

Extremwetter während des Maunder-Minimums

geschrieben von Chris Frey | 16. Mai 2022

Paul Homewood, [NOT A LOT OF PEOPLE KNOW THAT](#)

Der BBC zufolge hat die globale Erwärmung unser Wetter extremer gemacht.

Vielleicht sollte man dort mal einen Blick auf das Wetter während des Maunder-Minimums werfen:

Extremwetter während des Maunder-Minimums (ca. 1645 bis 1715)

Die Region rund um das östliche Mittelmeer (das Osmanische Reich) war während des Maunder-Minimums stark von ungünstigen klimatischen Bedingungen betroffen.

Die meisten Gebiete litten in den Jahren 1640, 1650 und 1670 unter Dürre und Pest, während der Winter von 1684 der feuchteste war, der in den letzten fünf Jahrhunderten im östlichen Mittelmeerraum aufgezeichnet wurde, und die Winter der späteren 1680er Jahre waren mindestens 3° C kälter als heute.

Im Jahr 1687 berichtete ein Chronist in Istanbul: „Dieser Winter war so streng, wie man es seit langer Zeit nicht mehr erlebt hatte. Fünfzig Tage lang waren die Straßen gesperrt, und die Menschen konnten nicht ins Freie gehen. In den Städten und Dörfern begrub der Schnee viele Häuser unter sich. Am Goldenen Horn [wichtige städtische Wasserstraße und Hauptzufluss des Bosphorus in Istanbul] lag der Schnee ‚höher als das Gesicht‘“.

Im folgenden Jahr zerstörten Überschwemmungen die Ernten in der Gegend von Edirne [nahe der türkischen Grenzen zu Griechenland und Bulgarien] und ruinierten die Ländereien, die normalerweise die kaiserliche Hauptstadt mit Lebensmitteln versorgten. In den 1640er und 1650er Jahren wurde das britische Empire von einem Bürgerkrieg heimgesucht.

Dieser Krieg und die Auswirkungen einer Reihe von Missernten, die zu Hungersnöten führten, sowie Pestepidemien töteten in England, Schottland und Wales etwa eine Viertelmillion Menschen, das sind 7 % der Bevölkerung.

Allein in Irland ging die Bevölkerung um 20 % zurück.

Im Jahr 1655 wurde festgehalten, dass „man zwanzig oder dreißig Meilen [in Irland] zurücklegen konnte, ohne ein lebendes Wesen zu sehen“, mit Ausnahme von „sehr alten Männern mit Frauen und Kindern“, deren Haut „wegen der schrecklichen Hungersnot schwarz wie ein Ofen“ war.

In Schottland kam es zu einer Hungersnot, „wie sie in diesem Königreich noch nie vorgekommen war, seit es eine Nation ist“. Von Neufundland [Kanada] bis Patagonien [dem südlichen Ende Südamerikas] erlebten die Amerikaner in den 1640er und 1660er Jahren deutlich kältere Winter und kühlere Sommer.

Das Jahr 1675, ein „Jahr ohne Sommer“, bleibt das zweitkälteste, das in Nordamerika in den letzten sechs Jahrhunderten aufgezeichnet worden war.

Alle erhaltenen Ernteaufzeichnungen zeigen eine Dürre in den 1640er und 1650er Jahren. In den kanadischen Rocky Mountains herrschte von 1641 bis 1653 eine schwere und langanhaltende Dürre. In Indonesien herrschte zwischen 1643 und 1671 die längste Dürre der letzten vier Jahrhunderte, mit intensiven Episoden zwischen 1659 und 1664. Im Jahr 1645 n. Chr. war der Sommer in England übermäßig heiß und trocken. Die Luft war sehr warm und so ansteckend, dass Hunde, Katzen, Mäuse und Ratten starben und mehrere Vögel beim Flug über die Stadt tot umfielen.

Die Pestepidemie war sehr heftig. In den Jahren 1645 und 1646 gab es in Russland eine Dürre und eine Heuschreckenplage; 1647 und 1648 kam es im Süden zu frühen Frösten und Missernten, die zu einer weit verbreiteten Lebensmittelknappheit führten. Im Jahr 1645 wurde Shanghai in China von einem großen Sturm heimgesucht, der dazu führte, dass das Meer die Deiche brach, Salzwasser über das Land verteilte und die Reisernte vernichtete. Im Jahr 1645 zerstörten Regenfälle auf Kreta, die intensiver waren als alles, was im zwanzigsten Jahrhundert aufgezeichnet wurde, Ernten und Gebäude. Ab September 1645 regnete es auf Sizilien ein Jahr lang fast ununterbrochen, was zunächst die Winterernte zerstörte und dann den Ertrag der Sommerernte drastisch reduzierte.

