

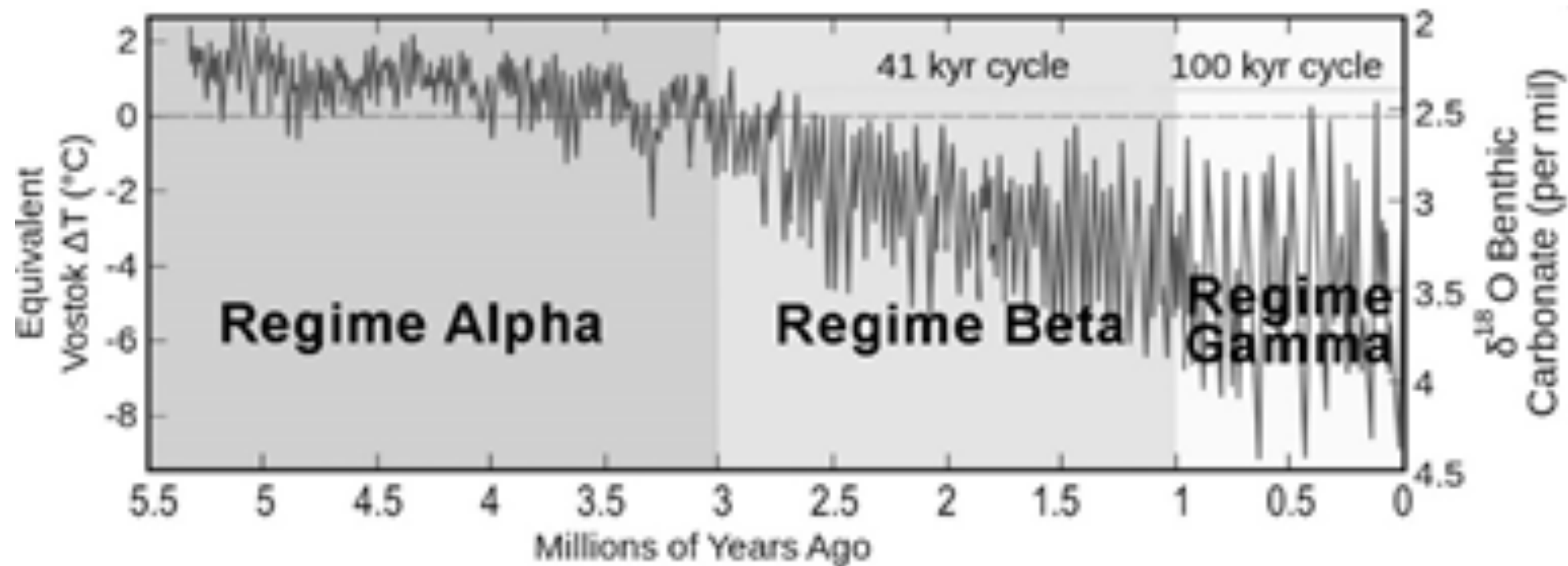
Explaining Ice Age Causation:

One of Mankind's Most Perplexing Questions

Richard E. Klein, PhD.

