

Title: ***Solar Storms ~ 2000 Years of Human Calamity!***

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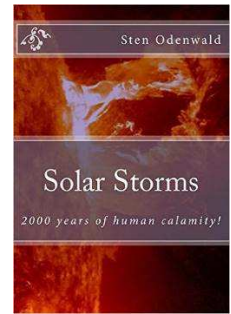
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Reviewer: Whitham D. Reeve



Upon reading this book's hyperbolic title my first thought was the author must have worked for the USA Today "newspaper" but apparently not. ***Solar Storms ~ 2000 Years of Human Calamity!*** is an author-published book, something more and more common today. Unfortunately, it suffers from lack of editing. The book amounts to a compilation of isolated incidents over the last couple hundred years that, according to the author, add up to a "human calamity". The book's subtitle mentions 2000 years but the included reports of events prior to printed media are thin and superficial. It is not at all clear that there was a space-weather-caused "human calamity" prior to the telegraph and printed media. In that context, a compilation of just about anything involving humans over any time period could be considered by some people a *calamity*. So, what is all the fuss about?

The book is mostly based on newspaper accounts, and consists of eight chapters and an epilog. The chapters all have the same theme: 1 – *Solar Storms, the Stuff of Legends*; 2 – *Solar Storms in the Modern Era*; 3 – *The 1859 Superstorm*; 4 – *Other Storms in the 1800s*; 5 – *The 20<sup>th</sup> Century Storms*; 6 – *The Space Age Storms*; 7 – *The Satellite Era*; 8 – *They Call It Space Weather*. Both color and black-white illustrations are used in the book but they are sparse and usually not tied directly to the text. A significant flaw in the book is that multiple accounts of the same event are taken from different newspapers that, like today, are copied from some original source. Consequently, many entries are repeated not twice but three or more times almost word-for-word. The book would be about 2/3 the present size if those were cleaned out. The author undoubtedly researched a lot of newspaper and popular accounts for this book but the scientific backup is comparatively quite sparse.

***Solar Storms ~ 2000 Years of Human Calamity!*** makes it abundantly clear to anyone with more than a microgram of common sense that today's hysterical news media has a clearly traceable ancestry of sensationalistic, made-up and embellished news. It is remarkable how seldom popular news articles accurately describe facts that are readily obtained by simple inquiry. Today, "fake" news is condemned by the self-righteous media as if it is practiced by someone else and not them. Extrapolation of today's news media environment easily leads one to question the accuracy of news reporting from more than 100 years ago. Of course, I am talking about "consumer" news media and not so much about scientific reporting but it is an unfortunate truth that even science authors and editors sometimes fail to be objective.

The problems of hysterical, over-blown news reporting are not the author's fault, of course, but he waits until the last chapter and *Epilog* to comment on these systemic journalistic problems. It would have been much better to place an explanation at the very front of the book as a kind of warning to readers. At least the author recognizes there are obvious tendencies of media organizations to spend more time and space reporting on so-called celebrities than anything else. He says "...considering that there are far more technological connections to space weather conditions today than there were 50 year ago, it is puzzling that the "Golden Years" of space

*weather reportage has indeed passed, and the mediocre reporting of today is almost universally considered normal”.*

From ***Solar Storms ~ 2000 Years of Human Calamity!*** we learn that in the days of the wireline telegraph, a number of stations experienced problems coincidentally with solar activity and geomagnetic storms. These included large “ground currents” – expressed as voltages in the news reports – exceeding several hundred volts and being sufficient to operate a telegraph station without its batteries. In some cases, apparatus caught fire or was damaged by the high voltages and currents. Some of these events may have been related to lightning activity but, of course, lightning is not mysterious enough to report as a cause. Regardless of underlying cause, these events could have been made worse by limitations in over-voltage and over-current protective devices of the day. In any case, there were no reports of injuries, but the newspaper accounts of the time made it sound like the world was ending. Sound familiar?

The introduction of radio-telegraph and radio-telephone systems did not alleviate problems apparently caused by space weather. Radio blackouts were common – as they are today – particularly in the high frequency band during solar cycle maximum periods. Radio blackouts generally are less of a problem to entities that have backup communications systems but can be a problem nonetheless.

As different communications technologies became important, they occasionally failed due to space weather – the technologies themselves did not fail but specific installations that used those technologies did. Spacecraft are especially vulnerable but they have been made less so by design experience and advances in understanding failure causes. I have studied the statistics of communications system failures since the early 1970s, and I can say without hesitation that the elapsed times and costs involved in system outages caused by human errors greatly exceed anything caused by space weather. And one does not need to cherry-pick the time or date as is done in many statistical studies.

Of course, a contractor accidentally digging up a fiber optic backbone cable with a backhoe is never reported by the news media as a doomsday scenario like a telegraph key mysteriously catching fire or a mysterious satellite failure. The difference is, the contractor’s error is not seen by the news media as a scary event that can be whipped into a mystery of science beyond human control or, better yet, a government conspiracy and then told with blaring headlines “We’re all gonna die!”

As electrical supply systems expanded, long distance power transmission lines occasionally experienced problems during geomagnetic storms that resulted in power transformer damage. It is interesting that there are many stories of this problem but they all point to the same event and show pictures of the same burned out power transformer. The problems of power transmission systems failures brought on by space weather likely could be solved by better design of protective relaying systems and through operator training but these facets of system operation are rarely mentioned in media reports of such failures. And, it is not just powerlines that might be better protected from space weather by better design. Of course, this is an engineering problem and not a science research problem, thus no grants and other government funds need be involved.

And so it goes. The reports of calamity described in ***Solar Storms ~ 2000 Years of Human Calamity!*** give the impression that human existence is not only on the brink of destruction but already may have been there. As more advanced technologies are deployed, the problems caused by space weather will only get worse, or so we

are told. OMG, my Facebook is down! What, Twitter and QQ are down too? OMG, I don't think I'll make it! In conclusion, old newspaper accounts make up the bulk of this book and it shows how little the news media has changed over the years. There is no question that space weather can cause failures in electronic and electrical systems but the last place we should learn about them is from the news media.



**Reviewer** - Whitham Reeve is a contributing editor for the SARA journal, Radio Astronomy. He obtained B.S. and M.S. degrees in Electrical Engineering at University of Alaska Fairbanks, USA. He worked as an engineer and engineering firm owner/operator in the airline and telecommunications industries for more than 40 years and now manufactures electronic equipment for use in radio astronomy. He has lived in Anchorage, Alaska his entire life. Email contact: [whitreeve\(at\)gmail.com](mailto:whitreeve(at)gmail.com)