

Watt's Happening? #281

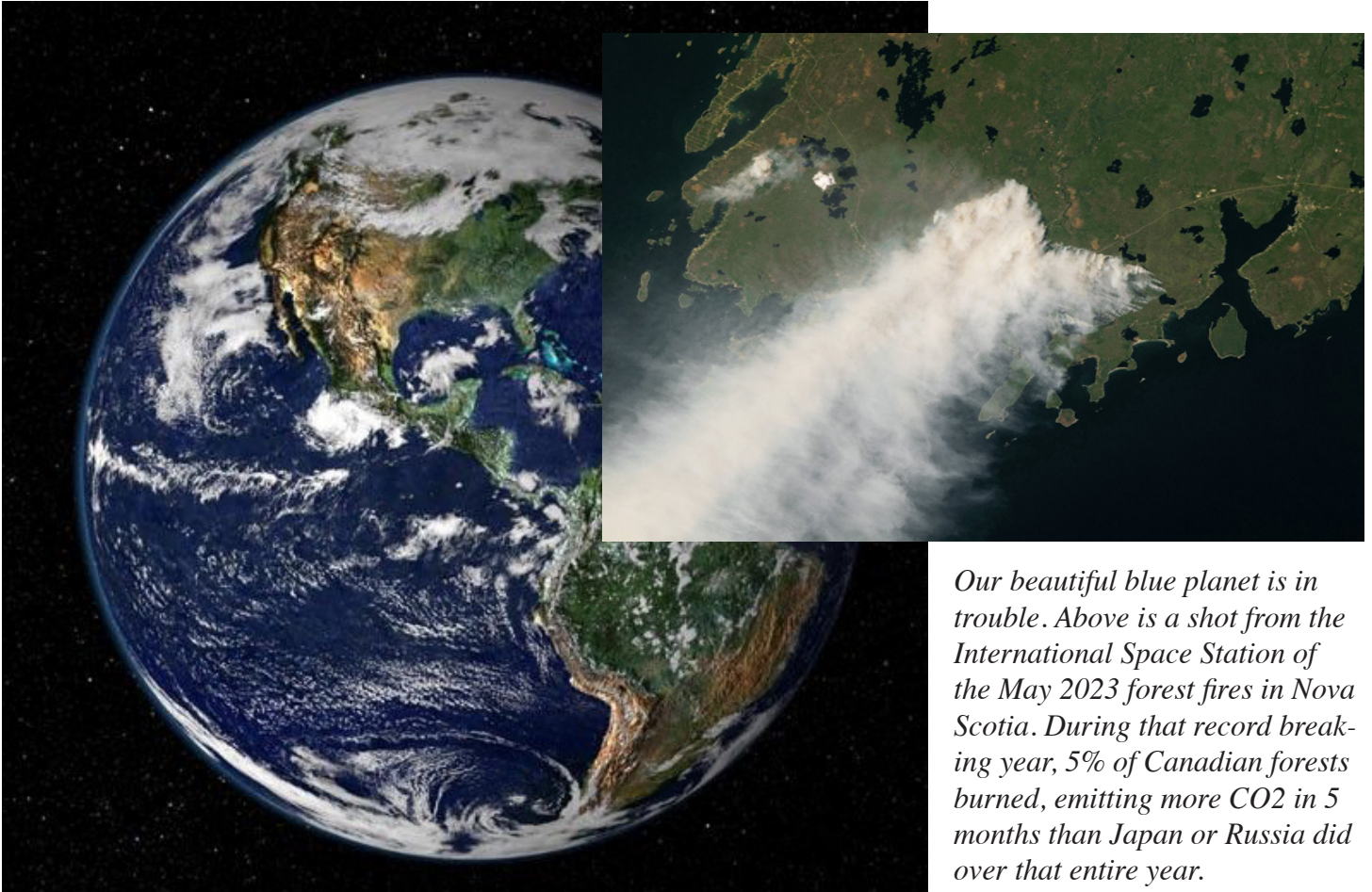
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The Story of CO₂ *is the story of everything!*



Our beautiful blue planet is in trouble. Above is a shot from the International Space Station of the May 2023 forest fires in Nova Scotia. During that record breaking year, 5% of Canadian forests burned, emitting more CO₂ in 5 months than Japan or Russia did over that entire year.

