

letters

of factors will be acting at that time; we make no claim that large earthquakes in general, or movement on the San Andreas in particular, is exclusively driven by any solar effect. The data we quote¹ suggest that solar activity may contribute a small push, and our hypothesis is that part of the San Andreas is now in such a state of strain that even that small push may suffice to trigger movement.² Meeus also quotes his recent comments in *Icarus*, but neglects to mention our response to these.³

References

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Case against UFO's

I think it would be a great mistake for PHYSICS TODAY to start publishing material concerning UFO phenomena. A small group of avid ufologists are endeavoring, unsuccessfully I hope, to promote financial support for research in the field.

The dedicated ufologists naturally resent the conclusion reached by the late Edward U. Condon, who directed the Air Force Commission study of UFO's at the University of Colorado. His conclusion that "UFO's are a dead-end street, a waste of time," deserves the support of scientists, not the ridicule it has generally received from the "believers."

I am one of the few individuals who has had wide access to the officially recorded sightings in the Air Force files. Although ufologists are quick to admit that most UFO reports have relatively simple explanations in terms of known phenomena, they like to stress the fact that some six percent of the sightings were not identified. The implication is that, somewhere among those unsolved cases, will be found the *truth*, namely that UFO's are a form of spaceship from other planets somewhere in the universe.

Condon was completely correct when he stated that "all non-explained sightings are from poor observers." The records of these sightings, many of which I have been privileged to examine, frequently do not contain information about the date, time, location and direction of the UFO. Compounding the error is the fact that the Air Force questionnaire was itself so poorly worded that an honest observer often inadvertently gave the wrong answer. One of the most frequent sources of such error lay in the question: "In what direction was the UFO moving?" Many observers, especially military and

commercial pilots, innocently reported what the apparent direction seemed to them, had they been the pilot of the UFO. Add to these the numerous and almost undetectable hoaxes, and one sees the impossibility of ever hoping to resolve the hundreds of unidentified sightings.

I realize that there are a few scientists who hope that some remarkable, hitherto unsuspected scientific phenomenon lies at the base of the unexplained cases. It is this hope that keeps alive a modicum of interest in current reports. But one would think that more than 25 years of study during the current UFO flap, with mysterious apparitions in the sky extending all the way back through the centuries to biblical times, that by now one would have an inkling as to what is really going on.

And even today how many scientists are inclined to accept the foolish logic of von Däniken, who argued, for example, that the famous vision of Ezekiel, with the "wheel within a wheel" was the arrival of a sacred chariot bearing Gods from outer space! The phenomenon as vividly described in chapters 1 and 10 of the Scriptures does have a simple, purely scientific explanation. A layer of ice crystals floating in extremely quiet air can produce a double ring of light centered on the Sun, with a vertical cross, looking like spokes of a wheel, that rises up in the sky with the Sun but does not turn. The whole thing looks like a huge celestial chariot, but there is no scientific mystery about the phenomenon, rare as it is. But in the hands of an imaginative individual, not familiar with meteorological optics, parhelia, sundogs and related apparitions can be mysterious and often frightening.

This is just one aspect of ufology. For hundreds of different causes lie behind the optical phenomena known as flying saucers or UFO's, completely mysterious to the uninitiated individual.

Meteorological optics and many other such phenomena are truly physical in nature and, if something new is evident, they deserve a place in PHYSICS TODAY. But the slur cast on that great scientist, Condon, by Harold Heaton, in a recent letter (February 1975, page 11), who said that the report is "grossly inaccurate," clearly represents the unqualified but popular position adopted by most ufologists.

Heaton further drags the red herring of "constant ridicule" of those who claim to have seen a UFO. This is also nonsense! UFO's are there to be seen by anybody who takes the time to look for them. Fortunately, most people recognize them for what they are. Equally wrong is Heaton's statement that "the history of UFO investigations has been one of character assassinations and belittlement." This statement is another part of ufological doctrine, disseminated with the objective of accomplishing just the reverse, of stifling critical, scientific studies

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letters

such as those made by Condon and myself.

