

The Arizona Skeptic

A Journal Promoting Critical Thinking

Volume 5, Issue 5

March/April 1992

About "The Vitality of Mythical Numbers" and "Truth Almost Extinct in Tales of Imperiled Species"

I came across Max Singer's "The Vitality of Mythical Numbers" as chapter 29 in *Judgment Under Uncertainty: Heuristics and Biases*, edited by Daniel Kahneman, Paul Slovic, and Amos Tversky (1982, Cambridge University Press), a book which I recommend to anyone interested in mistakes that are commonly made in human reasoning. Although the article is now 21 years old and the statistics are therefore out of date, the point it makes is still important today.

I expect Julian Simon's "Truth Almost Extinct in Tales of Imperiled Species" to raise some controversy, due to its style and content, if not because of its source of original publication (*The Washington Times*). The purpose of printing it here is not to minimize fears or incentives regarding the protection of endangered species, but rather to exemplify again how statistics can be misused or misleading—in this case, figures used by the World Wildlife Fund. Similar examples may be found in the literature of many activist groups, which sometimes put the goal of persuading the public above the goal of education. (Another, more recent example may be found in a mailing from the Drug Policy Foundation, whose goals I tend to support. In "Test Your Knowledge About Drugs," one of the true-or-false questions was "AIDS, the disease of this century and perhaps the plague of the next, is spread more by sex than by intravenous drug use," to which the answer supplied was "false," which corresponds with the DPF's emphasis on legalizing needle purchases and exchange programs. In fact, the given statement is true.) I encourage anyone who has more recent and more accurate statistics on the subject of species extinction to send them to *The Arizona Skeptic*. (A possible lead for discovering such evidence is given in an editorial footnote to Simon's article.)

Some other useful sources on numeric errors are Douglas R. Hofstadter's "On Number Numbness" in the May 1982 *Scientific American* (reprinted in his book *Metamagical Themas*, 1985, Basic Books) and John Allen Paulos' *Innumeracy: Mathematical Illiteracy and Its Consequences* (1990, Vintage).

—Editor

The Vitality of Mythical Numbers

By Max Singer

It is generally assumed that heroin addicts in New York City steal some two to five billion dollars worth of property a year, and commit approximately half of all the property crimes. Such estimates of addict crime are used by an organization like RAND, by a political figure like Howard Samuels, and even by the Attorney General of the United States. The estimate that half the property crimes are committed by addicts was originally attributed to a police official and has been used so often that it is now part of the common wisdom.

The amount of property stolen by addicts is usually estimated in something like the following manner:

There are 100,000 addicts with an average habit of \$30.00 per day. This means addicts must have some \$1.1 billion a year to pay for their heroin ($100,000 \times 365 \times \30.00). Because the addict must sell the property he steals to a fence for only about a quarter of its value, or less, addicts must steal some \$4 to \$5 billion a year to pay for their heroin.

These calculations can be made with more or less sophistication. One can allow for the fact that the kind of addicts who make their living illegally typically spend upwards of a quarter of their time in jail, which would reduce the amount of crime by a quarter. (*The New York Times* recently reported on the death of William "Donkey" Reilly. A 74-year-old ex-addict who had been addicted for 54 years, he had spent 30 of those years in prison.) Some of what the addict steals is cash, none of which has to go to a fence. A large part of the cost of heroin is paid for by dealing in the heroin business, rather than stealing from society, and another large part by prostitution, including male addicts living off prostitutes. But no matter how carefully you slice it, if one tries to estimate the value of property stolen by addicts by assuming that there are 100,000 addicts and estimating what is the minimum amount they would have to steal to support themselves and their habits (after making generous estimates for legal income), one comes up with a number in the neighborhood of \$1 billion a year for New York City.

