

COMMENT

Apocalypse now?

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And I beheld when he had opened the sixth seal, and, lo, there was a great earthquake; and the sun became black as sackcloth of hair, and the moon became as blood.

Revelation 6:12 (King James Version)

Every religion has a myth about the end of the world. My personal favorite is Ragnarök, the end-time of the old Norse mythology. Three terrible winters, with no summer in between, will occur in succession, and then a great wolf will devour the sun, and his brother will eat the moon, bringing darkness to the earth. The inhabitants of hell, with Loki at their head, will join with the giants to attack the gods. Heimdallr, guardian of Bifrost, the rainbow bridge to Asgard, will sound his horn and call the gods to battle. On the battlefield, he and Loki, mortal enemies since the beginning of time, will kill each other. Finally, after Odin and Thor have been killed, the fire giant Surt will incinerate the universe. The myth goes on to predict that a new world will arise after this, with the rebirth of the gods, who will live in harmony with men. (That doesn't sound so bad, does it? Except for that incineration-of-the-universe part. That sounds bad.)

Note that in this story, just as in the verse from *Revelation*, there are specific signs that indicate the end is near. That is a common feature of nearly every apocalyptic myth. These signs are occasionally good things, but most often are bad things - typically so unusual, or so terrible, that they can only be comprehended as portending the obliteration of everything. Christians, in particular, have been watching for such signs since the first century AD, because early Christianity was very much an eschatological faith, and most of its adherents were convinced that the Second Coming was imminent. (Some modern evangelical Christians believe the same thing, which can lead them to ignore problems like global warming on the grounds that the world will end before such problems become serious. Unfortunately, their numbers included a few policy makers in the recent Bush administration.)

Most Hindus believe that we are living in the Kali Yuga, the last of the four periods that make up the current age. According to this belief, each period has seen a successive degeneration in the morals and character of human beings, to the point that now, in the Kali Yuga, conflicts and hypocrisy are prevalent. (Sounds a bit like the Republican presidential debates, doesn't it?) This is taken as a sign that soon Shiva will dissolve the world. (I think we can all agree: dissolving the world would be bad.)

In Islamic tradition, the Prophet Muhammad listed a number of signs of the apocalypse, including this one: "When the most wicked member of a tribe becomes its ruler, and the most worthless member of a community becomes its leader, and a man is respected through fear of the evil he may do, and leadership is given to people who are unworthy of it, expect the Day of Judgment." (I suspect that, no matter what country you live in and who's in charge, these signs may sound worryingly familiar.)

And then, of course, there's the alarming 'fact' that the Mayan calendar is scheduled to run out on 21 December 2012. According to *Wikipedia* (reliance on which, by students and columnists, may be another sign of the apocalypse), this date is regarded as the end-date of a 5,125-year-long cycle. Various astronomical alignments and numerological formulae have been proposed as pertaining to this date, though none have been accepted by mainstream scholars (which means anyone with half a brain). An entire movie, the disaster film *2012*, was based on the idea that the world will end this year. (By 'disaster film,' I mean a film about disasters, not a film that is itself a disaster, although in this case both are applicable.) Mexican tourist industry officials are actually planning to exploit the idea as a way of encouraging visits to Mayan ruins. A recent burst of solar flare activity, which can damage some communications satellites and electronic devices, is taken by some as further evidence that a cosmic catastrophe is imminent. I'm told, however, that this whole notion is actually based on a mistake, and that scholars of ancient Mayan culture insist there is no specific 'end' to the calendar. (Of course, since there haven't been any ancient Mayans around for at least a thousand years, there's no one to ask about this who would really know. So, just in case, I intend to send my Christmas presents out early this year, and I suggest you do the same.)

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The disturbing thing about many of these so-called apocalyptic signs is that they can be viewed as already having taken place, which would mean that the clock is ticking, and the alarm is set to go off soon. In that spirit, I thought I would share with you a few of my own favorite recent signs of the apocalypse. Some are taken from science, including the world of genomics. Others are just taken from the world around us.

1) The *Financial Times* reported last year that the price of stock in Berkshire Hathaway, Warren Buffet's company, jumps every time the actress Anne Hathaway gets a lot of media play. According to the *FT*, this is due to so-called robotrading algorithms, automatic stock-trading computer programs that now account for about 70% of all stock transactions. Evidently some computer genius programmed these algorithms to track trends in news coverage, but forgot to tell them how to distinguish between a company with over \$380 billion in assets and an actress with quite different, albeit equally impressive, assets.

