

Natural Disasters

Lecture 30 “How Earth Was Made” (Part 1)

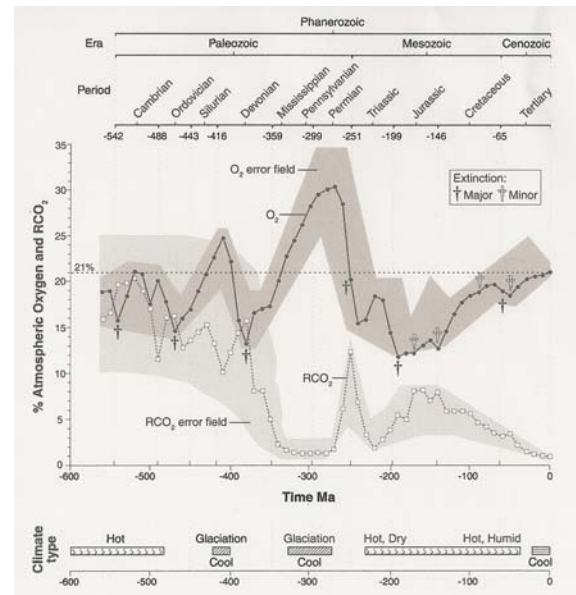
Text Source Today:
None.

12.2: Ch. 12 – Future Climate Change

- Around the time of the ***Cambrian Explosion*** (543 million years ago), **CO₂** levels were perhaps **more than 20 times present-day values!**

- About **400 million years ago**, **CO₂** levels began a **100 million year long plummet**, as **vascular plants** began to cover the planet. Great quantities of **carbon** began to be locked up as **rotting**

vegetation and eventually in **coal, oil and gas beds** (to be known as the ***Carboniferous Period***). During that time, **O₂** levels reached high levels (**over 30%**).



- Over the **past 100 million years**, **CO₂** has been **on the decline** again, dropping to present-day historically **low levels**. This appears to be driven by **tectonic events**, most notably the geological uplift and subsequent weathering of the **Himalayan Mountains**. This is coupled with the **further spread of plant life** across the ever-growing land areas.

- ◆ It is believed that our **recent rapid global warming** will bring about rising sea level, a possible increase of storms, more drought and floods, a disruption of agriculture and a migration of tropical diseases into temperate regions.

- As Earth heats up, **wars over food, water and habitable land may increase.**

♦ In the very near term (geologically speaking):

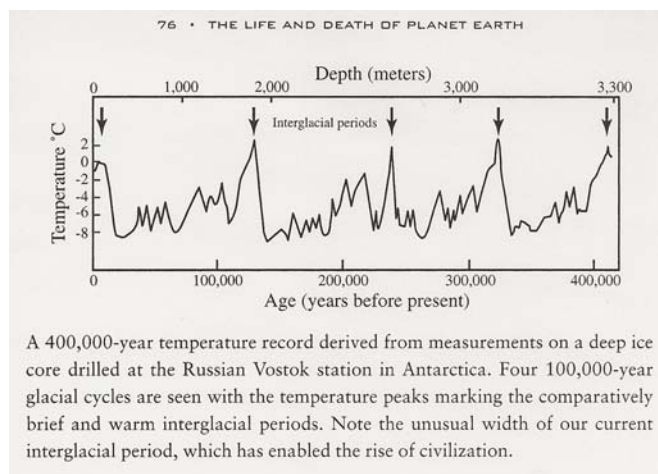
- 1) Atmospheric **CO₂** has **increased 30%** since the start of the **Industrial Revolution**, to the highest level in **450,000 years**;
- 2) **CH₄** is up **145%**.
- 3) The Arctic icepack has thinned **40%** in the past **20 years**.
- 4) The Arctic Ocean may be **ice-free** in summer by 2040.
- 5) Shrubs are growing on Arctic tundra.
- 6) The Alps have lost half their glacial ice mass since the 19th century.
- 7) The snow of Africa's Mount Kilimanjaro may be **entirely gone in 15 years**.
- 8) **Mosquitoes** are found at higher elevations in the tropics and are spreading tropical diseases to higher latitudes.