Im August 1646 stiegen die Weizenpreise höher als je zuvor.

Im Herbst 1646 kam es dann zu einer großen Dürre, die den ganzen Winter über und bis in das darauffolgende Frühjahr 1647 anhielt und die eine weltweite Katastrophe zu verursachen schien.

1646 wurde Holland und Dänemark von einem großen Sturm heimgesucht, dessen Überschwemmungen 110.000 Menschen ertränkten.

Bei Dordrecht in den Niederlanden und in der Umgebung brach das Meer ein und ertränkte 10.000 Menschen. Bei Dullar in Friesland und Seeland ertränkte es 100.000 Menschen und 300 Dörfer. In der Ukraine brachte der grausame Winter 1645-46 starken Schnee und Frost.

Diese wichen täglichen Regenfällen, die so heftig waren, dass die Straßen unpassierbar wurden.

Dies zerstörte die Ernte und machte es den Kosakengemeinden am unteren Dnjepr unmöglich, sich zu ernähren. Sintflutartige Regenfälle im Jahr 1646 und eine Dürre im Jahr 1647 zerstörten die Ernteüberschüsse, auf die Istanbul (die Hauptstadt des Osmanischen Reiches) angewiesen war,

und führten zu einer Nahrungsmittelknappheit. Die kaiserliche Mogul-Armee [von Indien] fiel in Afghanistan ein, aber der Winter 1646-47 brachte eine so starke Kälte, dass die Mogul-Garnisonen „sich in den Feuern verbrannten, die sie zum Wärmen anzündeten, und niemand verließ seine Häuser aus Angst vor dem Erfrieren“. Im Jahr 1646 zerstörte eine Heuschreckenplage die Ernten in Moldawien.

„Kein Blatt, kein Grashalm, kein Heu, keine Ernte, nichts blieb übrig“.

Die gleiche Katastrophe vernichtete die nächsten beiden Ernten. Auf der Krim hungerten die Menschen 1647.

In einer Chronik heißt es: „Letztes Jahr gab es keine Ernte, und jetzt sterben die Rinder, Schafe und Kühe“. In England „ruinierte schlechtes Wetter die Ernte von Mais [Getreide] und Heu fünf Jahre lang vom Herbst 1646 an“. In den Jahren 1647 und 1648 war das Wetter in England die meiste Zeit über sehr kalt, feucht und regnerisch.

Das Vieh verendete überall durch Mehltau.

Der Weizenpreis erreichte in den Jahren 1648 und 1649 (über den 100-jährigen Zeitraum von 1646-1745) seinen Höchststand, was auf eine Knappheit hindeutet. Auf der Iberischen Halbinsel brachte das Jahr 1646 eine katastrophale Ernte.

Im Mai 1647, gerade als die neue Getreideernte sicher schien, wurde es in ganz Andalusien, in Südspanien, kalt, schlimmer als am kältesten Januartag“.

Starke Fröste töteten die Getreideähren und führten zur schlechtesten Ernte des Jahrhunderts. In Frankreich kam es 1647 zu einer Missernte, so dass sowohl in der Hauptstadt als auch am Hof die Lebensmittel knapp wurden. In einigen Regionen der Niederländischen Republik regnete es zwischen April und November 1648 jeden Tag, so dass das Heu und das Getreide auf den Feldern verfaulten.

Dann folgten sechs Monate Frost und Schnee, in denen die Kanäle zufroren und der gesamte Binnenschiffsverkehr in den Niederlanden zum Erliegen kam.

Viele beklagten sich, dass der Winter sechs Monate lang dauerte.

Auch der Sommer 1649 war ungewöhnlich nass, und der Sommer 1650 ungewöhnlich kalt.

Zwischen 1648 und 1651 erreichten die Getreidepreise in der Republik den höchsten Stand seit einem Jahrhundert. Das französische Königreich litt mehrere Jahre lang unter extremen klimatischen Bedingungen, die zu Ernteaufschlägen und Hungersnöten führten.

Diese Probleme wurden durch eine übermäßige Besteuerung verschärft, die

in den Jahren 1648 bis 1653 zur Fronde-Revolution in Frankreich führte.

Etwa eine Million Franzosen und Französinen starben direkt oder indirekt infolge der Fronde.

Als am 27. August 1648 die Sonne aufging, „sah man Kinder im Alter von fünf und sechs Jahren mit Dolchen in den Händen und Mütter, die sie bewaffneten“. Schlechtes Wetter ruinierte die Ernte des Jahres 1648 in ganz Süditalien.

Der Preis für Getreide in Neapel vervierfachte sich.

