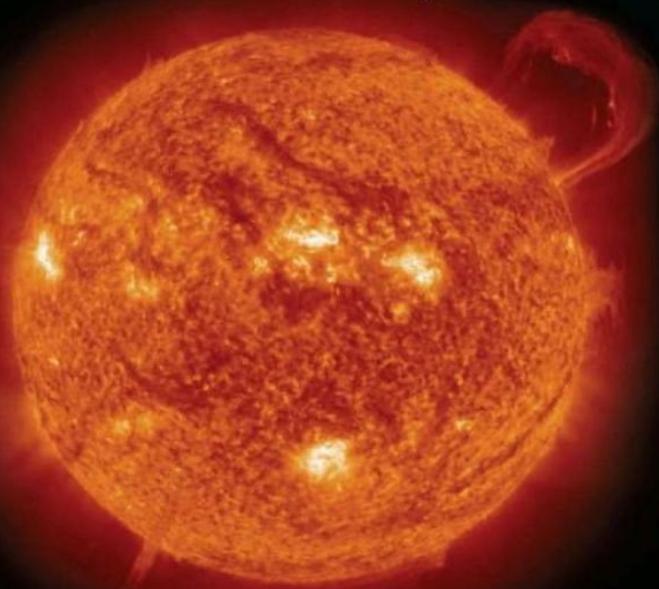


# APOCALYPSE

AN INVESTIGATION INTO CIVILIZATION'S END

LAWRENCE E. JOSEPH



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# **APOCALYPSE 2012**



A SCIENTIFIC  
INVESTIGATION  
INTO  
CIVILIZATION'S  
END

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LAWRENCE E. JOSEPH

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To Phoebe and Milo. I love you.



# CONTENTS

Acknowledgments	ix
<b>INTRODUCTION</b>	<b>1</b>
<b>GUILTY OF APOCALYPSE: THE CASE AGAINST 2012</b>	<b>16</b>
<b>SECTION I: TIME</b>	
<b>1. WHY 2012, EXACTLY?</b>	<b>23</b>
<b>2. THE SERPENT AND THE JAGUAR</b>	<b>34</b>
<b>SECTION II: EARTH</b>	
<b>3. THE MAW OF 2012</b>	<b>47</b>
<b>4. HELLFIRES BURNING</b>	<b>58</b>
<b>5. CROSSING ATITLÁN</b>	<b>73</b>

### **SECTION III: SUN**

- |  |     |
|--|-----|
| <b>6. SEE SUN. SEE SUN SPOT.</b>       | 87  |
| <b>7. AFRICA CRACKING, EUROPE NEXT</b> | 102 |

### **SECTION IV: SPACE**

- |   |     |
|---|-----|
| <b>8. HEADING INTO THE ENERGY CLOUD</b> | 119 |
| <b>9. THROUGH THE THINKING GLASS</b>    | 132 |

### **SECTION V: EXTINCTION**

- |                 |     |
|-----------------|-----|
| <b>10. OOF!</b> | 155 |
|-----------------|-----|

### **SECTION VI: ARMAGEDDON**

- |  |     |
|--|-----|
| <b>11. LET THE END-TIMES ROLL</b>      | 171 |
| <b>12. HAIL THE STATUS QUO</b>         | 188 |
| <b>13. 2012, THE STRANGE ATTRACTOR</b> | 199 |

<b>CONCLUSION</b>	219
-------------------	-----

Notes	233
-------	-----

References	241
------------	-----

Index	251
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This book has been optimized for viewing  
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# INTRODUCTION

On the first day of freshman writing class, the instructor told us that good writing was all about emotions—portraying them, eliciting them, unraveling them, being true to them. I stuck up my hand and stammered out something to the effect that, to me, emotions were just the details, and that what really mattered was whether or not people got to stay alive in order to have any. Happy, sad, angry, diffident, deep or shallow, shared with a loved one or burning from within—that’s all very interesting, but of secondary importance compared, say, to whether or not one is poisoned to death, or burnt to a crisp.