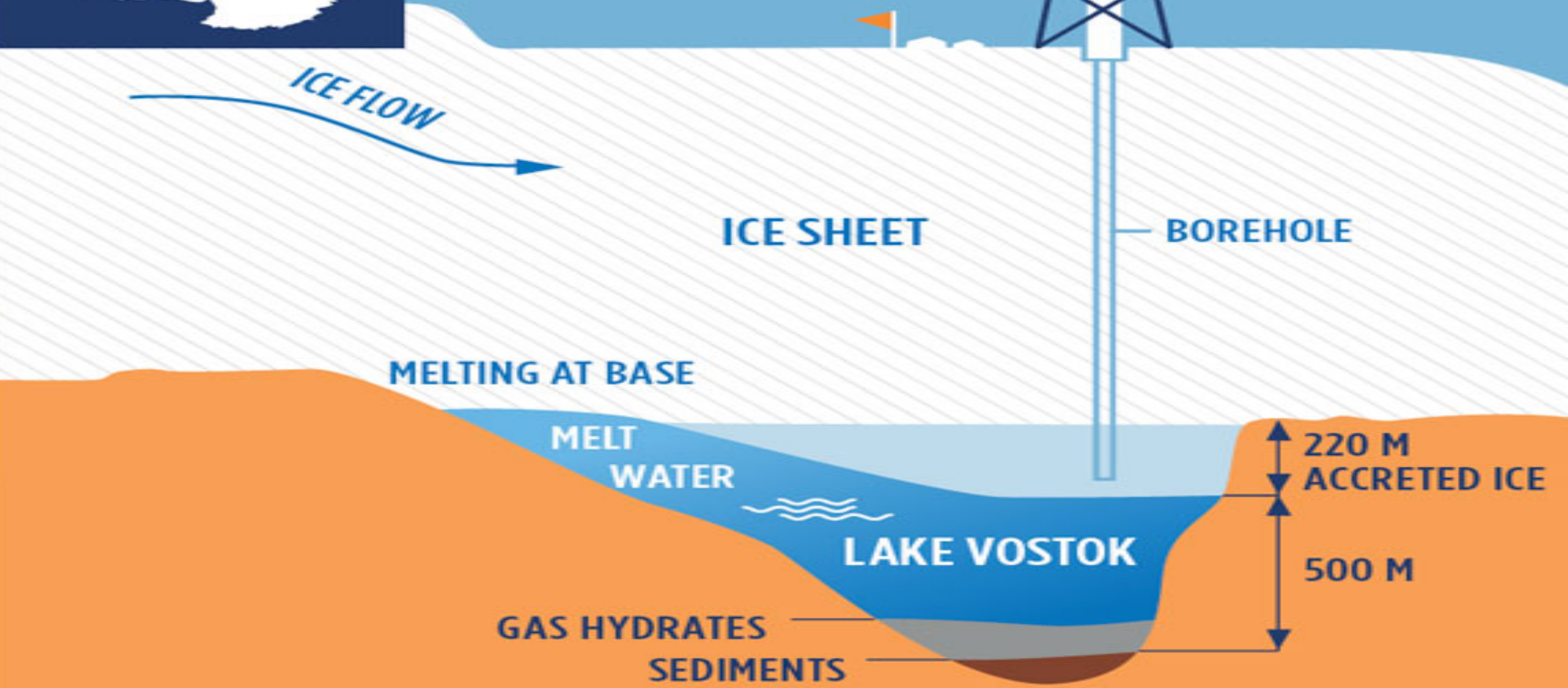
Neil Armstrong:

