

Il Foglio - Shellenberger

Why did you write *Apocalypse Never*?

I wrote the book first and foremost because most of what we have been taught to believe about the environment — from climate change and deforestation to renewables and nuclear — is totally wrong and we desperately need to get it right.

- What is wrong in the current environmentalism?

Climate change is important but it's not the most important environmental problem much less the end of the world. Wood fuel is worse than fossil fuels which are worse than nuclear energy. Going vegetarian has little impact on climate change. Renewables are terrible for the environment because they require hundreds of times more land than fossil fuels or nuclear. The driver of deforestation and environmental destruction in poor countries isn't greed, it's the justified need for food and energy. The greatest threat to sea life isn't plastics it's over-fishing.

What would you say to Italians and other Europeans who are afraid of nuclear because of Chernobyl?

I would ask them to consider if they're really so afraid of Chernobyl or if their fears come from a deeper place, namely fear of the bomb. After all, the scientific consensus is that just 200 people will eventually die from the accident and the radiation. That's a trivial number compared to any other major industrial accident.

Nuclear energy is environmentally superior to every other fuel including wood, wind, sunlight, coal, and natural gas by an order of magnitude or more on pollution, waste, and safety for an inherently physical reason: its high power density.

Can't renewables replace fossil fuels?

Remember that the industrial revolution couldn't have happened without coal. Wood just didn't provide enough energy. It's too energy-dilute. It's the same problem with today's renewables.

So-called modern renewables like wind and solar require about 400 times more land than a natural gas plant to produce the same amount of energy. They are energy-dilute and have very low power densities. For that reason, renewables are worse for the environment than fossil fuels and nuclear.

Right now, the supposed transition to renewables in Germany and California has nearly ground to a halt due to environmentalist resistance to building transmission lines and industrial wind and solar farms.

So everything people think about nuclear is wrong?

Not everything. We *should*, for example, be afraid of nuclear weapons. If we weren't afraid of nuclear weapons, they wouldn't work so well! But that's not the end of the story.

This year marks 75 years since Hiroshima and the evidence is overwhelming that nuclear weapons played at least *some* role, if not the key role, in keeping the peace. They did this first between the Soviet Union and the United States. Then they did this between the Soviets and Chinese. Then between Pakistan and India. And now it's happening between the US and North Korea and between India and China.

Just look at that funny little "war" that just happened between China and India earlier this month. It happened so fast you might have missed it. The leaders in both countries know very well that whatever fighting their men might do will not escalate. They talk to each other to make sure it won't escalate. The same was true with the "war" between Pakistan and India last year.

Pro-nuclear people, whether scientists and engineers or people in the nuclear industry haven't been honest about this because it contradicts the official U.S. government line, which is that nuclear weapons are bad, nobody should have them, and we nuclear-armed nations are going to get rid of them. But everyone knows that's a lie.

But shouldn't we get rid of them?

Let's say you somehow persuaded China, India, and Pakistan to get rid of their nuclear weapons. What happens if war breaks out a few years or months later. What then? Why it's obvious: they would race to re-build their nuclear weapons!

That reality reduces the incentive by nation-states to abolish nuclear weapons and would increase the incentive by nations to hide weapons programs if they ever did abolish nuclear weapons.

Political scientists at Yale University figured all of this out just weeks after the US bombings of Hiroshima and Nagasaki ended World War II. But the reality of nuclear deterrence is morally offensive to many people, particularly those on the Left, there was and remains an active effort to get rid of them.

What does that have to do with climate change?

Everything! More nuclear means fewer emissions means less climate change. Less nuclear means more emissions means more climate change. It's a one-to-one ratio. By contrast, solar and wind require huge amounts of natural gas because they are inherently unreliable.

Natural gas is also important for reducing emissions by replacing coal. But compared to nuclear it is popular and growing rapidly in market share. We are in for a long period of natural gas.

But ultimately gas still produces carbon emissions, albeit half as many as coal, and will need to be replaced. And yet Europe, the US, Japan and South Korea are all closing nuclear plants. Italy was one of the first nations to do so.

The underlying reason everywhere is that people don't like it. The reason they don't like it is because they are afraid of it. And the reason they are afraid of it is because they associate it with the bomb.

Thus, we are in the process of letting our irrational fears of nuclear power plants threaten the only source of energy that can replace fossil fuels.

But you also criticize climate activists for exaggeration. How do you think about the risk of climate change?

Climate change is an important environmental problem but it is not the most important environmental problem much less one of the greatest problems humans face. Poverty, the use of wood fuel, and the overconsumption of fish and other wild animals are all bigger environmental problems.

I advocate for nuclear not just because it's the only environmentally superior replacement of fossil fuels but also because its dual-use nature demands that we become increasingly skilled and experienced at working with it. We can't get rid of it. We should make the best of it. And the best of it turns out to be something quite remarkable: a pollution-free and near-zero waste energy source.