But what happens if you approach the question from the other side? Suppose we ask, "How much property is stolen—by addicts or anyone else?" Addict theft must be less than total theft. What is the value of property stolen in New York City in any year? Somewhat surprisingly to me when I first asked, this turned out to be a difficult question to answer, even approximately. No one had any estimates that they had even the faintest confidence in, and the question doesn't seem to have been much asked. The amount of officially reported theft in New York City is approximately \$300 million a year, of which about \$100 million is the value of automobile theft (a crime that is rarely committed by addicts). But it is clear that there is a very large volume of crime that is not reported; for example, shoplifting is not normally reported to the police. (Much property loss to thieves is not reported to insurance companies either, and the insurance industry had no good estimate for total theft.)

It turns out, however, that if one is only asking a question like, "Is it possible that addicts stole \$1 billion worth of property in New York City last year?" is relatively simple to estimate the amount of property stolen. It is clear that the two biggest components of addict theft are shoplifting and burglary. What could the value of property shoplifted by addicts be? All retail sales in New York City are on the order of \$15 billion a year. This includes automobiles, carpets, diamond rings, and other items not usually available to shoplifters. A reasonable number for inventory loss to retail

establishments is 2%. This number includes management embezzlers, stealing by clerks, shipping departments, truckers, etc. (Department stores, particularly, have reported a large increase in shoplifting in recent years, but they are among the most vulnerable of retail establishments and not important enough to bring the overall rate much above 2%.) It is generally agreed that substantially more than half of the property missing from retail establishments is taken by employees, the remainder being lost to outside shoplifters. But let us credit shoplifters with stealing 1% of all the property sold at retail in New York City—this would be about \$150 million a year.

What about burglary? There are something like two and one-half million households in New York City. Suppose that on the average one out of five of them is robbed or burglarized every year. This takes into account that in some areas burglary is even more commonplace, and that some households are burglarized more than once a year. This would mean 500,000 burglaries a year. The average value of property taken in a burglary might be on the order of \$200. In some burglaries, of course, much larger amounts of property are taken, but these higher value burglaries are much rarer, and often are committed by non-addict professional thieves. If we use the number of $\$200 \times 500,000$ burglaries, we get \$100 million of property stolen from people's homes in a year in New York City.

Obviously, none of these estimated values is either sacred or substantiated. You can make your own estimate. The estimates here have the character that it would be very surprising if they were wrong by a factor of 10, and not very important for the conclusion if they were wrong by a factor of two. (This is a good position for an estimator to be in.)

Obviously not all addict theft is property taken from stores or from people's homes. One of the most feared types of addict crime is property taken from the persons of New Yorkers in muggings and other forms of robbery. We can estimate this, too. Suppose that on the average, one person in 10 has property taken from his person by muggers or robbers each year. That would be 800,000 such robberies, and if the average one produced \$100 (which it is very unlikely to do), \$8 million a year would be taken in this form of theft.

So we can see that if we credit addicts with *all* of the shoplifting, *all* of the theft from homes, and *all* of the theft from persons, total property stolen by addicts in a year in New York City amounts to some \$300 million. You can throw in all the "fudge factors" you want, add all the other miscellaneous crimes that addicts commit, but no matter what you do, it is difficult to find a basis for estimating that addicts steal over half a billion dollars per year, and a quarter billion looks like a better estimate, although perhaps on the high side. After all, there must be some thieves who are not addicts.

Thus, I believe we have shown that whereas it is widely assumed that addicts steal from \$2 billion to \$5 billion a year in New York City, the actual number is *ten* times smaller, and that this can be demonstrated by

five minutes of thought.¹ So what? A quarter billion dollars' worth of property is still a lot of property. It exceeds the amount of money spent annually on addict rehabilitation and other programs to prevent and control addiction. Furthermore, the value of the property stolen by addicts is a small part of the total cost to society of addict theft. A much larger cost is paid in fear, changed neighborhood atmosphere, the cost of precautions, and other echoing and re-echoing reactions to theft and its danger.

One point in this exercise in estimating the value of property stolen by addicts is to shed some light on people's attitudes toward numbers. People feel that there is a lot of addict crime, and that \$2 billion is a large number, so they are inclined to believe that there is \$2 billion worth of addict theft. But \$250 million is a large number, too, and if our sense of perspective were not distorted by daily consciousness of federal expenditures, most people would be quite content to accept \$250 million a year as a lot of theft.