2) Speaking of women, *Sports Illustrated* magazine, which has reported a Sign of the Apocalypse weekly for years, provides this one in the 30 January 2012 issue: "Corner Canyon High, a new school set to open in Draper, Utah, in 2013, had its request for a team nickname, the Cougars (the No. 1 choice in a poll of future students), rejected by the school board on the grounds that it would be offensive to some middle-aged women." I presume this means that the University of Notre Dame football team, whose nickname is the Fighting Irish, may soon be asked to change it to something like the Fighting Sparrows. Or would that be considered offensive to birds?

3) The social media site *Facebook* has over 850 million users - that's more users than the total population of the United States, Indonesia and Brazil, put together. At present rate of growth, by 2013, if *Facebook* were a country, it would be China.

Imagine what that statistic means: by next year, roughly one in every seven people on the planet will be a *Facebook* user. And of those 1,000,000,000 *Facebook* pages, 999,999,999 will still be mind-numbingly boring. By the way, *Facebook* is planning to make an Initial Public Offering (IPO, in Wall Street jargon) of its stock. Analysts - en masse, possibly the dumbest creatures on earth - estimate it will be valued at \$100 billion. That would be 100 times its earnings, when the average company is trading at 12 times earnings. It should be noted that Apple and Microsoft also had IPOs with staggering multiples (Apple's was at slightly over 100 times earnings). But then, Apple and Microsoft actually make things that people buy.

4) Speaking of social media, according to a recent *USA Today* article, "a growing number of theaters and performing groups across the country are setting aside

'tweet seats,' in-house seats for patrons to live-tweet during performances. Jumping on this most dubious of bandwagons are, among others, the Carolina Ballet in Raleigh, NC, and the Dayton Opera in Dayton, Ohio. Rick Dildine, the executive director for Shakespeare Festival St. Louis - an outdoor theater festival that began using tweet seats two years ago - said tweet seats have 'become a national trend!'

5) A number of scientists have proposed that we should sequence the genome of every species of organism on the planet. Of course, no one knows how many there are (the current count of known species is around 2 million), but estimates range up to 100 million. If we assume an average cost per genome of \$1,000 for a good quality sequence, such a project could cost up to \$100 billion, which, by coincidence (or is it a coincidence?) is the probable value of the *Facebook* IPO. By the way, you get one guess who those scientists are. That's right, they're genome sequencers. I guess when what you do is assembly-line science, you have to find ever more creative ways to stay in business. My other guess is that we would get a much better return on the investment if we just took the \$100 billion and bought out all the shares of *Facebook*.

6) 41% of Americans believe Jesus Christ will return by the year 2050. Since more than 32 million Americans will be over 80 years of age by then, He should feel right at home, as He will be well past His 2000th birthday.

7) Speaking of old age, President Obama has announced a War on Alzheimer's Disease. He intends for the US to have found a treatment for this devastating, age-related neurodegenerative disorder, which currently afflicts more than 5 million Americans, by 2025. That would be good news, not a sign of the apocalypse, except for one small detail: he has requested only around \$50 million in new funding for the war this coming year. Now \$50 million might sound like a lot of money, and in a sense it is - right now government support of Alzheimer's research amounts to about \$600 million a year, so that's an 8% increase - however, the budget for NIH-sponsored HIV/AIDS research is over \$2.5 billion annually, which means that current funding for Alzheimer's research is, on a per US patient basis, about 20-30 times less than funding for AIDS research, and that imbalance won't change by much. So the President's announcement, welcome though it may be, is sort of like ordering, "Forward, march!" to an army of soldiers who have only one leg to stand on.

8) A number of sportswriting pundits - en masse, possibly the second dumbest creatures on earth - are predicting that the Boston Red Sox will win baseball's World Series this October. For those of you who don't follow baseball, let me simply say that is akin to predicting smooth sailing for the *Titanic*.