Beamte berichteten, dass das Volk murrte: „Es war immer besser, durch das Schwert zu sterben als an Hunger zu sterben“. In Yucatán in Mexiko brachten schwere Regenfälle ab 1648 eine Gelbfieberplage in die Region.

Auf die Regenfälle folgte „eine so schwere und außergewöhnliche Dürre, dass sie das Land unfruchtbar machte und eine so große Hitze erzeugte“, dass in ganz Yucatán Waldbrände wüteten, die alle von der Dürre übrig gebliebenen Ernten zerstörten.

Der örtliche Chronist Diego López Cogolludo behauptete, dass zwischen 1648 und 1656 „fast die Hälfte der Indianer an den Folgen der Pest, des Hungers und der Pocken zugrunde ging“.

Während des Winters 1648-49 frohr die Themse in London, England, zu. Im Jahr 1649 kam es in England und Frankreich zu großen Überschwemmungen.

In den Jahren 1649 und 1650 kam es in Schottland und Nordengland aufgrund von Regenfällen und Kriegen zu einer Hungersnot.

Es folgte die Pest in Irland und England.

In den Jahren 1650 und 1651 herrschte in ganz Irland eine Hungersnot. In Schottland herrschte seit 1636 die schlimmste anhaltende Dürre seit einem Jahrtausend.

Diese kulminierte in starkem Schneefall, gefolgt von einer Getreideernte von „geringem Umfang“ im Sommer 1649, so dass die Preise für Lebensmittel „aller Art höher waren als je zuvor, woran sich ein Lebender erinnern kann“. Die Pestepidemie, die sich im Jahrzehnt nach 1649 in Südeuropa ausbreitete, tötete die Hälfte der Einwohner von Sevilla, Barcelona, Neapel und anderen ähnlichen Städten. Im Jahr 1649 gab es in Deutschland 226 Tage Regen oder Schnee, gefolgt von einem sechsmonatigen Winter. Der Winter 1649-50 war der kälteste, der in Nord- und Ostchina aufgezeichnet wurde. In Russland zeigen Baumring-, Pollen- und Torflagerdaten, dass die Frühlinge, Herbst- und Winter zwischen 1650 und 1680 zu den kältesten der letzten 500 Jahre gehörten.

Wiederholt fielen die Ernten aus oder erbrachten nur wenig Nahrung. Rekonstruierte Baumringsequenzen von der Insel Tasmanien zeigten eine

Reihe von schlechten Wachstumsperioden in der Mitte und am Ende des 17. Jahrhunderts, eine Periode, die die „längste kühle Periode der letzten 700 Jahre“ war. In Schweden hatte eine lang anhaltende Kälteperiode die Ernteerträge und den Handel beeinträchtigt, und die Ernte von 1650 „war die schlechteste, die Schweden seit fünfzig Jahren kannte oder für fast fünfzig weitere Jahre kennen sollte“, und im März bekämpften sich die Stockholmer Bäcker vor den Stadttoren, um sich etwas von dem knappen Mehl zu sichern. In China bildeten die Winter zwischen 1650 und 1680 die kälteste Periode, die in den Tälern des Yangzi und des Gelben Flusses in den letzten zwei Jahrtausenden verzeichnet wurde. In Südchina meldeten in den 1650er Jahren siebzehn Landkreise in der Provinz Guangdong Frost oder Schnee.

Dies war die höchste Zahl seit zwei Jahrhunderten. Im Jahr 1650 herrschten in Italien übermäßige Hitze und Dürre.

Nach der Ernte folgten auf die sengende Hitze sehr starke Regenfälle, auf die wiederum äußerst strenge Kälte folgte. In Frankreich zeichnete sich dieses Jahr durch eine große Getreideknappheit aus; der Preis war dreimal so hoch wie in den fünf Jahren zuvor. Im Jahr 1650 erreichte der Nil in Ägypten bei seinem jährlichen Hochwasser den niedrigsten Stand des Jahrhunderts.

Ägypten ist eine Wüste, durch die ein Fluss fließt“, so Alan Mikhail; ein schlechtes Nilhochwasser verringerte die Ernteerträge der gesamten Provinz drastisch.

In dieser Zeit war Ägypten die Kornkammer des Osmanischen Reiches. Die Unwetter des Jahres 1651 verursachten in Frankreich ein großes Hochwasserjahr. Alle Flüsse traten über ihre Ufer. In der Provence stieg die Durance am 8. September bis vor die Tore von Avignon. Im November trat die Isère in Grenoble über die Ufer, überflutete Brücken und fünfzig Häuser, ertränkte fünfzehnhundert Tiere auf dem Land und dreihundert in der Stadt. Die Flut hinterließ drei oder vier Fuß Sand in den Straßen. Das Wasser stieg, wie man sagt, mehr als zwanzig Fuß über seinen üblichen Stand. 1651 fiel in den Niederlanden so viel Schnee, dass das Staatsbegräbnis von Stadthalter Wilhelm II. verschoben werden musste, weil zahlreiche Trauergäste Den Haag nicht erreichen konnten.