One of the major characters in *Apocalypse Never* is an Italian physicist named Cesare Marchetti. Who is he and why is he important?

Marchetti consulted with General Electric in the 1970s. It was there that Marchetti started playing with a model that GE's economists had developed to forecast product transitions.

Marchetti had adapted the model to forecast energy transitions, such as from wood to coal and whale oil to petroleum, in the global energy system. Marchetti overestimated the precision of these models, but he was directionally correct.

The punch line is this: by moving from energy-dilute fuels like wood, water, and sunlight to energy-dense fuels, first fossil fuels and then uranium, we use less of the natural environment because we are producing more energy with fewer materials.

The picture of environmental sustainability pioneered by Marcetti and Ausubel is thus the exact opposite of today's Green Party. Environmental progress is made when we move from wood to coal to petroleum to natural gas to uranium, not the other way around.

Was love of renewables and fear of nuclear politically motivated?

Politically and spiritually. In *Apocalypse Never* I show that anti-nuclear environmentalism was created after World War II by an unholy alliance of conservative Malthusians and post-Marxist socialists and anarchists. Both groups favored renewables and opposed nuclear, though for slightly different. The Malthusians hated nuclear energy because they thought abundant clean energy would result in overpopulation. The socialists adopted the vision of a renewable-powered organic economy as an alternative to socialist utopia. In other words, opposition to nuclear energy in the form of power plants had nothing whatsoever to do with the environment.

How do you explain the global success of Greta Thunberg?

On the positive side, she speaks to the desire of idealistic people, particularly adolescents, to reduce humankind's environmental impact and feel heroic while doing so. There's nothing wrong with that.

The problem is that she is also spreading misinformation. She is mischaracterizing climate change as apocalyptic. She is claiming that nuclear energy is dangerous, expensive, and largely unnecessary. And she is depicting economic growth as bad for the environment.

She was at her worst when she said, "I want you to panic." That's dangerous. The dictionary definition of panic is to behave unthinkingly from fear. We must not panic. People are hurt when they panic.

I don't want humankind to panic, I want us to behave with wisdom and courage. That's true for everything from climate change to nuclear energy to plastic waste.

Is environmentalism a phenomenon of the elite?

In the book, I describe how rich-world environmentalists are trying to make poverty sustainable when they should be seeking to make poverty history.

For example, at this moment, European NGOs and the European Investment Bank are redirecting investments from sources of cheap and reliable energy like hydroelectric dams to expensive and unreliable sources like solar panels and industrial wind energy in poor African nations.

Apocalyptic environmentalists are thus hypocritical in two ways. First, they try to stop poor nations from developing as they did, through deforestation and fossil fuels. Second, they are shutting down nuclear plants, and replacing them with natural gas, while raising the alarm about climate change. It's deceptive and unjust.

How did Malthusianism and socialism combine?

The socialists and Malthusians made an accommodation in the 1970s. Together they sought to restrict energy consumption in rich nations while modestly improving the living standards of subsistence farmers in poor nations. It's largely worked. As a result, the World Bank and other development banks now shifting their investments from the infrastructure of civilization namely roads, dams, and electricity grids to democracy training workshops, solar panels, and batteries, and the continuation of subsistence agriculture now dressed up as "organic" and "agroecology."

If you oppose their agenda, you become an enemy of humanity. How you explain and judge this demonization?

Apocalyptic environmentalism is, at bottom, a religious movement. It rests on pseudoscience and an overt rejection of science and rationality for a fantasy of apocalypse and a return to nature. Whenever anyone challenges the pseudoscience, apocalyptic environmentalists must attack them as evil, so as to move the conversation away from the substance to the person. Such efforts were especially aimed at scientists who documented the lack of evidence that climate change is worsening natural disasters.

Is there something wrong in Western culture if it has become so obsessed with the end of world?

Environmentalism is the new religion of supposedly secular elites. Because they are so alienated from traditional religion, few realize they have substituted nature for God, and are repeating Christian myths of the fall and the apocalypse. They genuinely believe they are people of science.

From one perspective, apocalyptic environmentalism is thus serving a purpose: it's meeting the spiritual needs of wealthy Westerners who needed some higher power and purpose to believe in.

The problem is that, in their spiritual quest, apocalyptic environmentalists are hurting people and degrading natural landscapes. As a rule I don't argue with religious sectarians. But in this case, the religious sectarians are causing real harm in the world, and that needs to stop.

It's time for us or consciousness to evolve. That starts with understanding why power density, whether in food or energy, determines environmental impact. And it includes overcoming our often irrational fears of our extraordinary new powers.

I truly believe we will evolve out of apocalyptic environmentalism into something more humanistic and pragmatic. It will take time. People need to get educated about some basic facts and processes. But I believe it is inevitable that this consciousness shift will happen. I wouldn't have written *Apocalypse Never* if I didn't.