The Little Ice Age

How Climate made History 1300-1850

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Montesquie famously argued that climate made history, or rather that the nature of cultures were determined by climactic conditions. Generally, however, historians have been rather disdainful of attributing any significance to extra-human factors on human history, a particularly well-articulated objection being formulated by Coolingwood, disregarding nature altogether, only counting the human response to nature as being a legitimate explanation. With due regard to Collingwood this assertion may strike many readers as hair-splitting. Yet famines and exceptional weather are part at least of the chronicle of history, and in elementary school we were told about all the successive famines that ravaged Sweden until potatoes became the established staple in the beginning of the 19th century. And we were told that the winter on 1708/09 was the most severe that had hit the Ukraine in two hundred years or so, and that was why the Swedish army essentially froze to death and was consequently routed at Poltava in the spring, which meant the loss of its status as a great military player in European politics, and the subsequent replacement by Russia. As a school-boy one naturally indulged in counterfactual speculation of 'if it was not for..'. Of course the emergence of Russia as a great power was inevitable, giving its huge population, and the direction such a one was given, when internal strife had been suppressed. Maybe it would not have happened in 1709, maybe five years later, at the most ten years ahead. What difference did it make. So indeed the consequences of the cold winter was not as momentous as one may be tempted to assume.

However, in recent years, extra-human factors shaping history have become far more acceptable, especially when it comes to climate, pioneered by the late H.Lamb. Fagan, an archeologist, follows in his footsteps. While Lamb was scientific in his approach, marshaling a wealth of evidence and approaches, littering his text with tables and graphs, Fagan's ambition is more to be popular and present a chronology of the events with human touches. The problem is that the history of weather is even more than the history of human affairs a 'one damned thing after another'. Hot summers follow on cold, sometimes many in a row. There may be trends over many years, only to have them broken unexpectedly. When those events are merely narrated, they become very confusing, and the reader is often at a loss at what century he happens to be in (a confusion occasionally aggravated by typos of the dates). How much easier would it not be to have a more direct connection between the graphs and the texts, showing how the dips into the graphs actually have momentous human consequences.

Now there are some general meteorological factors that drive the weather, namely the positions of high and low pressures in the North Atlantic, referred to as the North Atlantic Oscillation. Depending on relative strengths, we have either winds from the west, which are warm and moist and cause clement weather, often marred by much rain. Or we

have northern winds coming from the east bringing cold weather. Either extreme is bad. During the Viking Age the weather was generally quite mild, with sea ice retreating quite far north during the summer, allowing regular trips not only to Iceland, but even beyond to Greenland, and as it would later transpire to present day Labrador and New Foundland. In fact colonies were established on the western part of Greenland, and although they never flourished, they manage to survive for a few centuries, until the climate became too demanding. This story has also been told later, and at much greater detail by Diamond, showing how the living space of the Norse settlers became more and more curtailed until they simple starved to death. Had they not been quite as set on traditional ways, but learned from the surrounding Inuits, their descendants may at least have survived (as some very well may have although it might statistically be unlikely) if they might have become more and more Eskimo. As Fagan remarks, seals were readily available, but that did not seem to be a diet, let alone a staple one. By the 14th century it became colder and the Greenland colonies became isolated, it being impossible for several years in a row to get to Greenland.

But that was at the very periphery of Europe, more interesting things happened in Europe itself, but now there is the problem of recalling the various climactic events and their human tolls. There were often big floods, especially a giant one in the Dutch lowlands, creating the present day Zuider-Zee, which is only partially being reclaimed. Bad weather, be it too cold or too wet resulted in famines. Famines being predominantly local phenomena, they can be alleviated by more successful harvests at some distance, but if communication is bad or non-existant, that is no option. By the 19th century famines were more or less gone in Europe, although the cold weather persisted for the first half of the century. This was the result of many factors. Of course improved communication being one of them, but also improved farming methods, and finally a diversification of crops, especially the introduction of the potato, already alluded to above. For most of the period, until the mid 18th century or so, farming methods were medival in character, largely because farming was mostly on a strictly subsistence level, and when your head is barely above water you are far less willing to experiment. Innovation in farming started in the Low Countries, and then spread to England, while France proved very resistant and primitive for a long time, resisting the potato and clinging onto cereals as the main staple. This steady agricultural improvement also went with consolidation of small land parcels into bigger ones, allowing a much more efficient tilling of the ground. In fact this is one of the unsung revolutions of human history, which would transform the character of the land and ultimately lead to urbanization. Included in farming techniques one should also count new crops. The discovery of the New World (a term which in recent decades of globalization has come in more and more disuse) confronted the European with a whole hoist of alternative food-stuff, some far more efficient than previous ones, the potato being the supreme example. Still it did not make the land immune to the vagaries of weather. In addition to the usual meteorological explanations, there are also freak causes, such as major vulcanic eruptions, spewing huge amounts of ash into the atmosphere, effectively blocking out light. Hunyaputina in 1600 was an awesome one, as well as Tambora in 1816 which caused the year without summer all over the northern hemisphere. Every month of the year seeing at least some snow. The effect on food production was devastating. The 19th century