Along the same lines, this exercise is another reminder that even responsible officials, responsible newspapers, and responsible research groups pick up and pass on as gospel numbers that have no real basis in fact. We are reminded by this experience that because an estimate has been used widely by a variety of people who should know what they are talking about, one cannot assume that the estimate is even approximately correct.

But there is a much more important implication of the fact that there cannot be nearly so much addict theft as people believe. This implication is that there probably cannot be as many addicts as people believe. Most of the money paid for heroin bought at retail comes from stealing, and most addicts buy at retail. Therefore, the number of addicts is basically—although imprecisely—limited by the amount of theft. (The estimate developed in a Hudson Institute study was that close to half of the volume of heroin consumed is used by people in the heroin distribution system who do not buy at retail, and do not pay with stolen property but

¹Mythical numbers may be more mythical and have more vitality in the area of crime than in most areas. In the early 1950s the Kefauver Committee published a \$20 billion estimate for the annual "take" of gambling in the United States. The figure actually was "picked from a hat." One staff member said: "We had no real idea of the money spent. The California Crime Commission said \$12 billion. Virgil Petersen of Chicago said \$30 billion. We picked \$20 billion as the balance of the two."

An unusual example of a mythical number that had a vigorous life—the assertion that 28 Black Panthers had been murdered by police—is given a careful biography by Edward Jay Epstein in the February 13, 1971, *New Yorker*. (It turned out that there were 19 Panthers killed, ten of them by the police, and eight of these in situations where it seems likely that the Panthers took the initiative.)

with their "services" in the distribution system.²) But while the people in the business (at lower levels) consume close to half the heroin, they are only some one-sixth or one-seventh of the total number of addicts. They are the ones who can afford big habits.

The most popular, informal estimate of addicts in New York City is 100,000-plus (usually with an emphasis on the "plus"). The federal register in Washington lists some 30,000 addicts in New York City, and the New York City Department of Health's register of addicts' names lists some 70,000. While all the people on those lists are not still active addicts—many of them are dead or in prison—most people believe that there are many addicts who are not on any list. It is common to regard the estimate of 100,000 addicts in New York City as a very conservative one. Dr. Judianne Densen-Gerber was widely quoted in 1970 for her estimate that there would be over 100,000 teenage addicts by the end of the summer. And there are obviously many addicts of 20 years of age and more.³

In discussing the number of addicts in this article, we will be talking about the kind of person one thinks of when the term "addict" is used.⁴ A better term might be "street addict." This is a person who normally uses heroin every day. He is the kind of person who looks and acts like the normal picture of an addict. We exclude here the people in the medical profession who are

²A parallel datum was developed in a later study by St. Luke's Hospital of 81 addicts—average age 34. More than one-half of the heroin consumed by these addicts, over a year, had been paid for by the sale of heroin. Incidentally, these 81 addicts had stolen an average of \$9,000 worth of property in the previous year.

³Among other recent estimators we may note a Marxist, Sol Yurick, who gives us "500,000 junkies" (*Monthly Review*, December 1970), and William R. Corson, who contends, in the December 1970 *Penthouse*, that "today at least 2,500,000 black Americans are hooked on heroin."

⁴There is an interesting anomaly about the word "addict." Most people, if pressed for a definition of an "addict," would say he is a person who regularly takes heroin (or some such drug) and who, if he fails to get his regular dose of heroin, will have unpleasant or painful withdrawal symptoms. But this definition would not apply to a large part of what is generally recognized as the "addict population." In fact, it would not apply to most certified addicts. An addict who has been detoxified or who has been imprisoned and kept away from drugs for a week or so would not fit the normal definition of "addict." He no longer has any physical symptoms resulting from not taking heroin. "Donkey" Reilly would certainly fulfill most people's ideas of an addict, but for 30 of the 54 years he was an "addict" he was in prison, and he was certainly not actively addicted to heroin during most of the time he spent in prison, which was more than half of his "addict" career (although a certain amount of drugs are available in prison).

frequent users of heroin or other opiates, or are addicted to them, students who use heroin occasionally, wealthy people who are addicted but do not need to steal and do not frequent the normal addict hangouts, etc. When we are addressing the "addict problem," it is much less important that we include these cases; while they are undoubtedly problems in varying degrees, they are a very different type of problem than that posed by the typical street addict.