Im Jahr 1651 wurde im Languedoc und im Roussillon, dem mediterranen Grenzgebiet zwischen Frankreich und Spanien, die längste aufgezeichnete Dürreperiode verzeichnet, die 360 Tage andauerte. Im Jahr 1652 herrschte in Schottland eine Dürre. Es war sehr warm, und der Sommer war der trockenste, der je in Schottland verzeichnet wurde.

Auch in England und Dänemark war es sehr heiß und trocken. In England gab es in den Jahren 1651-54 glühend heiße, trockene Sommer und trockene Jahre. Im Juli 1653 war es in Polen so brütend heiß, dass im Regiment der Fußsoldaten, der Garde des Königs, die meisten von ihnen barfuß auf Sand marschierten, mehr als 100 völlig behindert zusammenbrachen

[Hitzschlag], von denen ein Dutzend ohne jede andere Krankheit sofort starb. 1653 verursachte eine Dürre in der Nähe von Shanghai, China, eine Hungersnot. In den Jahren 1654-57 verursachte eine Beulenpest-Epidemie in Russland eine große Entvölkerung. In den Jahren 1654-56 herrschte in Südfrankreich eine große Dürre. Es regnete nur sehr selten. Im Winter 1654-55 war es in Weißrussland auf dem Balkan so kalt, dass die Wein- und Biervorräte auf den Schlitten in einer Nacht einfroren, obwohl sie mit Stroh isoliert waren.

Die Soldaten mussten die Gefäße zerbrechen und die Weinstücke aus dem Eis in Kesseln über einem Feuer auftauen, um sie trinken zu können. Im Jahr 1655 waren die Seen Mau und Tien in China im Winter zugefroren. Mehrere Tage lang konnten die Menschen über sie laufen. Dieser Winter 1655-56 war in Frankreich und Deutschland sehr streng. In Frankreich frohr die Seine zu.

In Deutschland war die Kälte so groß, dass man in Wismar (Mecklenburg-Schwerin) mit einem beladenen vierspännigen Wagen auf die zugefrorene Ostsee gelangen und eine Strecke von 5-6 deutschen Meilen zurücklegen konnte, was seit vielen Jahren nicht mehr der Fall war. Auf dem Lande waren die Brunnen bis auf den Grund gefroren. Auf den Straßen in Böhmen [der heutigen westlichen Tschechischen Republik] wurden mehrere Menschen erfroren aufgefunden.

In Schottland war es sehr kalt. In den Jahren 1656 und 1657 kam es in Rom, Italien, zu Überschwemmungen und einer Hungersnot.

Im Juli gab es einen großen Regensturm, der die Donau in Europa über die Ufer treten ließ, Brücken und Mühlen einriß und viele Menschen und Vieh ertrinken ließ.

Sechzehn Städte und Dörfer wurden weggeschwemmt. Zwischen 1657 und 1661 erlebte England 5 Missernten in Folge. Der Winter 1657-58 war in Europa sehr streng.

Die Buchten und Meeresarme in Nordeuropa froren zu. Karl X. von Schweden überquerte die Meerenge nach Dänemark mit seiner gesamten Armee, einschließlich der Artillerie, des Gepäcks und der Versorgungszüge. Im Januar überquerte sein Heer den zugefrorenen Kleinen Belt zu Fuß, eroberte die Insel Fünen und setzte sich dort fest. Anschließend reiste er über den zugefrorenen Großen Belt und überquerte die Inseln Langeland, Lolland und Falster, und schließlich erreichte sein Heer am 11. Februar Seeland. Am 27. Februar 1658 herrschte in Rom, Italien, starker Schneefall. Die Flüsse Italiens froren tief genug ein, um die schwersten Karren zu tragen. Der kalte Winter in Frankreich zerstörte die Olivenbäume und wurde von extremen Schneefällen begleitet.

Die Seine in Frankreich war bereits in den ersten Januartagen vollständig zugefroren. Nach dem bedeutenden Winter 1657-58 wurde die Schneeschmelze in Frankreich durch sintflutartige Regenfälle verstärkt, und viele Flüsse traten über die Ufer, darunter auch die Seine, die

Paris zum dritten Mal innerhalb eines Jahrzehnts überflutete.

Da die Bauern nicht säen konnten, fiel die folgende Ernte sehr schlecht aus. Der Winter 1657-58 war auch an der Atlantikküste der USA sehr streng.

Die Bucht von Massachusetts frohr zu, und der Delaware River frohr so stark zu, dass Rehe über ihn liefen.