From time to time, newspapers carry stories headlined about as follows: "UFO's Gaining More Attention Among Scientists." The story may sound convincing, except when one reads the names of the individuals promoting the idea or participating in some scientific conference, one will find that the propaganda originates again and again from the same group of dedicated ufologists, trying to drum up financial support for their investigations.

Let us keep PHYSICS TODAY for science and not for mysticism. If we are to open its columns to ufology, why not to astrology, a current fad even more popular than UFO's in their day? What about alchemy? The N-rays, the Allison Effect, Mitogenetic Radiation, and hundreds of other once popular fads? The phenomenon of the UFO is not "baffling," except to those whose wish to believe in the reality of the phenomenon amounts almost to a religious mania.

If this note appears in "Letters," I predict that "Party Liners" will send vigorous protests, perhaps citing the notorious boo-boo of the French Academy in 1790, when they refused to recognize the cosmic origin of meteorites—a decision they reversed only 13 years later. I most certainly do not wish to hinder legitimate scientific inquiry. But I see nothing in UFO's that merits the continuing support—moral or financial—eagerly sought by the ufological fraternity. For reliable information on the subject, I commend the recent book, *UFO's Explained*, by Philip J. Klass, published by Random House.

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THE AUTHOR COMMENTS: It is unfortunate that Donald Menzel chooses to promulgate the view that UFO's are only dealt with by a small, clandestine group of "avid ufologists" and "believers." It is precisely the attitude that PHYSICS TODAY should refrain from publishing UFO material that has relegated such reports to folklore and the popular press. Without opportunity for the exchange of information in which some confidence may be taken, half truths and cultists flourish.

If there is something in UFO reports worth studying, why has nothing surfaced over the past 28 years?

In 1955, the Air Force released a study¹ of the reports received between June 1947 and December 1952. Contained within, figure 8 shows the "Distribution of Object Sightings by Sighting Reliability Groups with Evaluation Distributions for Each Group," based upon 2199 cases selected

from the approximately 4000 initial reports. Of the 2199 reports, the panel deemed 213 (9.7%) as *excellent* sightings, 757 (34.5%) as *good*, 794 (36%) as *doubtful* and 435 (19.8%) as *poor* sightings. Each reliability group was further analyzed to determine what fraction could be explained, for example, astronomically or as balloons. The findings were remarkable.

Of the 213 excellent sightings, 33.3% remained unidentified after evaluation. Similarly, 24.8% of the good reports remained unknown, while only 16.6% of the poor and 13% of the doubtful sightings were unexplained. In other words, the more reliable the sighting, the more unlikely that the object could be identified! One quarter to one third of the best sightings remained a mystery. And good and excellent sightings comprised nearly *one-half* of the total number evaluated during that period.

However, there was not any follow up. Nowhere in the text was this figure even discussed. The study merely concluded that "a critical examination of the figures will show that no trends, patterns or correlations are to be found..." Criteria for reliability estimates are not mentioned. The summary released to the press did not discuss that analysis. Rather, it mentioned that since 1954, better investigation had reduced the ratio of the *total* number of unidentifieds to the total number of sightings to 3% (it quoted 9% as the figure for 1953 to 1954). We must conclude that either the number of "unidentifieds" had actually been high but decreased or that more sightings were now being vectored into the category "insufficient information." The above trend was simply ignored.

Others, beside Menzel, had access to official UFO files. Edward Ruppelt, Director of Project Blue Book from 1951 to 1953, writes² "to one who is intimately familiar with UFO history it is clear that Project Grudge (the second USAF project, 1949 to 1951) had a two-phase program of UFO annihilation. The first phase consisted of explaining *every* [italics added] UFO report. The second phase was to tell the public how the Air Force had solved all the sightings. This, Project Grudge reasoned, would put an end to UFO reports." Ruppelt goes on to quote an Air Force colonel, whom he describes as directing the UFO project in 1950, as saying "it's all a bunch of damned nonsense... there's no such thing as a flying saucer." The colonel felt that "all people who saw flying saucers were jokers, crackpots or publicity hounds." Pilots who saw UFO's "were just fatigued" (see pages 84 and 108-112). Most reports indicate otherwise.