also saw some of the worst famines of the period, even if it was reduced to just Ireland. On that proverbially green and lush island, potatoes had early on become an accepted food, and even the paupers appeared well-fed and healthy according to contemporary visitors. However, it had become so popular as to taking over almost completely thus becoming a virtual mono-culture. Such are very susceptible to disease, and that what happened to the Irish potato, not only one year, but several years in a row. Society can usually handle one year of bad harvests, there being enough cushion, but two is a far more severe strain, and three spells disaster. Ireland was up for a disaster, its relatively high population of 8 million people in the mid 19th century dropped to five, partly because of emigration but also because of literally millions starving to death. The population of Ireland did not climb to pre-catastrophic levels until the 1960's.

When you look at temperature curves, they vary wildly on a local scale, but less so as you average over longer and longer time scales. This is to some extent confusing. If the average temperature rises with one degree Celsius say, what a big deal. You experience far more dramatic temperature gradients in a single day. You also experience them moving across the surface of the earth, and in most places you would actually chose to go, growth is healthy, regardless of temperature. But of course averages count for much more, the sustained effort having far more effect than a few random spectacular ones. A fraction of a degree has large effects on the length of the growing season, which obviously matters a lot. Thus if too constrained many crops cannot grow at all, one sensitive example being the grape, whose geographical fluctations of its northern limits illustrate much of changing climate. Thus the depressed temperatures of the period caused a lot of stress on human societies and forced them to adjust. Great stress, even if only involving modest changes of average temperatures. Glaciers are another obvious indicator. At a critical temperature, very little changes will determine whether the melting outstrips accumulation or not, and consequently whether the glaciers will advance or not. A long sustained period of subcritical temperature, even if not very low will result in a steady marked increase of glaciers. It is being speculated that what triggers an Ice Age is not necessarily very cold winters as much as cool summers. Cool summers makes for subcritical temperatures to extend for a much longer part of the year and over larger areas than hot summers, even if the winters are cold.

Now accurate temperature recordings are only available for the past two-hundred and fifty years, and if so spottily in the beginning. The historical record as such gives very little hard data, what you find are descriptions of weather and not measurements, the former being quite subjective and thus not seldom misleading. In order to get at more objective data, you need to be clever, and that is what you expect of an archival historian, Le Roy Ladurie being an often quoted example. Here Collingwood, already referred to above, comes to the fore. By interpreting evidence cleverly, we can actually squeeze out of it a lot of information. This is the forensic approach, particularly appropriate for the archeologist, who is not confining himself to the library and old written documents, but gradually merges with the paleontologist and the geologist. Dendrochronology being the more or less ultimate approach, the calibration of which has taken a lot of time and effort. It gives the most accurate readings, and through it variations of the prevalence of C14 can be measured, which has strong implications on radio-carbon dating. Another standard

approach is the sampling of ice-cores, be it in Greenland or Antarctica, those provide data of atmospheric conditions which go far beyond history, and hence the proper domain of this book.

Finally what can we expect? The worries about global warning, although such whistles have been blown before, did not really reach the consciousness of the public and politicians until the end of the 80's. Before that worries about nuclear winters or sudden transformations to ice ages intermittently caught the public imagination. The book written back in 2000, when the issue, although very much in the front had not quite reached the pitch it has now, there was still a message to be conveyed, namely that rather small changes in average temperatures could have rather extreme effects, as the history of climactic stress of the past five hundred years or so illustrated. And more importantly, the changes predicted would be on an even larger magnitude, and the proportionally stronger stress might challenge the power of modern technology. Maybe even, the greenhouse effect could go haywire, after a precarious balance has been tipped irreversibly.

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