Der Winter in England war streng.

Die Krähenfüße waren an ihrer Beute festgefroren; Eisinseln schlossen Fische und Geflügel ein, die erfroren waren, nebst einigen Menschen in ihren Booten. In Europa ritten die Menschen mit ihren Pferden auf dem Eis über die Donau bei Wien (Österreich), über den Main bei Frankfurt (Deutschland) und über den Rhein bei Straßburg (Frankreich), während der Schiffsverkehr auf den Flüssen und Kanälen in den Niederlanden durch Schlitten ersetzt wurde.

Der Kanal zwischen Haarlem und Leiden in den Niederlanden blieb 63 Tage lang zugefroren.

Die Ostsee frohr so stark zu, dass ein Pferdewagen problemlos von der Weichselmündung bei Danzig (Polen) bis zur Halbinsel Hela fahren konnte. In England hielten im Frühjahr 1658 der Nordwind und die Kälte so hart und lange an, dass die Landwirte die Hoffnung verloren, dass ihr Getreide wachsen oder reifen würde. In Modena in Norditalien herrschten übermäßige Hitze und Dürre. In Abdera in Griechenland herrschte ein übermäßig heißer Sommer. In Dänemark und Kopenhagen herrschten Trockenheit und übermäßige Hitze.

Im September wurde England von einem starken Sturm heimgesucht, der große Zerstörungen an Land und auf acht Fregatten und Linienschiffen anrichtete, und zweitausend Offiziere und Seeleute kamen ums Leben. In den Jahren 1658-60 führte ein katastrophaler Monsunausfall zu einer weit verbreiteten Hungersnot in Indien, insbesondere in Gujarat, dessen Bevölkerung in hohem Maße von importierten Lebensmitteln abhängig war.

Im Jahr 1659 herrschte in Südostindien eine „so große Hungersnot“, dass „die Menschen täglich aus Mangel an Nahrung starben“, während in Gujarat „die Hungersnot und die Pest“ so groß wurden, dass sie „den größten Teil des Volkes hinweggefegt haben, und die, die übrig geblieben sind, sind wenige“.

Die Dürre hielt in Gujarat bis 1660 an, und die Hungersnot wütete, so dass „die Lebenden kaum in der Lage waren, die Toten zu begraben“. Die Ägäis- und Schwarzmeerregion erlebte 1659 die schlimmste Dürre des letzten Jahrtausends, gefolgt von einem so strengen Winter, dass die Donau bei Giurgiu (200 Meilen landeinwärts vom Schwarzen Meer) in einer einzigen Nacht so stark zufror, dass die osmanische Armee über das Eis nach Rumänien marschierte und „alle Dörfer verwüstete und nirgendwo

einen Grashalm oder eine Seele am Leben ließ“.

Aufgrund der Hungersnot waren viele gezwungen, ihre Kinder zu verkaufen.

Auch in Siebenbürgen gab es magere Ernten, was zu einer großen Hungersnot führte.

Ein Beamter vermerkte in seinem Tagebuch, dass Siebenbürgen dank des Krieges und des Wetters „noch nie ein solches Elend erlebt hat wie in diesem letzten Jahr [1660]“. Der kalte Winter von 1659-60 war in England, Frankreich und Italien sehr streng.

Er vernichtete die Olivenbäume fast vollständig. Zwischen 1660 und 1680 suchten mehr Taifune den Süden Chinas in der Provinz Guangdong heim als zu irgendeinem anderen Zeitpunkt in der aufgezeichneten Geschichte. Ein katastrophal nasser Winter und Frühling im Jahr 1661 löste in Frankreich eine weitere Hungersnot aus, und der Preis für Brot in Paris verdreifachte sich.

König Ludwig XIV. kaufte Getreide in Aquitanien, der Bretagne und an der Ostsee auf und brachte es in die Hauptstadt. 1661 kam es im Nordwesten Indiens und im Osten Pakistans zu einer schweren Dürre, die zu einer Hungersnot führte.

Das Leben wurde für einen Laib angeboten, aber niemand interessierte sich dafür; der Rang sollte für einen Kuchen verkauft werden, aber niemand interessierte sich dafür. Lange Zeit wurde Hundefleisch für Ziegenfleisch verkauft, und die zerstampften Knochen der Toten wurden mit Mehl vermischt und verkauft. Die Not erreichte schließlich ein solches Ausmaß, dass die Menschen begannen, sich gegenseitig zu verschlingen, und das Fleisch eines Sohnes wurde seiner [Sohnes] Liebe vorgezogen. Die Zahl der Sterbenden führte zu Behinderungen auf den Straßen. Am 18. Februar 1661 wurde England von einem großen und furchtbaren Sturm heimgesucht. Der Schaden wurde auf etwas weniger als 2 Millionen [240 Millionen Pfund in heutiger Währung unter Verwendung des Verbraucherpreisindex] geschätzt. Im Jahr 1662 herrschte in Shanghai, China, eine große Dürre.