● The **IPCC** projects that average global temperatures could climb to **1° to 6° C** during the 21st century.

+++++

♦ In a few centuries, **most fossil fuel will likely be exhausted**. New energy technologies will have to be developed. The pumping of **CO₂** into the atmosphere will slow, then cease, and natural mechanisms will **resume the process** of lowering **CO₂** concentrations. **This will lead Earth back to an Ice Age**.

♦ Human civilization has developed during a brief **“interglacial”** that has lasted only about **12,000 years** and **may already be ending**.



- The inevitable return of an **Ice Age** will effectively end the world as we know it. Humans will have to abandon their planetwide occupation and be content with a more precarious existence in the **mid-to-low latitude regions**.

- The **numbing cold, ice, dust and drought** may be the norm for the next **90,000 years!**

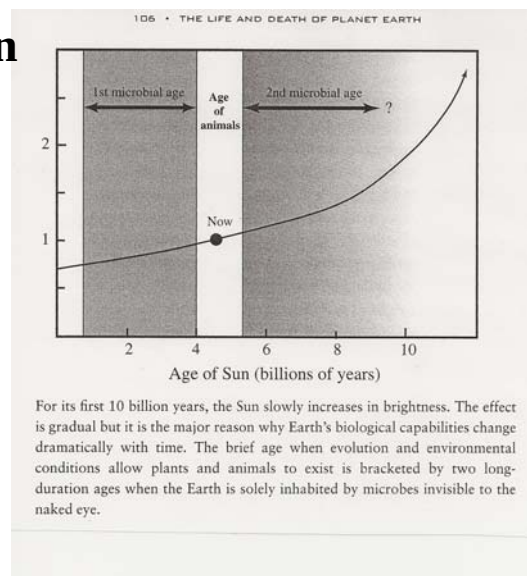
+++++

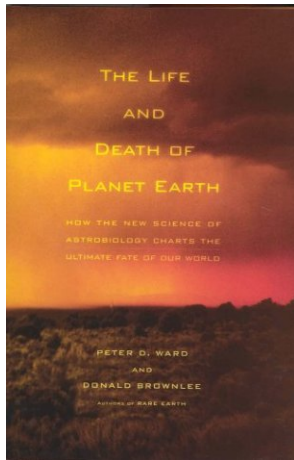
- About **250 million years from now**, the world's landmasses will be reassembled into a new single **super-continent**. Could this lead to another mass extinction?

- ◆ About **500 million years into the future**, **CO₂** levels may have dropped to **under 150 ppm**, turning the world **brown**, as the **end of plant life begins**. The **last of the animals** will be **asphyxiated** from lack of **O₂** with a few million years after that.

- ◆ At some point between **500 million and a billion years from now**, **land life** as we know it **will end** on Earth, due to a combination of a starvation of **CO₂** and increasing heat from our expanding Sun. **The 2nd microbial age will begin.**

- ◆ Even if we could find another **“Earth-like” planet**, we would have to discover it during the **relatively brief 10% of its existence** (~1 billion year period), **when it had flourishing plants and animals!**





Peter D. Ward and Donald Brownlee, *“The Life and Death of Planet Earth: How the New Science of Astrobiology Charts the Ultimate Fate of Our World,”* Owl Books, (2002).

[Read reviews or order this book safely from Amazon.com on-line book store.](#)

12.2: Ch. 12 – Climate Change

● DVD: *“How the Earth was Made”*, THC, 2007

♦ **Question #1:** According to South African geologist Gary Stevens, what rock had a unique shape that indicated it was formed under water, in an ocean 3.5 billion years ago?

_____ **You must watch the video to get these answers!** _____

♦ **Question #2:** What of Earth’s greatest secrets was revealed when the U.S. Navy made detailed maps of the ocean floors to be used for submarine warfare during World War II?

_____ **You must watch the video to get these answers!** _____