The amount of property stolen by addicts suggests that the number of New York City street addicts may be more like 70,000 than 100,000, and almost certainly cannot be anything like the 200,000 number that is sometimes used. Several other simple ways of estimating the number of street addicts lead to a similar conclusion.

Experience with the addict population has led observers to estimate that the average street addict spends a quarter to a third of his time in prison. (Some students of the subject, such as Edward Preble and John J. Casey, Jr., believe the average to be over 40%.) This would imply that at any one time, one-quarter to one-third of the addict population is in prison, and that the total addict population can be estimated by multiplying the number of addicts who are in prison by three or four. Of course the number of addicts who are in prison is not a known quantity (and, in fact, as we have indicated above, not even a very precise concept). However, one can make reasonable estimates of the number of addicts in prison (and for this purpose we can include the addicts in various involuntary treatment centers). This number is approximately 14,000-17,000, which is quite compatible with an estimate of 70,000 total New York City street addicts.

Another way of estimating the total number of street addicts in New York City is to use the demographic information that is available about the addict population. For example, we can be reasonably certain that some 25% of the street addict population in New York City is Puerto Rican, and some 50% are blacks. We know that approximately five out of six street addicts are male, and that 50% of the street addicts are between the ages of 16 and 25. This would mean that 20% of the total number of addicts are black males between the age of 16 and 25. If there were 70,000 addicts, this would mean that 14,000 blacks between the ages of 16 and 25 are addicts. But altogether there are only about 140,000 blacks between the ages of 16 and 25 in the city—perhaps half of them living in poverty areas. This means that if there are 70,000 addicts in the city, one in 10 black youths are addicts, and if there are 100,000 addicts, nearly one in six are, and if there are 200,000 addicts, one in three. You can decide for yourself which of these degrees of penetration of the young black male group is most believable, but it is rather clear that the number of 200,000 addicts is implausible. Similarly, the total of 70,000 street addicts would imply 7,000 young Puerto Rican males are addicted, and the total number of Puerto Rican boys between the ages of 17 and 25 in New York City is about 70,000.

None of the above calculations is meant in any way to downplay the importance of the problem of heroin addiction. Heroin is a terrible curse. When you think of the individual tragedy involved, 70,000 is an awfully large number of addicts. And if you have to work for a living, \$250 million is an awful lot of money to have stolen from the citizens of the city to be transferred through the hands of addicts and fences into the pockets of those who import and distribute heroin, and those who take bribes or perform other services for the heroin industry.

The main point of this article may well be to illustrate how far one can go in bounding a problem by taking numbers seriously, seeing what they imply, checking various implications against each other and against general knowledge (such as the number of persons or households in the city). Small efforts in this direction can go a long way to help ordinary people and responsible officials to cope with experts of various kinds.

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Truth Almost Extinct in Tales of Imperiled Species

By Julian Simon

Front page story, *The Washington Post*, Jan. 1, 1984: "A potential biological transformation of the planet unequaled perhaps since the disappearance of the dinosaur," says Thomas Lovejoy of the World Wildlife Fund. "The folly our descendants are least likely to forgive us," says Edward O. Wilson of Harvard.

These statements typify the scary rhetoric the public hears about potential species extinction, usually a prediction that a million or more existing species could be lost to mankind in the next two decades if remedial action isn't taken at once. (To be fair, the *Post's* story was much less overheated than is usually the case with this issue.)