Dies führte zu einer schlechten Ernte, und die Lebensmittel waren sehr knapp. Der Winter 1662-63 war in Frankreich und England sehr kalt.

Die Seine in Frankreich und die Themse in England froren zu. Bei diesem Frost wurden Schlittschuhe aus Holland nach England eingeführt. Am 1. Dezember wurde der König Zeuge einer Vorführung von Schlittschuhen. Im Jahr 1663 gab es in England einen übermäßig nassen Herbst und infolgedessen ein großes Viehsterben.

Am 28. August gab es sehr starken Frost.

Auch in Ostfrankreich herrschte im Sommer kaltes und regnerisches Wetter. Im Jahr 1663 gab es in den nordwestlichen Regionen des Iran

sechs Monate lang weder Regen noch Schnee, so dass „die Brunnen austrockneten und die Ernte verdorrte“.

In Polen herrschte an mehreren Sommertagen in den Jahren 1664, 1666 und 1667 Frost. Der Winter 1664-65 war in England lang und kalt.

In Frankreich war er sehr kalt. In Belgien gab es sehr strenge Fröste und starke Schneefälle. Der Winter in Polen war so streng, dass die meisten Weine erfroren und mehrere Menschen ihre Gliedmaßen [durch schwere Erfrierungen] verloren und andere starben. 1665 kam es in England zu großen Überschwemmungen der Flüsse und zu Überschwemmungen durch das Meer.

In England herrschte eine große Seuche.

In London sollen 68.596 Menschen an der Pest gestorben sein.

...

Anmerkung des Übersetzers: In dieser Weise geht es nochmal so lang weiter. Allerdings geht alles in diesem Beitrag räumlich und zeitlich sehr durcheinander. Die Masse der beschriebenen Ereignisse deutet zwar darauf hin, dass es eine Häufung von Extremwetter gegeben haben muss, doch muss man dabei auch bedenken, dass der damaligen Bevölkerung nicht einmal ansatzweise die Hilfsmittel zur Verfügung standen, auf die wir uns heute so verlassen können.

Und: Es ist keineswegs nur von Kälte, sondern auch außerordentlichen Hitze- und Dürreperioden die Rede. Dies stützt die von KÄMPFE auf diesem Blog schon mehrfach beschriebenen Hinweise, dass Extremwetter in Kaltzeiten viel öfter vorkommt als in Warmzeiten. Das lässt sich meteorologisch auch leicht erklären, ist doch der Temperaturgegensatz zwischen niedrigen und hohen Breiten in Kaltzeiten viel größer mit der Folge intensiverer Wettervorgänge.

Aus all diesen Gründen wird auf die weitere Übersetzung dieses Beitrags verzichtet.

Bis hier übersetzt von [Christian Freuer](#) für das EIKE

Link des Beitrags:
<https://wattsupwiththat.com/2022/05/10/extreme-weather-during-the-maunder-minimum/>

Und hier der Rest des Beitrags ohne Übersetzung:

After an order to kill cats and dogs, it is said that 40,000 dogs and 200,000 cats were destroyed. The plague was very fatal at Derby. 'The country people refused to bring their commodities to the marketplace, depositing them outside town; then retired to a distance till the buyer had deposited his money in a vessel filled with vinegar. 'At Winchester,

the dead were carried out by cartloads at a time, and the plague was as bad as in London. In **1666**, there was a great drought in England.

In the moors between Yeovil and Bridgwater, the dried pasture showed the outline of trees beneath. They were dug up and there was hundreds of oaks as black as ebony [petrified wood]. In England, it was intensely hot and dry. The Great Fire of London occurred. [This was the largest fire that ever occurred in London. It began on 2 September **1666** and continued for four days, and consumed thirteen thousand houses, eight-six churches and public buildings. St. Paul's Cathedral was among the number. The buildings were all destroyed on 400 streets.] In **1666**, England was struck by massive storms that contain exceptionally large hail and tornadoes.

Some of the hailstones were a foot in circumference.