So when I first heard about how the world might end in 2012, I took to the idea right away. Except that no one in his right mind believes the world is really going to end. That’s the kind of thing weird men wearing sandwich boards and giving out smudgy pamphlets with lots of exclamation points on them like to claim. Theoretically, of course, the world must burn, freeze, crumble, or existentially wig out one day, but that’s billions of years down the road, right? Who knows, maybe by then we’ll all have moved to another planet, or even figured out a cure for time. But for all practical purposes, the unfathomable concept of the world coming to an end is used mostly to put

things in perspective, as in “it’s not the end of the world” if your pants don’t get back from the dry cleaners until Monday.

There are any number of end-time scenarios, from Hitler/bin Laden/Pol Pot getting his finger on the button, to an asteroid the size of Everest cracking the Earth like an apple, to the Lord God Almighty saying enough is enough. But our planet does not have to literally disintegrate, or all its inhabitants perish, for our world to come to an end, or close enough. If civilization as we know it, that burgeoning and magnificent social, political, and cultural entity, were damaged to the point where its evolution was retarded, where normal relations between nations were disrupted, where a significant percentage of human beings lost their lives and most of the rest faced a future of hardship and horror—that would count.

Since the early 1990s, I have been involved with a company that has sought to help save the world from poisoning itself. Aerospace Consulting Corporation (AC2), of which I am currently chairman, has begged, borrowed, and blood-from-stoned about \$10 million to develop the Vulcan Plasma Disintegrator, U.S. patent #7,026,570 B2, a portable, ultra-high-temperature furnace that will completely dissociate highly toxic wastes, including but not limited to lethal biological and chemical weapons that cannot otherwise be disposed of. The Vulcan, when it is finally produced, will be a fifty-yard tube with a robotic arm sticking out at one end. The arm grasps a fifty-five-gallon drum of hazardous, nonnuclear waste, samples its contents to prepare the right settings, sticks it inside the tube, which then heats up to 10,000 degrees, and zaps that sucker, container and all, into nothing: zero toxic residue.

There was always plenty of office space available at the Inhalation Toxicology Laboratory, out on Kirtland Air Force Base in Albuquerque, New Mexico. For next to nothing, our company had a nice suite and complimentary coffee station in the building out behind the kennel with the hundred identical dogs. True, the commute was an ordeal. After going through various security checkpoints, you had to drive all the way around the Electromagnetic Pulse (EMP) Testing Center, a giant wooden platform held together without a single metal nail or screw, on which they would zap, say, a specially shielded 747 jumbo jet, to see if its instruments would fry. Next was the Big Melt Laser Laboratory; no one would ever tell me what it was they melted. Then mile after mile of intercontinental ballistic missiles (ICBMs) in their

silos, dug into the hillside. The temptation to speed past them all had to be resisted because that part of the base is shoot-to-kill for vehicles violating the 30-mile-per-hour speed limit or any of the other traffic laws.

Over the past five years we have received considerable support and encouragement from Kirtland Air Force Base, a Department of Defense facility, and from Sandia National Laboratories, a Department of Energy facility responsible for, among other things, the construction and maintenance of every nuclear warhead in the United States.

For the record, neither AC2, Kirtland Air Force Base, nor Sandia National Laboratories, nor any employees or contractual workers associated with those entities are known to take any position whatsoever on predictions concerning the year 2012.



YOU DON'T NEED dire predictions about Apocalypse 2012 to freak out a little about all the weird stuff we've invented that could destroy the world. More than enough biochemical weapons are stockpiled around the globe, starting with mustard gas, a deadly paralytic agent left over from World War I, on through anthrax, sarin, and a variety of other classified compounds, to keep the Vulcan incinerating for many years to come. And the good news/bad news is that there will be even more incredibly toxic stuff to burn up in the future, at least according to those who share the fears voiced by Stephen Hawking, who believes that humankind will extinguish itself from the face of the planet through the misuse of biological weapons:

"I don't think the human race will survive the next thousand years unless we spread into space. There are too many accidents that can befall life on a single planet," Hawking told Britain's *Daily Telegraph*. Hawking, the Lucasian Professor of Mathematics at the University of Cambridge, expressed the opinion that the threat was not so much from a Cold War-style nuclear holocaust as from a more insidious form. "In the long term, I am more worried about biology. Nuclear weapons need large facilities, but genetic engineering can be done in a small lab."

