. Many interesting possibilities simply

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turn out to be wrong. An openness to new possibilities and a willingness to ask hard questions are both required to advance our knowledge. And the asking of tough questions has an ancillary benefit: Political life in America in the past decade and a half has been marked by an excessive public credulity, an unwillingness to ask difficult questions, which has produced a demonstrable impairment in our national health. Both in science and in politics, there is an important benefit in sharpening our abilities to perform skeptical scrutiny.

Professional scientists generally have to make a choice in their research goals. There are some objectives that would be very important if achieved, but the likelihood of success seems so small that no one is willing to pursue them. For many years, this was the case in the search for extraterrestrial intelligence. The situation has now changed, mainly because advances in radio technology now permit us to construct enormous radio telescopes and sensitive receivers to pick up any messages that might be sent our way. Never before in human history was this possible. The opposite shoal is to investigate problems that are perfectly tractable but of entirely trivial significance. Most scientists choose a middle course. As a result, very few of them actually plunge into the murky waters of testing or challenging borderline or pseudoscientific beliefs. The chance of finding out something really interesting—except about human nature—seems small, and the amount of time that is required seems large. I believe that scientists should spend more time in discussing these issues; but the fact that a given contention does not have vigorous scientific opposition does not imply that scientists think it is reasonable.

There are many cases where the belief system is so absurd that scientists dismiss it instantly but never commit their arguments to print. I believe this is a mistake. Science, especially today, depends upon public support. We live in a society that is powerfully influenced by science and technology but in which people have, unfortunately, a very inadequate knowledge of science and technology. This makes intelligent decision-making on scientific issues difficult. Some of the pseudo science is a profitable enterprise and there are proponents who not only are strongly identified with the issue in question but who also make large amounts of money from it. They are willing to commit major resources to defending their contentions. Some scientists seem unwilling to engage in public confrontations on borderline science issues because of the effort required and because of the possibility that they will be perceived to lose a public debate. But it is an excellent opportunity

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to show how science works at its murkier borders, and also a way to convey something of the power as well as the pleasures of science.

There is a problem not only with excessive public gullibility but also with excessive scientific aloofness. A distinguished scientist once threatened to sic then-Vice-President Agnew on me if I persisted in organizing a meeting of the American Association for the Advancement of Science in which both proponents and opponents of the extraterrestrial-spacecraft hypothesis of UFO origins would be permitted to speak. Scientists offended by the conclusions of Immanuel Velikovsky's *Worlds in Collision* and irritated by Velikovsky's total ignorance of many well-established scientific facts successfully and shamefully pressured Velikovsky's publisher to abandon the book—which was then put out by another firm, much to its profit. I organized another A.A.A.S. symposium to discuss Velikovsky's ideas and was criticized by a different leading scientist, who argued that any public attention, no matter how negative, could only help those contentions of cometary and planetary collisions in the recent past. Samuel Goldwyn allegedly said, "Publicity is good and good publicity is even better." But the symposia were held, the audiences seemed to find them interesting, the proceedings were published, and now youngsters in Duluth or Fresno can find in their libraries some books presenting the other side of the issues. If science is presented poorly in schools and newspapers and on television, perhaps some interest in science can be excited by well-prepared, comprehensible public discussions at the edge of science. Astrology can be used for discussions of astronomy; alchemy for chemistry; Velikovskyan catastrophism and lost continents such as Atlantis for geology; spiritualism and Scientology for psychology and psychiatry.

There are still in the United States many people who believe that if a thing appears in print, it must be true. Since so much undemonstrated speculation and rampant nonsense appears in books, a curiously distorted view of what is true emerges. I was amused recently, in the furor that followed the early release of the contents of H. R. Haldeman's book, to read that the editor in chief of one of the largest publishing companies in the world said, "We believe a publisher has an obligation to check out the accuracy of certain controversial nonfiction works. Our procedure is to send the book out for an objective reading by an independent authority in the field." This is by an editor whose firm has, in fact, published some of the most egregious pseudo science of recent decades. But books presenting

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the other side of the story are now becoming available, and in the accompanying box, I have listed a few of the more prominent pseudoscientific doctrines and recent attempts at their scientific refutation. One of the contentions criticized there—that plants have emotional lives and musical preferences—had a brief flurry of interest a few years ago, including weeks of conversations with house plants in Gary Trudeau's *Doonesbury* comic strip. As the epigraph to this article shows, it is an old contention. Perhaps the only encouraging point is that it is greeted more skeptically today than in 1926.