These storms occurred on 17 July and 13 October. On 14-15 August **1666**, a great Atlantic hurricane struck the islands of Guadeloupe, Martinique and other islands in the Caribbean causing approximately 2,000 deaths. All the vessels [17 sails] in the Saints [Barbados] were driven on shore. The whole of Lord Willoughby's fleet, only two were ever heard of afterwards. All the batteries (with walls of six feet thick) near the sea were destroyed; and guns, fourteen pounders, were washed away. In **1666**, there was a great drought in Shanghai, China. Spain suffered from harvest failures in **1665-1668** and **1677-1683**, a plague epidemic in **1676-1685**, and then more harvest failures in **1685-1688**. Between **1666** and **1679** in most if not all regions of China, 9 out of 14 summers were either cool or exceptionally cool, and a recent study of Chinese glaciers suggests a late seventeenth-century climate on average more than 1° C colder in the west and more than 2° C colder in the northwest than today. The winter of **1666-67** was very severe in the Netherlands producing extreme cold.

This occurred late in the winter season from 16 March to 1 April.

The seas near Amsterdam froze completely.

Several ships were stuck in the ice. During the winter of **1666-67**, Poland experienced 109 days of frost. In the years **1666** and the 3 years after, Iran experienced plagues, locusts that destroyed the harvest, and famines.

In Montbéliard, France in **1667** the summer was very cold and dry. There was not a single month throughout the year in which it had not frozen. On 1 September **1667**, a tremendous hurricane desolated the island of St. Kitts in the West Indies. All the houses and building on the island were blown down.

This is probably the same hurricane that moved up the Atlantic coast in the U.S. and struck in what is now Virginia on 6 September. Buried in the ruins were much goods and many people. Many lives were lost.

In **1668**, a small pox epidemic killed 1/9th the population of London, England. During the winter of **1669-70** it was intensely cold. The Little and Great Belts were frozen, and many people perished. [The Great Belt in Denmark (Danish: Storebælt) is a strait between the main Danish islands of Zealand (Sjælland) and Funen (Fyn). The Little Belt separates Fyn from Jylland.] The Danube River was frozen so hard that it carried people, horses and wagons. In Italy and France, there was severe cold. The extreme cold [in France] during January and February destroyed a large number of trees. In west-central Germany, the waters of the Rhine River froze at Koblenz, so that artistic craftsman exercised their several trades upon the ice (ice fair on the Rhine).

In Moldavia, in the summer of **1670**, 'Terrible floods, frequent showers and heavy rainfall day and night raged for three months on end, destroying all the best wheat, barley, oats, millet and all types of crop. Because they lie in water and are attacked by too much moisture, they neither ripen nor can bear seeds. Nor can the grasses and herbaceous seeds in hayfields grow, for frost and water; or, if they do, they cannot be harvested [because] the sun never warms or dries up the land.'

In Africa, according to a Turkish traveler in the **1670**'s, 'no one in Egypt used to know about wearing furs. There was no winter. But now we have severe winters and we have started wearing fur because of the cold.'

In **1671**, severe droughts struck many regions of China. In **1671**, excessive heat and drought destroyed the harvest in Sicily. The famine caused heavy mortality.

On 8 December **1671** there was a great snowfall in England. Then on 9-11 December, a storm of freezing rain struck England. It destroyed a great many trees and made the roads impassable. Many travelers were stranded. This was then followed by a heat wave where apple trees blossomed before Christmas.

The winter in France was severe and the cold lasted for three months. In May **1672**, the drought lowered the water in the l'Yssel [sometimes called Gelderse lJssel River in eastern Netherlands] and the Rhine River [in Germany]. The river was fordable on one arm of the river at several locations. This allowed the army of Louis XIV, to cross the river on June 5.

An epidemic of measles prevailed in London, England in that year.

And in Shanghai, China, a great drought struck the region. In France, the year **1672** saw the worst harvest in a decade due to a drought followed by torrential rains, and those of the two succeeding years were scarcely better. In **1673** in England the year was a cold unseasonably bad year, and a very late lean year.

Shanghai, China was struck by an unusual hailstorm. The individual hailstones weight 3 or 4 pounds.

The winter of **1673-74** was severe in the Netherlands. 'The Zuiderzee was completely frozen; 16 March we crossed it on foot, on horseback and sleigh on the ice between Stavoren and Enkhuizen.'

The winter was very cold in Poland.

In England, it snowed for 11 continuous days. In England, on 7-8 May **1674**, there was a great flood on the rivers Trent and Tame.

An epidemic of smallpox was very violent in London, England. It destroyed 1/8th of the people. In **1674**, a great storm (with lightning, thunder, large hail and tornadoes struck the Netherlands, France and Belgium causing extensive damage.

The Camargue [river delta] in France was covered by the floodwaters of the Rhône River in **1674**. In **1675**, much of the northern hemisphere experienced a 'year without a summer'. In November **1675**, a great storm struck the Netherlands.

The storm was so violent that it caused several breaches in the great dikes near Enchousen and others between Amsterdam and Haarlem. Forty-six vessels were cast away at Texel and almost all the men drowned. These breaches caused a great inundation, which caused much damage. Many people, cattle and houses were lost.

