Special Report on Current Climate Change #2

In our first report dated March 12 this year, we drew attention to the prolonged cold as a possible manifestation of a known association between such periods extended over many years and failures in the sunspot cycle, when fewer sunspots appear and sometimes none at all over equally extended periods of time. Recently solar physicists have become somewhat alarmed over the failure of the solar maximum to develop normally, reaching barely half its expected value.

In the first report (Bulletin # 924) we wondered if the cold spell was a one-shot affair or the beginning of something more prolonged and with graver consequences. At the time we remarked, "By the end of March we may have a much better idea." That time has come and the solar maximum continues to be low and presumably due shortly to begin its decline. Weather in the eastern part of our continent has been tracking several degrees below normal in the meantime.

We recognize the nonuniform temperature distribution in the northern hemisphere, with a concentration over North America and scattered manifestations in Asia and Europe. The North American experience appears due to a larger-than-normal pool of polar air with an extended lobe arching down over the continent and concentrated in the east. As our hemisphere tilts increasingly toward the sun it warms up, of course, but more gradually this time around, even as temperatures in the southern and middle states of the US rebound. That's all we know at present.

Meanwhile the cool wet spring we feared appears to be materializing, causing increasing concern among grain farmers: "Right now it's primarily affecting corn planting and spring grain planting," says Todd Austin, Marketing Manager for Grain Farmers of Ontario. "Maybe one percent of the estimated total acreage has been planted to date. It's going to be a concern over the next two weeks for producers to decide if they will keep corn in their rotation, change the hybrid that they're going to grow or switch over to soy beans rather than corn."

At Last, a Linking Theory

In the previous report we complained, "There is no theory yet that tells us just how sunspots should affect weather on our planet. Somehow, they may help to keep us warm." New to questions of climatology, with my interest triggered by the recent

prolonged spell and coincidental sunspot maximum failure, it didn't take long to find the missing theory. The name Svensmark came up, one that I was already familiar with for theorizing a connection between distant supernovae explosions and extinction episodes in the Earth's paleozoic past. What was he doing here?

Dr Henrik Svensmark has set off a whole new thread in climate research as the result of a 20-year research program with colleagues on the connection between cosmic rays and cloud formation right here on Earth. It works like this:

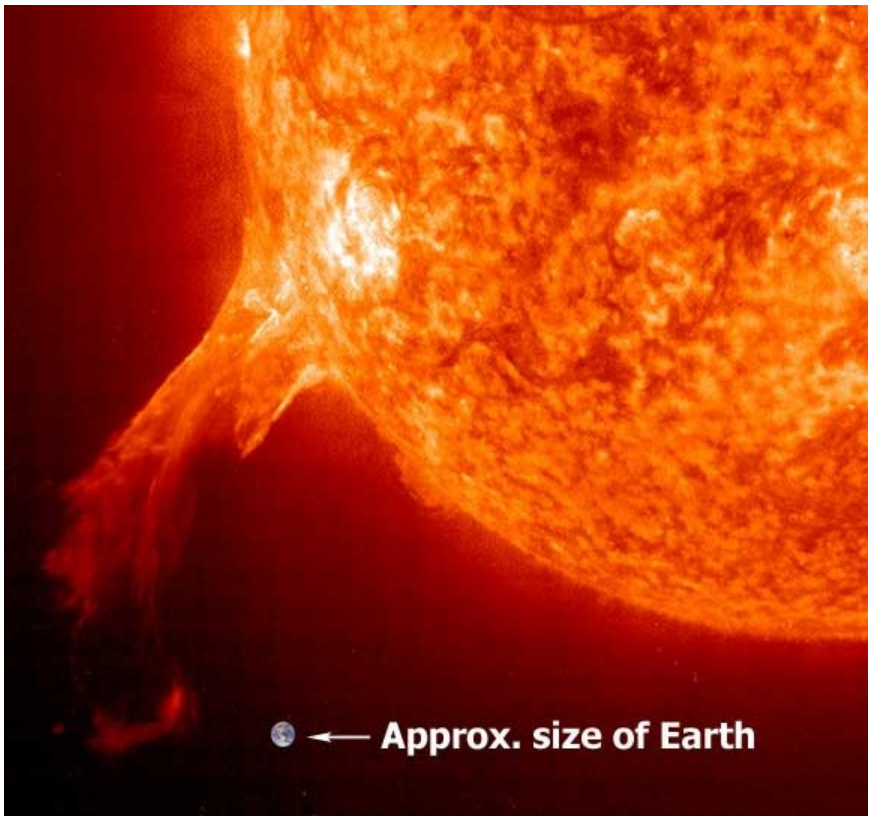
1. The Earth is being constantly bombarded from all directions by cosmic rays generated in the hearts of massive stars that explode in what is known as a supernova. The rays (actually particles) fly out in all directions at near light velocities. Such explosions occur both in this galaxy and in neighbouring ones with a frequency that guarantees a nearly constant supply of cosmic rays virtually everywhere in the known universe.
2. Cosmic ray particles that reach the Earth penetrate its atmosphere unless they are deflected by the sun's magnetic field before they reach the Earth. The Sun's magnetic field varies over time, reversing every 11 years. If strong enough, it deflects the particles, if not, they get through.
3. If a cosmic ray strikes a molecule (or two) of water in the atmosphere, it promotes the amalgamation of the molecule(s) with neighbouring ones to form a micro-droplet of water. The process of condensation and of cloud formation can thus be kick-started by a cosmic ray shower.
4. The thumbnail conclusion: if the sun's magnetic field is strong, cloud formation is subdued, more of the Sun's heat gets through and the climate (in an overall sense) tends to heat up, with lower precipitation. If the Sun's field is weak cloud formation is heavier, less heat gets through and the climate gets colder, overall.

I can't say that my own understanding of the process goes much beyond this, but readers may find the following video rather interesting. It's about Svensmark and the process of discovery. Watch for the chart of the correlation he and his team found between the Sun's magnetic field record and the corresponding global cloud cover data over the years. Such strong correlations are rare in meteorology.

http://theresilientearth.com/?q=content/chilling-stars-author-henrik-svensmark-video (Scroll down to pair of videos.)

Since sunspot formation (the solar cycle) runs in lockstep with magnetic pole reversals and since the current solar maximum was weak, does that mean that the magnetic field has also weakened? That would be bad news.

The Sun is basically a huge magnetic/fusion furnace with a surface that “boils” with granules, convection cells of solar plasma, as shown in the image below. Here a prominence of plasma that follows magnetic field lines erupts from the surface.



NASA Image

Future Developments

We will add more reports as necessary to track the current surge of cold weather, but hope to cancel them as soon as the climate turns to “normal”, whenever that might be. We will also issue a summary critique by climate scientists of the global warming hypothesis — but only as a personal one-off and not as a *Bulletin*.

Kee Dewdney