What manner of vile pestilence will renegade eggheads concoct with their gene splicers? They might try to "improve" upon the worst Nature has to offer. For example, some of the latest strains of superbacteria have an

enzyme called VIM-2 that breaks down antibiotics. Genetically enhancing the VIM-2 enzyme could give the resulting superorganism a head start so big that antibiotics could never catch up. Perhaps the gene-splicing sociopaths will create “priobots.” By bolstering the already formidable self-replicating abilities of prions, these new predatory proteins could turn our brains into useless sponges through Creutzfeldt-Jakob disease, also known as mad cow disease. The priobots might also cause an epidemic of kuru, a brain disorder in which cannibals have been known to giggle themselves to death. How’s that for an evil genius’s last laugh?

Even if we catch these malefactors before they can do harm, the poisons that they cook up will have to be disposed of. But there’s no furnace hot enough to burn up such compounds without leaving toxic residue. That’s the niche that Vulcan seeks to fill. It just might save the world after all. That is, as long as it doesn’t explode. Since it’s planned as the hottest furnace in the world and filled with deadly waste materials, we’ve had to make damn sure the device is stable and secure. In fact, Vulcan’s underlying plasma containment technology has potential applications as a rocket thruster: basically, you just take one end off the containment tube, and zoom, the unit takes off. Upon command, presumably.

## ATOM SMASHING

Running a Vulcan furnace requires a megawatt of direct electrical power, enough to run about 25 contemporary, standard, three-bedroom homes, or 200 rent-controlled apartments in Park Slope, Brooklyn, where Victor Simuoli and I planned to construct our atom smasher for the annual Junior High School 51 science fair. The Atomic Energy Commission had kindly sent us the plans for a linear accelerator, a device that propels subatomic particles from either end toward the middle and then smashes them into each other head-on at terrific speeds. Seeing how incredibly complicated the blueprints were, and how running the atom smasher would probably have shorted out the whole neighborhood, Victor and I settled, as I recall, for making a crystal radio receiver out of a cigar box.

We probably wouldn’t have given up so easily if we knew there was a possibility that our atom smasher could potentially create a tiny black hole that would eventually destroy the world. Not, mind you, that we were pre-

Columbine or anything, just that, as two nerdy adolescents, the temptation of unleashing *Star Trek*-scale forces would have been hard to resist.

Though our machine would have been way too small to punch a black hole into space-time, the same cannot be said for the large hadron collider (LHC), a 27-kilometer circle on the border between France and Switzerland. When it begins operation in 2007, it will pack the colossal wallop of 14 trillion electron volts. A trillion electron volts, it turns out, is about the same amount of energy used by a mosquito to fly. The remarkable thing about the LHC is that it will concentrate its energy beam into a space one-trillionth the size of a mosquito, smashing protons into 10,000 pieces or more.

According to physicist Michio Kaku, the LHC's incredible focusing power will create "an entire zoo of subatomic particles not seen since the Big Bang," including mini black holes. Mini black holes? Intellectually scintillating though such a smash-up may be, questions must be raised about the calamity potential for some of these experiments. Don't black holes, mini and otherwise, have a tendency to suck up everything around them into oblivion?

Martin Rees, a colleague of Hawking's at the University of Cambridge, is a physicist who also has the distinction of serving as the United Kingdom's Royal Astronomer. Rees warns that the shower of quarks resulting from proton-antiproton collisions could create mini black holes, called strangelets, which have the capability of contagiously converting everything they encounter into a new, hyperdense form of matter. Atoms are made mostly of empty space, space that would be squeezed out by the strangelet, compressing the Earth into an inert sphere about the size of a Home Depot.

An inglorious ending, that.