9) I once saw a mediocre 1950s B movie called *It Came From Outer Space* (these days considered a cult classic,

which may itself be a sign of the apocalypse). Apparently, *It* has arrived, and *It* is - a quasicrystal. A press release dated 12 January 2012 from Princeton University announced that a team of scientists had established that the only known naturally occurring quasicrystal was not formed on earth, but came here as part of a meteorite found in the Koryak Mountains of Chukotka in far eastern Russia. (As an aside, have you noticed that weird stuff is always found in some inaccessible part of far eastern Russia? Why don't we ever find weird stuff in far eastern Brooklyn? I mean, besides the people who live there.) Quasicrystals are solids that are ordered but aperiodic; they lack translational symmetry in at least one dimension. That's right, the alien civilization that actually is bombarding us from outer space, as opposed to the ones that only do so in B movies, evidently takes such a dim view of our planet that it can't even be bothered to pelt us with real crystals. Maybe they heard about my next sign:

10) According to a recent study by Cornell University Professor of Government Suzanne Mettler, many beneficiaries of US government programs seem confused about what government is for. She tells us that 44% of Social Security recipients, 43% of those receiving unemployment benefits, and 40% of those on Medicare say that they 'have not used a government program.' Perhaps they think their benefits are being dispensed by space aliens (the same ones that are dropping quasicrystals?). In any case, this degree of cluelessness may go a long way towards explaining my final sign:

11) News on CNN.com: *Scientists Discover Moderate Republican - Species Previously Thought Extinct*

The reported sighting today, in a remote region of Washington state, of a moderate Republican has provoked skeptical reactions from other scientists and locals. "We get these reports every four years or so," said Bedford County Sheriff Horace Jones. "They always turn out to be hoaxes or misidentification of something else, like a Democrat." As biologist Greg Petsko remarked, "A number of people have claimed to see one, but scientists are pretty sure the last moderate Republican died out in the Triassic era, when the giant Thesaurus roamed the earth."

OK, yes, I made that up. But how about this one: *Rick Santorum Declared Winner of Iowa Caucuses*. Unfortunately, that one is real. That's right: on 3 January 2012, a bunch of rural right-wing nutcases actually thought that an even bigger right-wing nutcase who believes in neither evolution nor global warming, wants to make contraception illegal, and thinks women with children shouldn't work outside the home, would make a dandy President of the United States - even dandier, evidently, than Mitt Romney, who has more money than God, or Newt Gingrich, who thinks he *is* God. To call Santorum a dinosaur is an insult to dinosaurs.

And it doesn't end there: on 7 February, former Pennsylvania Senator Santorum won three more Republican primaries, in the seemingly sane states of Minnesota, Missouri and Colorado. My friends in those states have tried to reassure me that turnout was low and, as one of them put it, "only the crazies voted" in those elections. Maybe they're right, but I take little comfort in that. My South African friends tell me that high turnout by 'conservative rural crazies' was the reason for the victory, in the 1948 election in that country, of the National Party. The result was the disgrace of apartheid and domination of the country's politics by right-wing religious racists for the next *forty-six years*.

Lest you think I do the man a disservice, consider this comment Santorum made: "One of the things I will talk about, that no president has talked about before, is I think the dangers of contraception in this country. It's not okay. It's a license to do things in a sexual realm that is counter to how things are supposed to be." Makes me wonder if, were we fortunate enough to finally develop a vaccine against HIV/AIDS, he would refuse to have his children - or anyone else's - vaccinated on the grounds that to do so would give them a 'license to do things in a sexual realm.'

Santorum, by the way, is among those religious conservatives who assert that the Founding Fathers intended the United States to be a Christian nation. What that suggests to me is, not only would he fail Biology 101 for his anti-evolution beliefs, he would also fail American History 101. Many of the Founding Fathers were actually atheists, and of those who weren't, a large number were Deists. Deism, whose closest modern equivalent is Unitarianism, has as one of its major tenets the denial that Jesus Christ was God. If Mr Santorum did his homework, he would probably be horrified to learn that, had the Founding Fathers intended this country to have any state religion (which they absolutely did not - try reading the Constitution, Mr Santorum), it would almost certainly have been a religion that he and his fellow Christians regard as a heresy.

By the way, *Philadelphia Inquirer* science writer Faye Flam, whose column/blog on evolution should be required reading for every genome biologist, has a wonderful piece about the possible evolutionary basis for the success of the Santorums of the world. You can read it at <http://www.philly.com/philly/blogs/evolution/Human-Evolution-Illuminates-the-Mysterious-Power-of-Political-Ads-.html>.

Believe me, if Rick Santorum's popularity is a sign of the apocalypse, his election to the presidency would *be* the apocalypse.

So for you apocalypse-watchers, let me suggest that, in addition to looking out for weird social trends and strange behavior in the scientific community, you pay close attention to the coming US presidential election. Its

outcome might say a lot about whether, in Muhammadan terms, we are living in a time when “leadership is given to people who are unworthy of it”. In this election, that may be a real possibility.

Or you could just wait for the sun to become black as sackcloth of hair. I’m not sure what that means, but it can’t be good.

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