

letters

an attempt to use a *bona fide* international scientific activity as an instrument in the political conflict. It was thus at variance with the very principle that provides the basis for the criticism of the developments in UNESCO.

In many respects the International Council of Scientific Unions (ICSU) and its affiliated Unions such as IUPAP are in a similar situation. They are non-governmental organizations affiliated with UNESCO. The International Unions like the Trieste Centre have been able to withstand discriminatory pressures and are endeavoring to uphold the traditions of international cooperation in science without regard to political considerations. We feel it of the greatest importance to support the Unions as well as the Trieste Centre in their efforts to preserve these traditions.

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Sunspots and earthquakes

In October 1975 (page 13) John Gribbin writes in a letter that the "major tremors" in the early 1800's are clearly of interest to his hypothesis. However, actually *each year* there are several big earthquakes in the world, so one ever can consider some of them in favor of any theory or hypothesis, and "prove" just what one desires to be proven.

Contrarily to Gribbin's statement, *no* more seismic activity is likely at times of maximum solar activity. In fact, observation shows that *there is no relation between the solar activity and the number of big earthquakes*. For exam-

ple, there were 31 earthquakes of magnitude 7.0 or greater in 1944, the year of a sunspot minimum (mean sunspot number $N = 9.6$), while there were only 25 in 1947, a year of high sunspot maximum ($N = 151.6$).

The figure shows the number E of earthquakes of magnitude 7.0 and greater, and the annual mean of the Zurich sunspot numbers N , for each year from 1905 to 1964. The numbers of earthquakes have been taken from the list of S. J. Duda.¹ There is clearly no relation between solar activity and the number of earthquakes. In fact, a least-squares solution gives the relation $E = 18.81 + 0.0188N$. The coefficient is very small, and because of the enormous scatter of the individual values one may say with confidence that for all practical purposes and for theoretical interpretations this coefficient is *zero*. Graphically we obtain a straight line that is practically horizontal (colored in the figure).

For the same values of E and N , the correlation coefficient is as small as 0.129, indicating that there is no relation between E and N .

Finally, while it is true that "buildings should be constructed to resist great earthquakes," the encouragement of this attitude may be no excuse for writing nonsense.

Reference

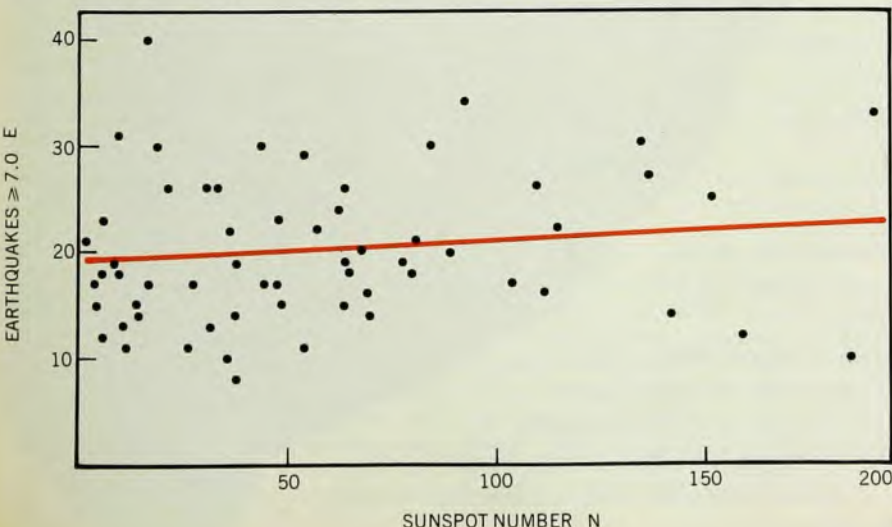
1. S. J. Duda, *Technophysics* 2, 427-452 (1965).