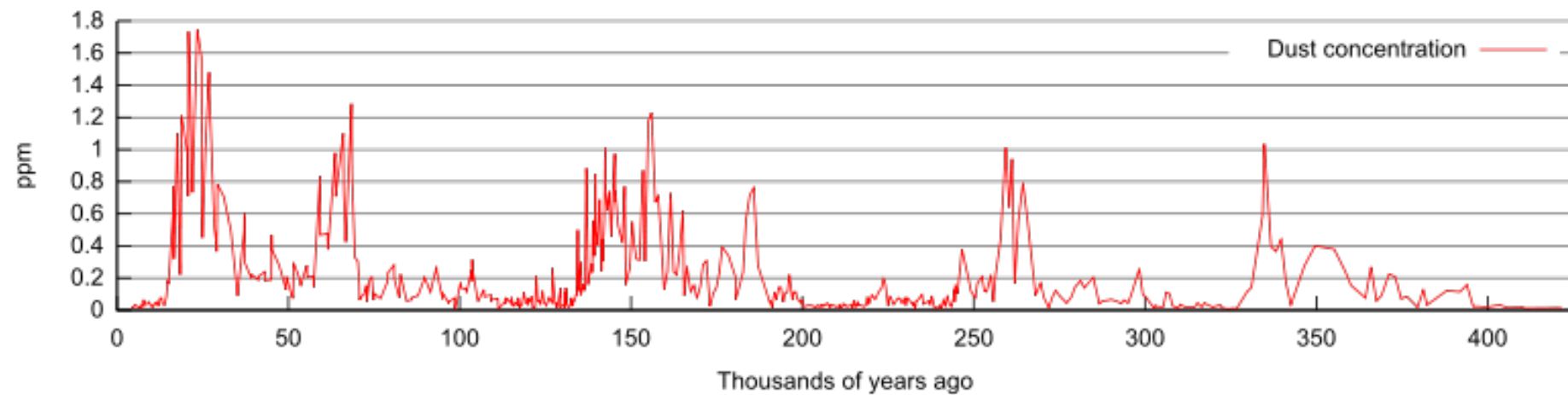
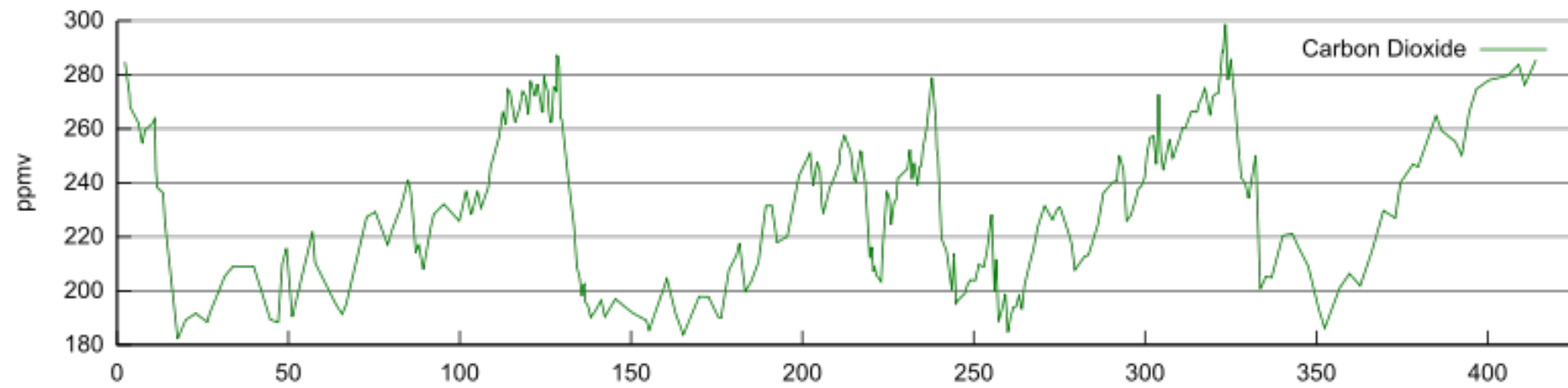
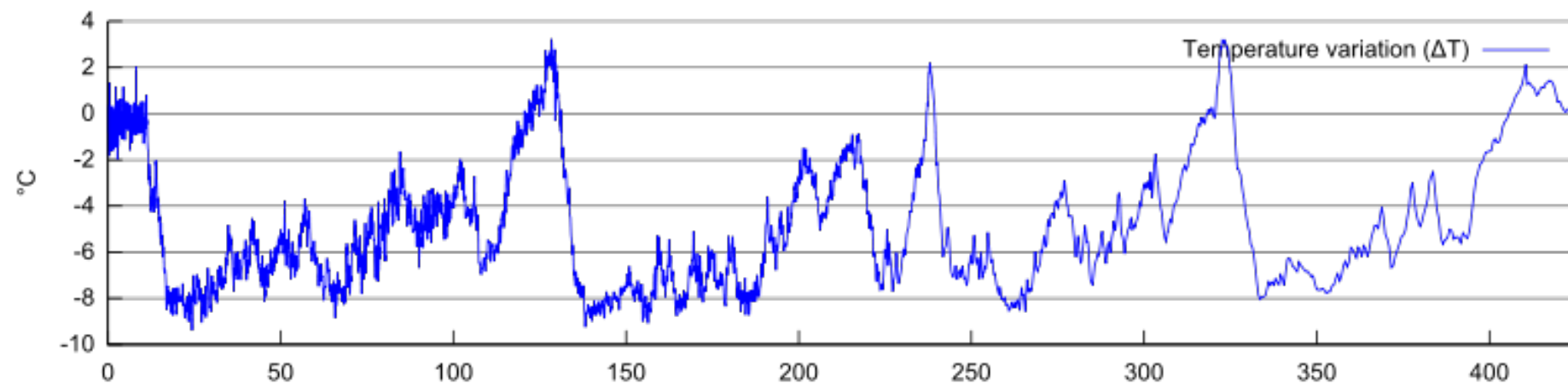
- “Geologists have a saying: rocks remember.”