Yet—there is absolutely no solid evidence supporting the prediction that a million or more existing species will be lost to mankind in the next two decades if radical remedial steps are not taken by the governments of the world. A fair reading of the available data suggests a prediction perhaps one-thousandth that great. But the conservationists are beating the big drum for money and action based on their frightening claims.

A recent fund-raising pitch from the World Wildlife Fund-U.S., signed by its president, Russell E. Train, describes in detail how the organization rallied support for reauthorization of the Endangered Species Act, which Mr. Train asserts was itself endangered. They did so by informing Congress that "some scientists believe that up to 1 million species of life will become extinct by the end of this century" unless governments "do something" about it.

"When we talk about the loss of 1 million species," Train says in his letter, "we are talking about a global loss with consequences that science can scarcely begin to predict.

"The future of the world could be altered drastically if we allow a million species to disappear by the year 2000."

I couldn't agree more; the sudden disappearance of a million life forms would have major ecological effects. However, the WWF prediction completely lacks factual basis.

WWF backs the million-species claim only with the statement "some scientists believe." This is no scientific evidence at all. You can find "some scientists" who will say they believe almost any proposition you like, even if the established scientific facts are quite the opposite. In the advertising trade (a usually honorable trade that I practiced in my youth), such a statement is known as weasel-wording. Such weasel-wording would draw the ire of the Federal Trade Commission if made on behalf of a deodorant.

The available evidence on species suggests an astonishingly different picture, however.

The proximate source for WWF's forecast is the 1979 book, *The Sinking Ark*, by Norman Myers. Mr. Myers gives these two statistics: the estimated extinction rate of known species between the years 1600 and 1900 was about one every four years. And the estimated rate from 1900 to the present was about one a year. Mr. Myers gives no sources for these two estimates, but let us assume they are valid.

The extinction-rate presented refer only to animals. But there are no data for other species, to my knowledge.

Mr. Myers then departs spectacularly from that modest evidence. He goes on to say that some scientists have "hazarded a guess" that the extinction rate "could now have reached" 100 species per year.*

Next, this pure conjecture about upper limit of present species extinction is increased and used by Mr. Myers and WWF scientist Thomas Lovejoy as the basis for the "projections" quoted in the fundraising letter and elsewhere. Mr. Lovejoy—by converting what was an estimated upper limit into a present best-estimate—says that government inaction is "likely to lead" to the extinction of between 14 and 20 percent of all species before the year 2000. This comes to about 40,000 species lost per year, or about one million from 1980 to 2000.

In brief, this extinction rate is nothing but pure guesswork. The forecast is a thousand times greater than the present—yet it has been published in newspapers and understood as a scientific statement.

Thomas Lovejoy and Norman Myers were at a meeting when I first presented this critique. They found no statistical flaw in it, although they did attack my

* Norman Myers now says that today's rate is "a minimum of 1000, and possibly several thousand, species a year" and that "the extinction rate could surely rise by the year 2000 to an average of 100 species per year" ("Extinction Rates Past and Present," *Bioscience* 39(January 1989):39). This article gives several references for each of these claims, though most are to non-peer-reviewed sources. —Editor.

interpretation, motives, and credentials to discuss biological data.

Simply demonstrating that other peoples' data do not support their conclusion may not be as convincing as presenting independent contradictory data. But apparently there are no other data to be found. The statistical analysis above certainly demonstrates that the WWF warning of an extraordinary rate of species extinction does not follow from the known facts, even the facts presented by WWF itself.

Should this not be enough to discredit their assertion?

Three additional observations are worth keeping in mind. First, there is currently much support for putting samples of endangered species into "banks" which can preserve their genetic possibilities for future generations. Second, genetic recombination techniques now enable biologists to create new variations of species. Finally, it is not easy to extinguish an important species even when we try, as the experience of fighting smallpox and the medfly revealed.

The facts cast the phenomenon of species extinction in a much less frightening light than the WWF picture of fragile valuable species dying off forever with no possibility of replacing or substituting for them.

