

## CLIMATE CHANGE FOREVER: TRUTH AND CONSEQUENCES

by Harm de Blij

**Stopping Climate Change**, shouts the cover of the 5 December 2009 *Economist*. Its accompanying editorial ‘leader’ states that “we do not believe that climate change is a certainty ... there are no certainties in science” (so much for plate tectonics and evolution). As a preface to such nonsense, the same highly respected newsmagazine, in a leader several years ago, asserted that, after anthropogenic emissions into the atmosphere are brought under control, “climate change will be with us for at least another century.” One supposes that, after billions of years of it, we should all heave a sigh of relief. Unfortunately, the quip is rubbish.

Here is the *real* inconvenient truth: climate change will shadow humanity’s future whether or not the global campaign to limit greenhouse-gas emissions achieves even its most comprehensive goals. If we were indeed able to eliminate all anthropogenic emissions immediately, climate change would not end. What would happen is that, over millennia, the complex, interlocked natural cycles that have always driven planetary climate change would again prevail, and all life on Earth would once more be subject to nature’s long- as well as short-term variations that have always been part of evolutionary processes.

These variations range from slow and inexorable transitions to abrupt and even violent reversals. A global warmup of almost unimaginable intensity drove back the great sheet glaciers, products of the most recent glaciation that covered the heart of North America as far south as the Ohio River less than 20,000 years ago. Then, just when it would have seemed that such warming was irreversible, the Northern Hemisphere was plunged back into glacial cold some 12,000 years ago, a catastrophic cooling that lasted more than a millennium. This episode, known as the Younger Dryas, seemed to presage a return of the glaciers – but nature had other plans. The warmup resumed, and subsequent variations (such as the misnamed “Little Ice Age” starting around AD 1300) were nothing like the Younger Dryas. For nearly nine thousand years, global climate has varied, but within far narrower limits.

None of this means that climate has stabilized or that future events such as the Younger Dryas (or, for that matter, a return to full-scale glaciation) are inconceivable. One lesson of the geologically recent past is that even comparatively minor climatic fluctuations can have enormous impact on regional environments, shifting biomes, threatening species, desiccating farmlands, generating weather extremes. On this basis alone, mitigating humanity’s prodigious pollution of the planetary atmosphere is a sound objective. Should current anthropogenic greenhouse-enhancement coincide with a natural warming phase, the combined effect could indeed be calamitous, a Younger Dryas in reverse.

However, we do not know enough as yet about the periodicity of planetary climate change, except in the most general terms. Planet Earth today is experiencing an ice age; ice ages last tens of millions of years and display alternating periods of cooler and warmer climate, the cooler glaciations lasting much longer than the warmer interglacials. The cooler glaciations are not uniformly cold, and the warmer interglacials are not invariably toasty. That's why Neanderthals and modern humans managed to survive and compete in Europe during the most recent, 100,000-year-long glaciation: time and again bitter cold gave way to milder interludes. But then, just before the warm interglacial we are experiencing today, this most recent glaciation got serious and pushed huge continental glaciers southward into the heart of North America and Eurasia. The boreal forests of present-day Canada and Scandinavia shifted southward into Iberia and Mexico. Ice covered the Midwest north of the Ohio River. Between the ice and the forests lay the Siberia of America, a tundra of mosses and lichens.

The surge of global warming that melted those glaciers almost as fast as they had appeared heralded the warm interglacial that witnessed the rise of human civilizations and the population explosion that followed. Except for the inconvenience of the Younger Dryas, we have been living the good life in the warmth of an interglacial that has endured – depending on where we start counting – for longer than average.

So might the greenhouse-effect-enhancing gases we are pouring into the atmosphere counter a cooling trend rather than exacerbate a warming swing? No doubt about it: the numerous cycles – solar, orbital, atmospheric, oceanic – that generate nature's environmental seesaws continue even as humanity has become a major factor in the process through massive modification of the planetary atmosphere. But supercomputer models and IPCC projections notwithstanding, no one knows the proportional contribution to the current phase of climate change from natural and human sources. Contrary to what some scientists are asserting, we do *not* know with any satisfactory level of confidence what form climate change would be taking today in the absence of human interference. What *is* clear is that humans have become an additional factor driving climate change, and that reducing the rate of pollution of the atmosphere should have priority as a public health as well as environmental matter. But don't expect a reward in the form of "stopping climate change." Ice ages will continue to come and go. Glaciers will wax and wane. Sea levels will fall and rise. Species, cultures, and civilizations will flourish and fail. Nature's power will prevail.

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