Two years ago, a committee of scientists, magicians and others was organized to provide some focus for skepticism on the border of science. This nonprofit organization is called The Committee for the Scientific Investigation of Claims of the Paranormal and is at 923 Kensington Avenue, Buffalo, New York 14215. It is beginning to do some useful work, including in its publications the latest news on the confrontation between the

rational and the irrational—a debate that goes back to the encounters between Alexander the Oracle-Monger and the Epicureans, who were the rationalists of his day. The committee has also made official protests to the networks and the Federal Communications Commission about television programs on pseudo science that are particularly uncritical. An interesting debate has gone on within the committee between those who think that all doctrines that smell of pseudo science should be combated and those who believe that each issue should be judged on its own merits but that the burden of proof should fall squarely on those who make the proposals. I find myself very much in the latter camp. I believe that the extraordinary should certainly be pursued; but extraordinary claims require extraordinary evidence.

However, the best antidote for pseudo science, I firmly believe, is science:

• There is an African fresh-water fish that is blind. It generates a standing electric field, through perturbations in which it distinguishes between predators

and prey and communicates in a fairly elaborate electrical language with potential mates and other fish of the same species. This involves an entire organ system and sensory capability unknown to pretechnological human beings.

• There is a kind of arithmetic, perfectly reasonable and self-contained, in which two times one does not equal one times two.

• Pigeons—one of the least prepossessing animals on earth—are now found to have a remarkable sensitivity to magnetic-field strengths as small as one hundred thousandth that of the earth's magnetic dipole. Pigeons evidently use this sensory capability for navigation and sense their surroundings by their magnetic signatures: metal gutters, electrical power lines, fire escapes and the like—a sensory modality glimpsed by no human being who ever lived.

• Quasars seem to be explosions of almost unimaginable violence in the hearts of galaxies that destroy millions of worlds, many of them perhaps inhabited.

• In an East African volcanic-ash flow 3,500,000 years old, there are footprints—of a being about four feet high with a purposeful stride that may be the common ancestor of apes and men. Nearby are the prints of a knuckle-walking primate corresponding to no animal yet discovered.

• Each of our cells contains dozens of tiny factories called mitochondria that combine our food with molecular oxygen in order to extract energy in convenient form. Recent evidence suggests that billions of years ago, the mitochondria were free living organisms that have slowly evolved into a mutually dependent relation with the cell. When many-celled organisms arose, the arrangement was retained. In a very real sense, then, we are not a single organism but an array of about ten trillion beings and not all of the same kind.

• Mars has a volcano almost 80,000 feet high that was constructed about a billion years ago. An even larger volcano may exist on Venus.

• Radio telescopes have detected the cosmic black-body background radiation, the distant echo of the event called the Big Bang. The fires of creation are being observed today.

I could continue such a list almost indefinitely. I believe that this smattering of findings in modern science and mathematics is far more compelling and exciting than most of the doctrines of pseudo science. Science is more intricate and subtle, reveals a much richer universe and powerfully evokes our sense of wonder. And it has the additional and important virtue—to whatever extent the word has any meaning—of being true.

Some Recent Borderline Doctrines and Their Critiques

While many recent borderline doctrines are widely promoted, skeptical discussion and dissection of their fatal flaws are not so widely known. Here is a guide to some of those critiques.

Bermuda Triangle	<i>The Bermuda Triangle Mystery—Solved</i> Lawrence Kusche, Harper & Row, 1975
Spiritualism	<i>A Magician Among the Spirits</i> Harry Houdini, Harper, 1924; Arno Press, 1972 <i>The Psychic Mafia</i> M. Lamar Keene, St. Martin's Press, 1976; Dell, 1977
Uri Geller	<i>The Magic of Uri Geller</i> James Randi, Ballantine, 1975
Atlantis and Other "Lost Continents"	<i>Legends of the Earth: Their Geological Origins</i> Dorothy Vitaliano, Indiana University Press, 1973 <i>Lost Continents</i> L. Sprague de Camp, Ballantine, 1968, 1975
UFOs	<i>UFO's—Explained</i> Philip J. Klass, Random House, 1974 <i>UFOs: A Scientific Debate</i> Carl Sagan and Thornton Page, Eds., W. W. Norton, 1974
Ancient Astronauts	<i>The Space-Gods Revealed: A Close Look at the Theories of Erich von Däniken</i> Ronald Story, Harper, 1976 <i>The Ancient Engineers</i> L. Sprague de Camp, Ballantine, 1974
Velikovsky: <i>Worlds in Collision</i>	<i>Scientists Confront Velikovsky</i> Donald Goldsmith, Ed., Cornell University Press, 1977
The Emotional Lives of Plants	"Plant 'Primary Perception'" K. A. Horowitz and others, <i>Science</i> , August 8, 1975

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- Fads and Fallacies in the Name of Science*, by Martin Gardner, Dover, New York, 1957
- ESP, Seers & Psychics*, by Milbourne Christopher, Crowell, New York, 1970
- An Introduction to Logic and Scientific Method*, by Morris R. Cohen and Ernest Nagel, Harcourt Brace, New York, 1934
- The Natural History of Nonsense*, by Bergen Evans, Alfred A. Knopf, New York, 1946
- "Alexander the Oracle-Monger," in *The Works of Lucian of Samosata*, Volume II, Clarendon Press, Oxford, 1905