This type of bias cannot precipitate a strong, impartial examination of whatever facts have accrued. It indicates a surprising attitude for an investigative body. I chose to criticize Condon for similar ut-

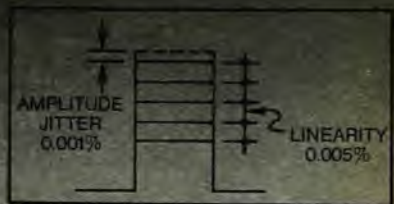
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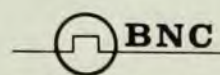


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terances, although Menzel exhibits lack of attention to detail when he states that "the report [*italics added*] is grossly inaccurate" were my words. That observers were ridiculed is called "nonsense" by Menzel, yet it is dictated by such attitudes as those related by Ruppelt.

For example, Ruppelt says that commercial airline pilots were so sensitive to ridicule that one commented, "if I saw a flying saucer flying wing-tip formation with me . . . even if my whole load of passengers saw it—I wouldn't report it to the Air Force."

This attitude is underscored by comparing the description on pages 11-14 of J. G. Fuller's book³ of a large ground-level red object seen by four independent witnesses with the initial Air Force explanation that appears therein on pages 201-203. The Condon report⁴ did not even give this case attention. Ridicule and belittlement of observers are not "red herrings." Compare the discussion in reference 5 of Case CEI-9 involving three police cruisers that independently observed an UFO to Menzel's contention that character assassination does not occur.

The Air Force was charged with the air defense of the United States. When it became apparent that UFO's posed no threat to our country, I believe that they would have preferred to rid themselves of the burden of investigating them. Results that did surface, such as figure 8 of Special Report 14, were contrary to official expectations and were mishandled.

Sociologist Robert Hall recently discussed the dangers inherent in blanket reassurances to the public about UFO's, (reference 76, page 106) such as demonstrated by the Air Force. In his concluding remarks, Hall says "that hysteria . . . can account for some of the reports, but there is strong evidence that there is some physical phenomenon underlying a portion . . . Because of the lack of trustworthy information . . . systems of conflicting belief have been built up to account for a very ambiguous set of circumstances." He continues "each of these positions is sometimes defended beyond the point of rationality." This is reflected in Menzel's comment that my February 1975 letter seeks to stifle his and Condon's past scientific studies.

"We clearly have . . . a problem," Hall continues, "of subduing irrational system of belief, . . . of lowering the anxiety about these reports and of reducing the ambiguity about their nature . . . Clearly the antidote is simple. It is to get good, reliable information which people have confidence in" (page 104). This will not occur in the popular press.

If scientific information is not given to this subject, this simply will never happen. Another 28 years of vague debate will ensue.

UFO's may afford little chance of contact with other life forms, as Carl Sagan has said, but their puzzling nature merits attention. The ideas of Von Daniken are an aberration, which should no more restrict our attention to UFO's than astrology impedes astronomy. But they are not an aberration because he suggests that Earth was visited in the past by space-ships. If we argue that way, we are provincial. They are a quirk because they are based largely on inaccurate inferences. He denigrates scientists and jumps to unjustified conclusions. If our egos were not at stake, if prior belief were not so strongly dominant in such matters, he would be innocuous.

"Scientists are no respecters of authority," Condon writes.⁴ "Our conclusion that study of UFO reports is not likely to advance science will not be uncritically accepted by them. Nor should it be, nor do we wish it to be. . . . If they do get (new) ideas and can formulate them clearly, we have no doubt that support will be forthcoming to carry on with such clearly defined studies" (page 2).

These ideas are apparently unshared by Menzel, who finds it important enough to twice assail any UFO funding. Condon concludes his statement above, with clearly defined studies in mind, by saying, "we think such studies *should* be supported [*italics added*]."

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I would like to congratulate Harold Heaton for having written his letter "Investigating UFO's" (February 1975, page 11), and I hope that your journal will consider, in the future, this topic far more seriously in presenting evaluations on UFO's by scientists who took the initiative to study them, while lots of others simply scoffed.

Unhappily, it seems that this puzzling subject is still a sort of taboo in the scientific community and, in my opinion,

this unusual psychological reaction to the simple word "UFO" would also be worth studying by psychologists and other social scientists!