Reprinted with permission of the author. From Julian Simon, *Population Matters: People, Resources, Environment, and Immigration* (1990, Transaction Publishers), pp. 145-148. Copyright © 1990 by Transaction Publishers, New Brunswick, New Jersey 08903. This selection originally appeared in *The Washington Times*, September 19, 1984. A more detailed analysis is Simon's "Disappearing Species, Deforestation, and Data" which appeared in the May 15, 1986 issue of *New Scientist* and is also reprinted in *Population Matters*, pp. 149-158.

Julian Simon is a professor of business administration at the University of Maryland at College Park. He is the author of The Ultimate Resource (1981) and co-editor with Herman Kahn of The Resourceful Earth (1983).

Book Review

Space-Time Transients and Unusual Events by Michael A. Persinger and Gyslaine F. Lafrenière

1977, Nelson-Hall, 267 pp.

Reviewed by Jim Lippard

Charles Fort and his followers have made a project of collecting scientific anomalies not for the purpose of investigation, but in order to taunt scientists. In the book *Space-Time Transients and Unusual Events* by Michael A. Persinger and Gyslaine F. Lafrenière (P&L), however, collections of Forteana have been put together in an attempt to find correlations between the events and suggest possible explanatory hypotheses. The authors collected 6,060 events from Fort's works and other sources and categorized them with respect to time, space, and category.

The first twelve chapters of the book consist in an introduction and examples of anomalous events from general categories and subcategories. The events are

classified into fall phenomena (e.g., falls of rocks, ice, liquids, animals), electromagnetic-like phenomena (e.g., lights in the air, lights on the ground, reception of radio signals by appliances other than radios), unexplained sonic phenomena (e.g., booms, hums, cracklings, shrieks), UFOs (e.g., in the air, on the ground, abductions), unusual and infrequent astronomical events (e.g., new stars, uncharted objects, solar and lunar peculiarities), unusual and infrequent meteorological events (e.g., extreme weather conditions, ball lightning, sudden temperature and pressure changes, daytime darkness not corresponding to solar eclipses), unusual and infrequent geophysical events (e.g., volcanic eruptions, extraordinary earthquakes, sudden changes in water level, unexplained holes appearing in the ground), unusual and infrequent forces (e.g., appearing and disappearing objects, crying and bleeding icons, spontaneous fires, spontaneous human combustion, "phantom snipers"), unusual or unexplained disappearances (of people, ships, and planes), unusual animals and animal behavior (e.g., Big Foot, lake creatures, animals out of habitat, unusual animal deaths, mutations), and unusual archeological finds (e.g., "impossible" fossils).

The final five chapters contain an analysis of the data and the proposal of several hypotheses. Data on volcanic activity, earthquakes, meteors, and deaths of large numbers of animals due to non-human activity were obtained from the Smithsonian Institution's Center for Short-Lived Phenomena for forty-eight months from 1968 to 1971 and compared with the Fortean data for the same period. Correlations with significance greater than 0.01 (i.e., which would occur by chance 1 time in 100) were found between occurrences within a one-month period of volcanic activity and earthquakes, volcanic activity and unusual weather, volcanic activity and the total of all Fortean events, meteors and animal deaths, UFO sightings and all Fortean events, and unusual animal observations and all Fortean events. To test reliability, the data were split into two portions (1968-1969 and 1970-1971), revealing "similar trends," though with stronger correlations in the earlier interval. P&L come to no particular conclusions regarding these correlations, except to note that the data are "interesting, but not conclusive...[they] must be regarded as significant trends...nothing can be concluded about the mechanism of the events." (p. 179) They also note a significant correlation between frequency of Fortean events and population density, for which they propose (among other possibilities) the interpretation that these events "are persistent artifacts of defective 'instrumentation.' ... the human population can be viewed as a vast network of recorders and measurers that span the earth's surface in varying numbers and densities. By probabilistic demands there are deviant units in this network. ... Such deviant units may be called 'neurotic' or 'untrained observers.'" (pp. 162-163)

An interesting hypothesis proposed in chapter 15 involves solar and geophysical forces. Various extreme weather conditions have been found to be highly correlated with sunspot cycles and solar disturbances.