## GRAY GOO

There's always a risk of unanticipated outcomes with new inventions—for example, the "gray goo" scenario that they try not to talk much about, up the road at Los Alamos National Laboratory, famed as the atom bomb's birthplace. Los Alamos is a leader in nanotechnology, which seeks to create nanoscale (billionth of a meter) machines designed to behave like the ribosomes in the cells of our body, assembling complex structures, such as proteins, out of simpler compounds, such as nitrogen, a key component. Nano-

technologists have discovered that, given the right circumstances, the atoms of certain elements naturally assemble themselves into complex structures; germanium atoms will, like cheerleaders at a football game, climb on top of each other to form a pyramid, defying the natural tendency of most atoms, and most noncheerleaders, to give in to gravity and remain on the ground. This self-assembly property proves quite convenient for all sorts of nanoscale endeavors, from breeding ultrapowerful computer chips from bacteria to creating infinitesimal machines that can be injected into the bloodstream to eat up cancers or infections.

What if the nanomachines' appetites got out of control? The result would be gray goo, a term coined by nanotechnology pioneer Eric Drexler, in *Engines of Creation*. Gray goo is a hypothetical nanosubstance that keeps on reproducing itself until it devours all the carbon, hydrogen, and whatever other elements it lusts for and has goosed over the face of the Earth. Imagine the parts of a box of Tinkertoys, carefully laid out on the right kind of mat, assembling themselves into, say, a Tinkertoy robot. Kind of cool. But now imagine that process going haywire, Tinkertoy Robot #1 making Tinkertoy Robot #2, and then those two making two more, and then those four making four more, with the numbers doubling into the thousands, millions, billions, in a runaway process that would continue until the world's raw materials were consumed.

According to Drexler, rapidly self-replicating nanomachines could outweigh the Earth in less than two days. The good news is that something would undoubtedly come along to devour the gray goo. The bad news of course is that there would then be untold gray goo devourers to deal with.

Save the world. Destroy the world. It's all pretty much the same ambition—that is, to prove beyond a shadow of a doubt the absurd proposition that life is divided into two roughly equal halves: oneself, and the rest of the Universe.

Strangelet black holes Pac-Manning the Earth. Priobots infesting our brains. Gray goo engulfing Life as we know it. Way too weird to lose any sleep over, but a man can dream. Ever since kindergarten days, when I and Marty Raichalk would spend hours in the backyard of the house our families shared on a dirt road in Danbury, Connecticut, protecting our imaginary girlfriends, Betty and Sue, from crazed murderers and bumblebees, I'd been waiting, you know, for an opportunity to show off my skills. In grade school

I ached to take on the Martians plotting to steal my brain. One's valuables must be safeguarded, for the sake of all decent people. And who knows how much evil could have been vaporized if Victor and I had ever managed to plug in that atom smasher?

Not to say that Vulcan, if we ever really get it up and running, won't prove lucrative. But that's just milkshake, and what we're talking here is pure malted ego, so rich you can sip yourself into a coma. To save the world from poisoning itself, the planet and the people. Now that would be taking a bow.

## SOLAR INDIGESTION

Being of Lebanese descent and therefore somewhat dark-skinned, I've always had a rather arrogant attitude toward the Sun—problems associated with it were what white folks had to worry about. So I couldn't be bothered at first, when Roger Remy, our company's principal scientist and founder, announced that the Sun was “making mayonnaise,” which in his idiosyncratic vernacular means “having a breakdown.” Roger is kind of a French Moroccan Indiana Jones gone-to-seed, who talks a lot about covert operations, known as “skunk projects,” and space travel. But his specialty is the manipulation of plasmas, intensely hot ionized gases, of which the Sun is an immense ball, so I couldn't just dismiss his statement outright.

Whatever the Sun's problems, they were 93 million miles away, unlike Christmas, which at the time, November 2004, was bearing down like a freight train. So with two young children, an exhausted wife, and overbooked holiday travel plans, I let the matter drop.

“The Sun can't get sick, you silly,” said my four-year-old daughter, Phoebe, who must have overheard a conversation. I was happy to agree.

On the day after Christmas, a close family friend died of an overdose of narcotics and antidepressants. The overdose was intentional, but the resulting suicide apparently was not. That day, December 26, 2004, was also the day the tsunami struck the Indian Ocean. In the week that followed, my wife grew more distraught over the death of her friend, a young woman of eighteen whom my wife had known since the girl's infancy, while I became preoccupied with the aftermath of the tsunami. I am sorry to say that neither of us had much compassion for the other's grief. The photo I will never forget, on the front page of the *New York Times*, was of a dozen or so people on a