If you are interested in understanding just where we are at these days with climate change, here is the book for you: *The Story of CO₂ is the Story of Everything* by celebrated science writer Peter Brannen.

I finished it a month or so ago, and am still reeling from the remarkable perspective that this writer has given me: carbon dioxide isn't just some industrial by product that is causing some big climate change problems, CO₂ is literally the stuff of life. Without it, life could not exist on this planet. It's all about carbon dioxide.

CARBON IS LIFE

It is the gas that makes life on this little blue planet possible. Cycling through the crust, the oceans and the atmosphere over hundreds of millions of years, carbon dioxide has managed to keep the planet habitable and filled with carbon based life forms, like you and me and every living thing that has ever lived on Earth. Yep, we are carbon-based and CO₂ is where all that carbon comes from.

Carbon dioxide also controls our planetary temperature, that is, our climate. When CO₂ was high

in the geologic deep past, the planet sweltered in a climate that was great for dinosaurs and palm trees in a balmy arctic, but way too hot for mammals to survive. When CO₂ fell, ice sheets quickly covered the poles, ice sheets miles thick swept across the continents and sea levels fell by hundreds of feet.

THE CARBON CYCLE

Ejected from volcanoes, carbon dioxide becomes incorporated into all living things, and then is buried as limestone, coal and oil. Eventually subducted under the churning edge of a continent, it is driven down into the molten core of the earth, and eventually comes out of the throat of a volcano as CO₂ once more. This continuous movement of carbon makes the Earth what it is today. This is called the carbon cycle.

This system has remained remarkably stable over vast time scales, allowing complex life to evolve over hundreds of millions of years. But there have been problems.

MASS EXTINCTIONS

There have been a few brief, terrible periods when the carbon cycle has spun out of control (that's what's happening now!). These are the cataclysmic episodes of mass extinction, the worst of which have wiped out life on earth almost completely.

The asteroid impact that killed off the dinosaurs 66 million years ago is the one exception. The other 4 mass extinctions were all caused by changes in CO₂ levels in the atmosphere from massive volcanic eruptions.

Too much CO₂ and we get

a Hothouse Earth, extreme ocean acidification and massive die off. Too little and we get ice ages: Snowball Earth.

TODAY'S WORLD

But overall, things have been pretty good for carbon-based life on planet Earth. The last ice age ended about 10,000 year ago, and the climate became ideal for agriculture. We have prospered.

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Until the industrial revolution came along, and now everything is changing again.

“...every ten weeks humans burn through as much carbon as is contained in all the animals on Earth...This industrial respiration now injects over a hundred times more CO₂ into the atmosphere every year than all the volcanoes on Earth.”

“...a million years of ancient photosynthesis captured in Carboniferous coal forests suffices to slate the appetite of only about three years of human consumption.” Thanks to this immense surge of stored geologic energy, “8 billion people can now do the energetic

equivalent of 500 billion tireless preindustrial labourers.”

But there is a price we are beginning to pay for such historic luxury. Brannen quotes geochemist Michael Russell: “You cannot expect to take fossilized solar energy for three hundred million years and let it off in a bang in a hundred and fifty years and get away with it. It's ludicrous. Of course it's going to be awful.”

We are, without a doubt, driving the climate on a geologic scale towards an unhappy future.

SO WHAT TO DO?

Accelerate the rapid transition to renewable energy that has already begun. Thanks to the growing use of solar and wind energy plus electric transportation, there is hope. This trend must continue, and accelerate exponentially, immediately. Not by 2050 as is so often promised, but now.

Brannen is not optimistic that we will be able to pull this off, but knows that it is actually possible with a war-scale effort and multi-trillion dollar commitment to change.

“I know that maintaining our current path will lead toward certain climate catastrophe, so whatever the odds of our success to alter this trajectory, there is only one way to find out, and we might as well give it our best shot.”

For a clear understanding of our global climate history, why we have ended up in this perilous place and what must now be done, read, “*The Story of CO₂ is the Story of Everything*.” It will amaze you.