P&L propose that solar flares, geomagnetic and seismic disturbances of the earth, and so forth may be responsible for luminous displays in the air and on the ground and explain such phenomena as UFO sightings, ghost lights, and unexplained sonic phenomena. They further postulate that geomagnetic effects on the human brain may be responsible for inducing false perceptions. P&L note that a significant correlation exists between the amount of minor earthquake activity in a state and the frequency of unusual events occurring there.

While this hypothesis has some degree of *a priori* plausibility and deserves further investigation, it should be noted that some of the data collected has other mundane explanation. Several of the example cases given in the book are familiar to readers of the *Skeptical Inquirer*. The "ghost lights" of Silver Cliff, Colorado were investigated in Bunch & White (1988a) (but see Fraser & Bohren (1988) and Bunch & White (1988b)). Evidence that the Betty and Barney Hill UFO abduction case and the Charles Hickson and Calvin Parker (Pascagoula, Mississippi) UFO abduction case are hoaxes has been produced by Philip Klass (1987). The hauntings at Borley Rectory (and the "spontaneous fires") appear to have been the productions of "paranormal investigator" Harry Price (Hall 1985). A mechanism by which "spontaneous human combustion" probably occurs has been put forth by Joe Nickell and John Fischer (Nickell & Fischer 1987)—their *SI* article specifically mentions two of the cases listed by P&L. The findings of modern nails and screws in ancient rock is probably due to concretion over these items dropped in crevices in modern times (Cole 1985). Alleged "human footprints" in rock millions of years old have inevitably turned out to be natural formations or dinosaur tracks (Cole, Godfrey, and Schafersman 1985; Godfrey 1985). The 1954 car windshield pits discovered in Seattle turned out to have been there all along—the first reports simply caused people to begin looking at their windshields instead of through them (Medalia & Larsen 1958). Cases of bleeding and weeping icons are probably hoaxes (perhaps using methods similar to the (patent pending?) method of Bay Area Skeptic Shawn Carlson). P&L themselves note regarding the observation of uncharted planets and irregularities on planet surfaces that "There is a conspicuous decrease in events of this type after 1920 ... about this time, a significant increase in measurement sophistication began which allowed marginally visible and borderline phenomena to be properly evaluated." (p. 66)

Clearly, then, correlations between events with these sorts of explanations and other anomalies are most likely coincidental. It would be interesting to see if the correlation between geophysical and solar activity and Fortean anomalies becomes stronger when these events are removed.

The book makes quite interesting reading, and goes fairly quickly because chapters 2 through 12 are composed mostly of lists of anomalies. It is recommended for those interested in Forteana and for a look at some plausible and some implausible hypotheses put forth to explain them. Those wanting to investigate

particular anomalies, however, will not find details in this book and are advised to instead consult the works of Charles Fort and William R. Corliss (see review of his *The Unfathomed Mind*, *AS*, November/December 1991).

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Next Issue

The May/June issue of *The Arizona Skeptic* will feature an account of the mysterious lights of Marfa, Texas and an exchange between self-acclaimed "internationally recognized philosopher" John Bryant and Jim Lippard.

Upcoming Meetings

The Phoenix Skeptics will meet at the Jerry's Restaurant on Rural/Scottsdale Road between McKellips and the river bottom, with lunch at 12:30 on the first Saturday of each month except where it conflicts with a holiday.

Request for Submissions

The Arizona Skeptic is in need of material for future issues. Please send your contributions to the editorial address on page 8. Meeting reviews in particular are desired.

Articles of Note

Jacob Cohen, "Conspiracy Fever," *Commentary* 60(4, October 1975):33-42. An old article about the JFK assassination which deserves to be resurrected.

Shows how the evidence of JFK's wounds does *not* support the claim that there was an assassin in front or to the right. (Philip Klass and Lawrence Kusche are briefly mentioned in footnotes about UFOs and the Bermuda Triangle, respectively.)