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THE AUTHOR COMMENTS: The data Jean Meeus has gathered are valuable in their own right, but have no relevance to our book *The Jupiter Effect*. The point of our exercise is drawing attention to the likelihood of movement on the San Andreas in the near future is that an essentially unique combination



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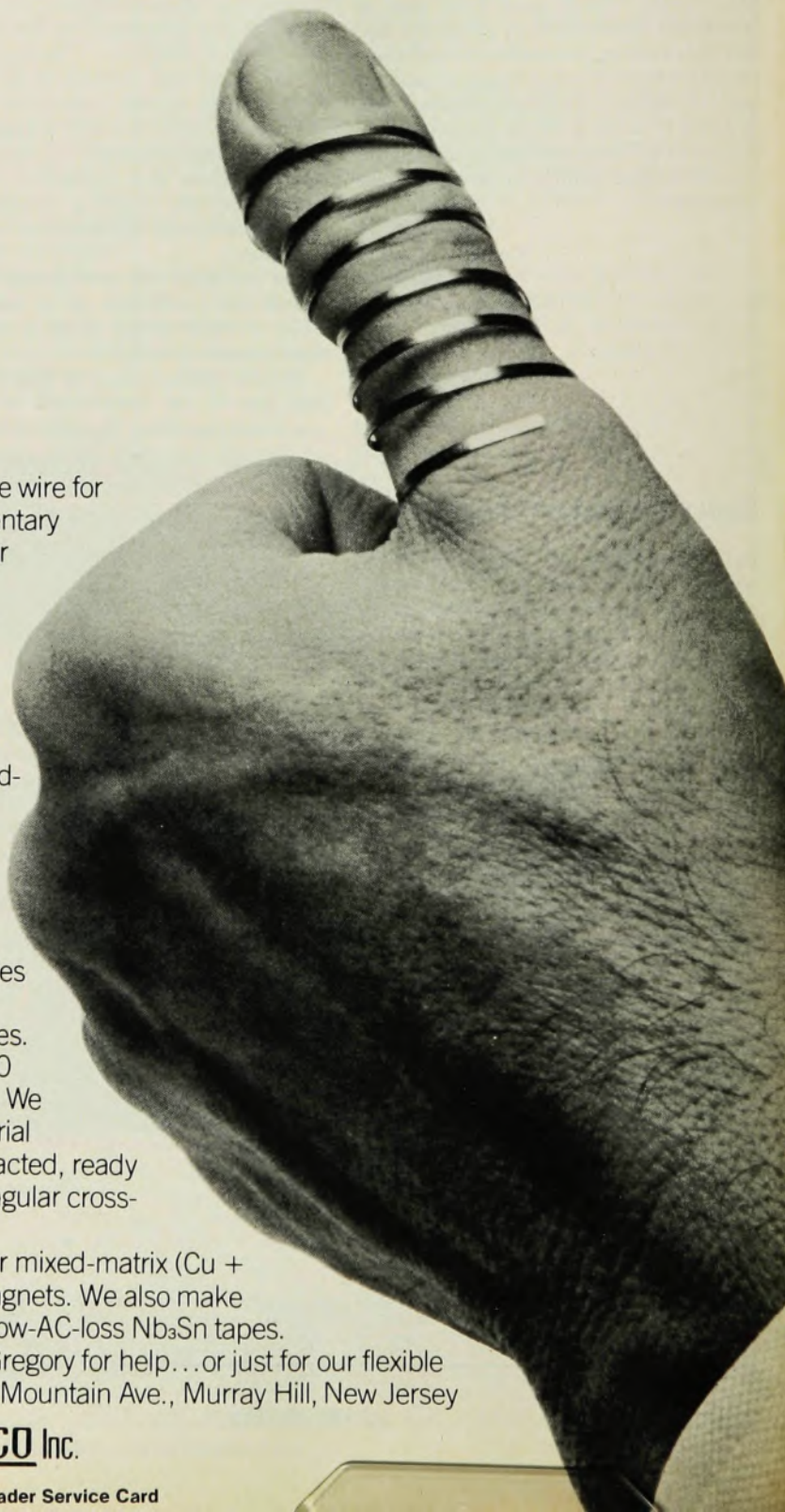
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letters

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

1. J. Gribbin, S. Plagemann, *The Jupiter Effect*, Vintage, Brighton, UK (1975).
2. J. Gribbin, *Science* 173, 558 (1971).
3. J. Gribbin, S. Plagemann, *Icarus* 26, 268 (1975).

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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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