VOSTOK STATION AND EAST CAMP





Milutin Milankovitch (1879-1943)

- Milankovitch was a Serbian mathematician whose work on the Earth's ice ages spanned about thirty years between 1911 and 1941.
- Milankovitch was the first to observe that Earth has experienced numerous and cyclical ice ages.
- Ice ages are commonly referred to as "Milankovitch Cycles."

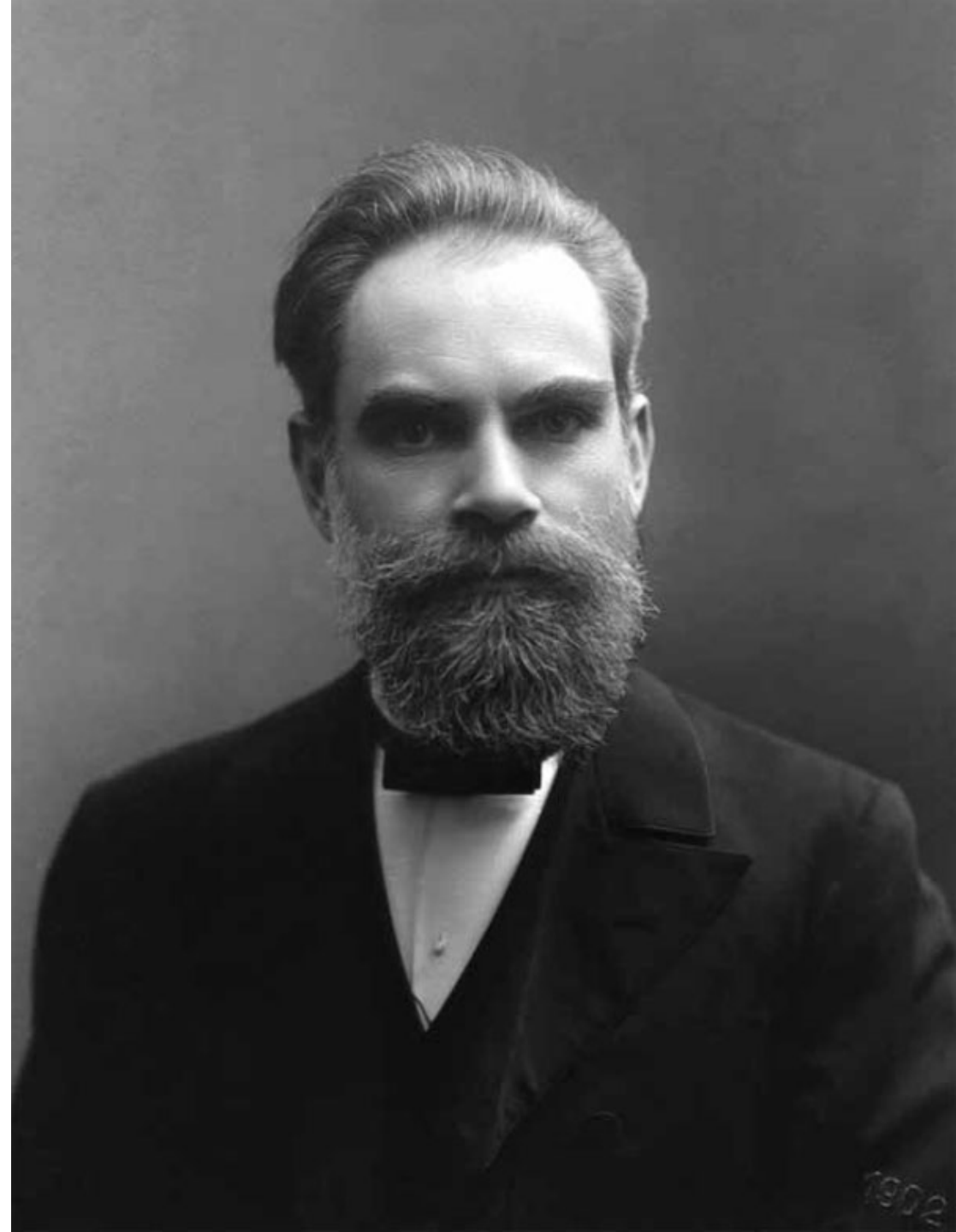




- > Machine tool chatter
- > Household furnace
- > Fingernails on chalkboard
- > Zig-zagging farm implement
- > Shivering in response to being cold