Patrick E. Cole, "Who Killed J.F.K.?" *Time*, December 23, 1991, pp. 66-70. Another look at Oliver Stone's film and the plausibility of some of its allegations.

Mike Dash, "Satanic Ritual Abuse in Epping?" *Fortean Times* #61(February-March 1992):34-35. A followup on an alleged satanic child abuse case reported in *FT* #57 (see "Articles of Note," *AS*, November/December 1991). The first British case to go to trial ended with the main witnesses for the prosecution discredited. (This issue of *FT* also has some letters on this subject.)

Jim Erickson, "Biospherians Began with 3-Month Food Supply," *Arizona Daily Star*, January 5, 1992, pp. A1-A2. Reveals that the Biosphere 2 began with supplies of food for the humans and animals, and that crew member Jane Poynter brought some supplies back into the bubble on October 11 after leaving for surgery after slicing off the tip of her finger in a rice-threshing machine.

"Managers of Biosphere Project Are Accused of Compromising Experiment," *New York Times*, January 26, 1992. Reports on accusations by filmmaker Louis Hawthorne, who was hired last year by the University of Phoenix to make an educational film/documentary about the Biosphere 2, that Biospherian Poynter took airlock tamper indicators with her into the B2 after her accident and that the B2's software has been designed so as to allow editing of the data. Hawthorne is being sued by Space Biospheres Ventures and the University of Phoenix.

Mary Lefkowitz, "Not Out of Africa," *The New Republic* 206(February 10, 1992):29-36. Debunking of some Afrocentric claims that the ancient Greeks stole everything from Egypt; a book review of six books which hold Afrocentric views. (Also see the exchange between Martin Bernal and Lefkowitz which took place as a result of this article in *The New Republic* 206(March 9, 1992):4-5.)

Alan Lightman and Owen Gingerich, "When Do Anomalies Begin?" *Science* 255(February 7, 1992):690-695. The authors maintain that "scientific anomalies are recognized as anomalies only after they are given compelling explanations within a new conceptual framework," prior to which time they are either "taken as givens or ignored." Examples adduced in favor of this hypothesis in the course of the article include the flatness of the universe, which became important with Alan Guth's inflationary universe model; perigee opposition in retrograde motion, taken as a given under Ptolemaic astronomy but explained under the Copernican model; continental fit explained by continental drift; adaptation of organisms to their environment

explained by evolution; and equality of inertial and gravitational mass, explained by Einstein.

Jim Lippard, "How Not to Argue with Creationists," *Creation/Evolution* XXIX(vol. 11, no. 2, Winter 1991-1992):9-21. A description of bad tactics used by some Australian critics of creationism.

Ivars Peterson, "Off the Beat: Euclid's Crop Circles," *Science News* 141(February 1, 1992):76-77. A report on how retired astronomer Gerald Hawkins (known for his studies of Stonehenge) claims to have found five geometrical theorems represented in crop circles which are not to be found in the works of Euclid. Four of the five are revealed, the fifth kept secret as a "test" for hoaxers. But surely the geometry of crop circles can exhibit interesting geometrical properties without having been designed to exhibit them. Hawkins' work here is somewhat reminiscent of the "pyramid inch" concept.

Denis L. Rousseau, "Case Studies in Pathological Science: How the Loss of Objectivity Led to False Conclusions in Studies of Polywater, Infinite Dilution and Cold Fusion," *American Scientist* 80(January-February 1992):54-63. Rousseau, whose investigations of polywater were a major factor in its demise, simplifies Irving Langmuir's criteria of "pathological science" into three conditions, which he illustrates with examples from the polywater controversy, Benveniste's pro-homeopathy dilution experiments, and the cold fusion controversy.

Rocky L. Stewart, "Bubble Trouble," *Harper's* 284(February 1992):29-30. Resignation letter from the Biosphere 2's senior software engineer, who cites false information being given by project administrators to the press as one of his reasons for quitting.

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