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The question of why scientists generally will not investigate UFO phenomena has at least one good answer, unrelated to "scientific peer-group pressure" (letter of Harold I. Heaton, February 1975). We simply do not like to work with those who are true-believers in the phenomena, because any scientific skepticism we have, or impartially drawn conclusions, are met with another explanation or justification for the existence of the UFO's, rather than with a rational examination of the conclusions on the basis of the observable facts. I don't claim non-believers are unbiased, but most retain some sense of balance.

To illustrate, I was asked to examine a metal sample of about 1/2 kilogram mass, said to have been left behind after a UFO landing. It was further said to be of a composition totally unknown on Earth, unidentifiable by a metallurgist, to include a large quantity of gold in its composition, to have a hardness second only to diamond, and to have been fabricated and finished in a manner unknown to us on Earth. It was also said to have certain structural damage features, on which I am not competent to comment. I enlisted the help of experts: the Principal Mechanicians in our shop agreed that the metal was cast and finished off crudely but smoothly on a belt sander. It appeared to be crystalline in structure. The analytical chemist whom I asked to make a preliminary survey of its chemical content to see if it was worth examining in detail, George Shalimoff, made the following report: "specific gravity $15.4 \pm 10\%$; magnetic; no alpha, beta, or gamma radioactivity; 80-90% tungsten, 10% cobalt, 0.5% chromium, 1% iron, traces of manganese and silicon, no gold or 31 other commonly found elements; very similar to tungsten carbide; looks like a carbide alloy, exotic but not mysterious." The specific gravity of carballoy is about 14, that of tungsten 19. Upon return of the sample, the owner said, "The analysis certainly confirms that the material is extraterrestrial." The next report which I saw, made by a newspaper's "Blue-ribbon UFO panel," of which the sample owner is a member, said, ". . . better than even chance that the material is extraterrestrial . . . its density is certainly unusual . . . this material would be very difficult to duplicate. It would require a highly sophisticated and complicated process at high temperatures." The sample owner is a man of integrity so far as I know; he is an eminent engineer, yet in my opinion he throws away his judg-

ment when he discusses UFO's. This is what makes it difficult for me to talk seriously with those who have seen UFO's, or study UFO phenomena.

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Male chauvinism

The American Institute of Physics is to be commended for taking a giant, albeit long overdue, step to end discrimination against women in physics by adopting the term "chairperson" in lieu of "chairman." It is then with regret that we note a residue of male chauvinism in some circles, as is evident from the names of an otherwise distinguished group of particle physicists: Feynman, Gellman, Neeman, and Gottsman. Even worse, it is known that there is a strong particle-physics group (largely male) at the Weizman Institute.

In this connection we should also be on our guard against discriminatory tendencies in common English words, for example, population. Fortunately in this case there is an obvious emendation—use "POPulation" for a group of males, "MOMulation" for a group of females, and simply "ulation" for a mixed group. Other cases, such as misfortune, mishap and misinformation, are not so easily disposed of. It is to be hoped that such matters will be given priority attention by the Committee on Physics and Society.

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More pollution hazards

In his letter (December 1975, page 9) on the hazards of air pollution from coal-fired power plants Joseph Devaney did not mention the release to the air of natural radioactivity by fossil-fueled power plants. A paper by Z. Jaworowski, et al, ("Environmental Surveillance Around Nuclear Installations," Vol. I, page 403, International Atomic Agency, Vienna, 1974) indicates that the dispersion of natural radioactivity by fossil-fueled power plants is likely to be much higher than the release of artificial radioactivity from nuclear power stations.

Jaworowski has calculated that the dose rate 15 km from the fossil-fueled Siekierki plant near Warsaw is 0.11 mrem/year per megawatt of electric power. For comparison he quotes a dose rate of 10^{-7} mrem/year per MW(e) at the site boundary of the Dresden I reactor and a dose rate of 2×10^{-4} mrem/year per MW(e) at the site boundary of the Yankee reactor at Rowe, Mass. From these figures one might conclude that reactors emit between five hundred and one million times less radioactivity than fossil fuels producing the same amount of electricity.

(continued on page 78)