Aleksandr Lyapunov

1857 - 1918



Limit Cycles

> Simple (Low Order)

> Restless; forever wandering or hunting

What causes cyclical ice ages? Many Explanations have been put forth.

1. Earth's "Wobble"
2. Sun Spots
3. Asteroids
4. Volcanic Eruptions
5. Continental Drift
6. Continental Lifting

Albert Einstein:

- “Only two things are infinite, the universe and human stupidity, and I’m not sure about the former.”

Several Tests:

Abruptness

Frequency Change

Massive Flooding

Layered Earth Deposits

Self-Generated Cycles? (Lyapunov Cycles)



Lake Nyos (Cameroon, 1986)

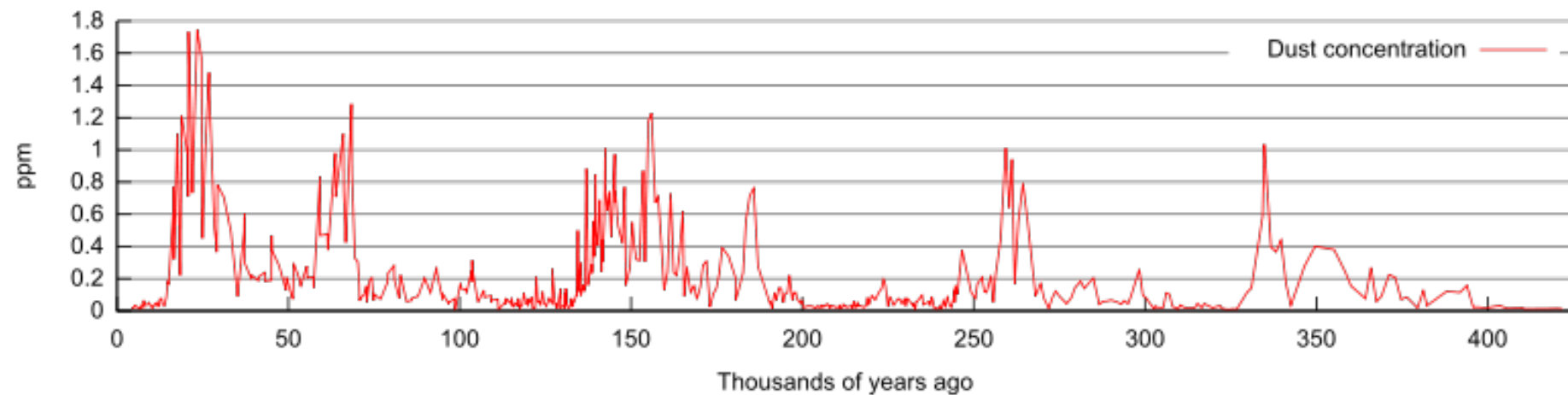
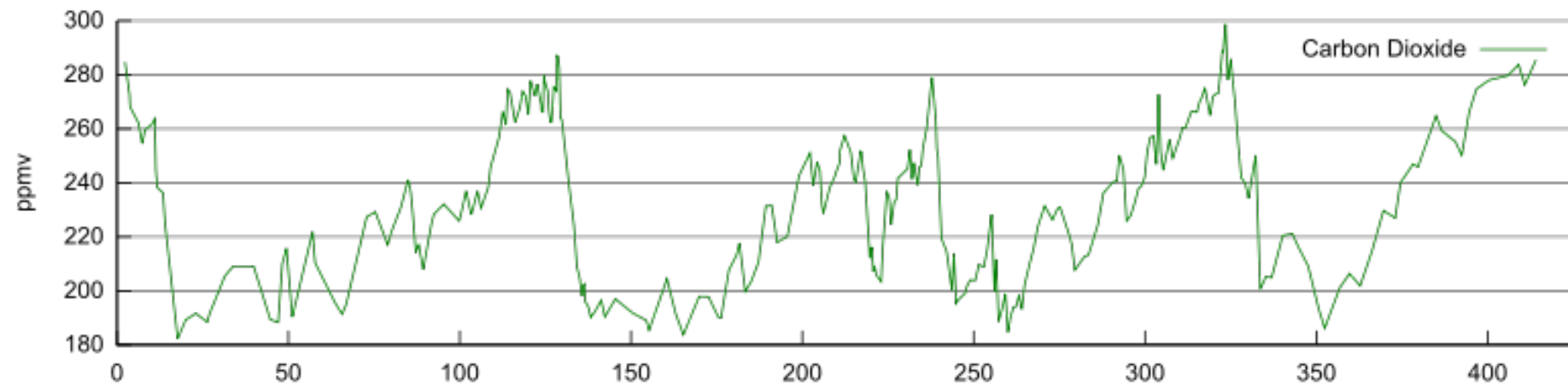
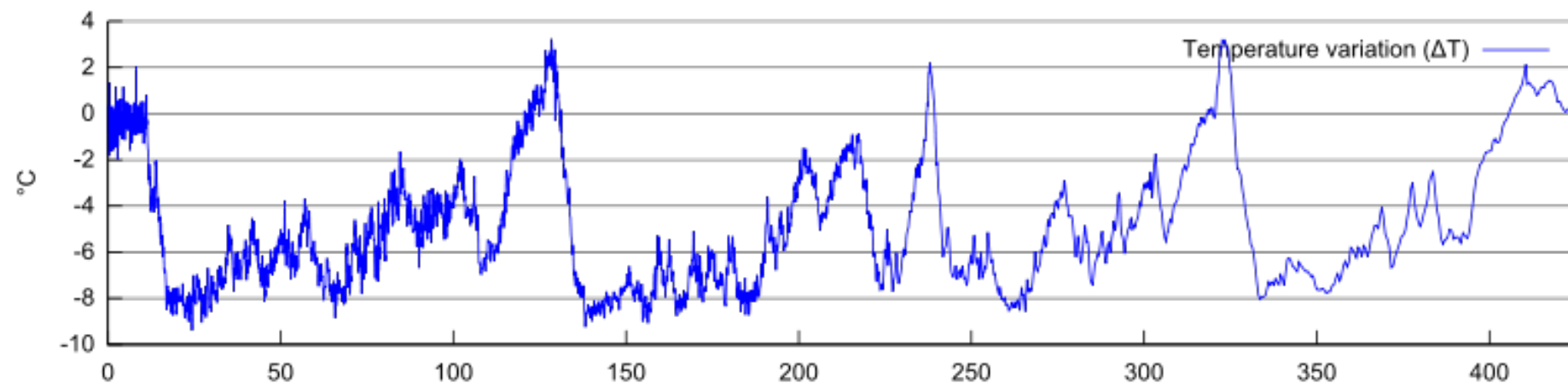


108553717

The Kleinian Assertion:

Ice Ages are self-generating and cyclical;

Oceans become unstable, overturn, and belch (degas) every 100 thousand years.



Carbon Dioxide Questions:

When atmospheric CO₂ drops, where does it go?

Who leads the dance: CO₂ or Temperature?

That temperature lags behind the overall Earth temperature.

Worldwide, temperature leads and CO2 lags.
I.e.: Greenland data show that CO2 lags Temp. by 800 years.

- > Why does it get cold?
- > Why does temperature rebound abruptly?
- > Why is this cyclical?

I assert that my *Kleinian Hypothesis* is compatible with the extant data.

Science is not all powerful; science has limits as to what it can and cannot do.

> We simply are not able to conduct a laboratory experiment.

> Even if we could, our impatience demands answers now – certainly not waiting 90 thousand years.

> Computer simulation is fruitless.

Climate Change?

- Arguments over global climate change are pointless.
- One must first explain ice age causation. Then, and only then, can the global climate change debate proceed.

SHIVERING

Heating Up

~~COOLING DOWN~~

THE GLOBAL WARMING DEBATE



RICHARD E. KLEIN, PhD