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> warming a demonstration is required that the 20th Century actually was unusually warm, and that the 19th Century was normal. Were they?

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To find the answer, we must go back several centuries to a period when the amount of greenhouse gases emitted from human activities was minimal. At that time, the instrumentally measured record of global temperature change was insufficient to detail climate's natural fluctuations, as the record dates only to the mid-19th Century.

Nature's record, however, goes back much further.

What makes up that record? It is natural indicators -- or proxies -- of climate information derived from glaciers, boreholes, coral, tree growth, sediments of pollen, insects or sea organisms, river effluvia, dune migration, stalactites and stalagmites, plus human documentary evidence such as weather diaries or crop accounts.

The technique of studying proxies isn't easy. There are many differences among proxies, so averaging across many proxies remains tricky. Another difficulty is that no one type of proxy is widely available to make a meaningful global average.

Because of these limitations, proxies are best viewed as records of local climate, with each accounted for in the context of its limits and uncertainties -- in time, geographical extent and climate sensitivity.

Nonetheless, despite the problems, there is a wealth of climate information from proxies that can now be culled using modern technology to provide a history of climate at many locations worldwide.

And a recent review (http://cfa-www.harvard.edu/press/pr0310.html) by a team from Harvard University, of more than 240 scientific articles by over 1,000 researchers using the various proxy data shows that the climate in most locations was not extreme or unusual during the 20th Century. Instead, the warmest, or most extreme, climate for those locations occurred in the Medieval Warm Period, between the 9th and 14th centuries.

That period of extreme climate -- long before the air's increase in greenhouse gas concentration from human activities -- must have natural explanations. Whatever they are, the results of the warming, as far as man was concerned, in most cases appear to have been more beneficial than dangerous. Vikings made their way to Greenland and Newfoundland in that period. And England had productive vineyards.

H.H. Lamb, the founder of the climatic research unit at East Anglia University, found that England's climate was warm enough in the 12th and 13th centuries to support more than 50 vineyards, signifying that May frosts were rare. But natural swings in climate ended that environment, beginning with a period known as the Little Ice Age, lasting about from 1300 to 1900 C.E., during which Europe had more acute winters. The intensity of the Little Ice Age reached its peak from 1550 to 1700, bringing crop failures, disease and death. Many died of famine in Scotland during crop failures in seven of eight years at the end of the 18th Century.

That the last millennium has seen periods warmer than the 20th Century in many parts of the world where there is information means that the 20th Century was not unusual. Meanwhile, the 19th Century, where thermometer records begin, seems to have been the tail of an unusual cold period that had persisted for some centuries, perhaps as far back as the 14th Century in some areas. It was not so normal.

The scientific history drawn from nature and man's observations over the last millennium suggests that a strong trend of human-induced warming does not exist. The scientific facts indicate that costly policies to combat global warming are unlikely to mitigate any of climate's everpresent natural risks, but they could reduce society's economic ability to cope with them.

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