The winter of **1676-77** was extremely cold in northern France. The Seine River at Paris was frozen for 35 consecutive days. The river Meuse [Maas] was frozen from Christmas till 15 January and heavily laden wagons crossed over on the ice.

Around July **1678**, there were great floods in France. The River Garonne in one night swelled all at once so mightily, that all the bridges and mills above Toulouse were carried away. In the plains which were below the town, the inhabitants who built in places which by long experience they had found safe enough from any former inundation, were by this surprised, some were drowned, together with their cattle, others only saved themselves by climbing trees or getting to the tops of houses. Others who were looking after their cattle in the field were warned by the horrible noise and furious torrents of water and fled but could not escape without being overtaken. At the exact same time the two rivers of Adour and Cave, which fall from the Pyrénées Mountains, as well as some other little rivers of Gascoygne overflowed in a similar manner and cause the same devastation. New river channels formed in the mountains by the furious torrents, which tore up the trees, earth, and great rocks.

In 1679', drought struck many regions of China. The drought caused a scarcity in the vicinity of Shanghai, China. In 1679, another drought

struck Sicily. Grain prices again reached famine level.

In England in **1680** the summer was extremely hot and dry.

In Wrocław, Poland, there was great heat during the summer.

There was a great hailstorm in Europe where the hail was 1 foot deep.

There was a great flood in Londonderry, Ireland.

In the beginning of August, a hurricane struck Martinique and the Dominican Republic.

Twenty-five large French ships were lost, two English ships and several Spanish ships producing a great loss of life.

There was a great drought in the vicinity of Shanghai, China.

In Sahel in Africa, drought in the **1680**'s became so severe and so widespread that Lake Chad fell to its lowest level ever recorded.

The winter of **1680-81** was intensely cold in Europe including southern France and Italy. The Little and Great Belts in Denmark were frozen, and many people perished.

In England, the winter was long, severe and intensely cold. This year the cold was so severe as to split whole forests of oak trees.

The cold was so severe Provence, France that it killed the olive trees. The spring and summer of **1681** in England was extremely hot and dry.

The herbs and grasses were burned, and in the air, no trace of moisture could be detected.

An epidemic of smallpox was violent in London, England killing 1/8th of the inhabitants.

On 6 June **1682** a great storm struck Tortorici in the Valley of Dimana in Sicily and continued for 36 hours. Great torrents of water fell from the neighboring mountains with so great rapidity, that they carried down trees of extraordinary bulk, which demolished the walls

1624 butchers, barbers, coffee-men, and others, who were so frequented by the innumerable concourse of all degrees and qualities, that, by their own confession, they never met elsewhere the same advantages, every one being willing to say they did lay out such and such money on the river of Thames.

Almost daily about 40hackney coaches drove back and forth across the ice as if they were on dry land. A bullfight and a foxhunt were organized on the frozen river.

A great many shows and tricks to be seen. Large fires were made on the ice.

On 2 February, an ox was roasted whole and King Charles and the Queen ate part of it.

Nearly all the birds perished.

Many trees, plants and herbs were destroyed by the extreme cold.

Many oak trees split apart with a loud bang, like a musket shot.

Solid ice was reported extending for miles off the coasts of the southern North Sea (England, France and the Low Countries), causing severe problems for shipping and preventing the use of many harbors. Ice formed for a time between Dover (England) & Calais (France), with the two sides joined together.

All the French ports were closed for three or four weeks, the harbors being frozen over. Ice extended nearly 24 miles off the coast of the Netherlands.

The cold was very severe in northern Europe. The ice was 27 inches thick in the harbor of Copenhagen, Denmark. Almost all the rivers in Belgium and the Netherlands were cross-able with loaded wagons. An extraordinary amount of snow fell in southern France.

In **1684**, the drought in France was excessively severe. Jean-Dominique Cassini ranked the year **1684** among the warmest in an array spanning 82 years of great heat in Paris, France.

It was also equally hot and dry in England. In **1685**, there was an epidemic of smallpox in London, England, where 1/9th of the population died. In **1685-87**, a catastrophic monsoon failure produced a widespread famine in India, especially in Gujarat whose population relied heavily on imported food.

In Madras, parents gave away their children and adults sold themselves into slavery in order to avoid starvation. During the years **1686-89**, there was a great drought in Italy. In **1686**, a military engineer on campaign in Romania complained 'for three years now, I haven't seen a single drop of rain'.

Lakes and rivers dried up, and 'in the swampy soil, cracks were so deep that a standing man could not be seen ... I doubt if there is another example of such a terrible and lasting drought.' A strong hailstorm with hailstones weighting up to 1 pound each struck Lille, Belgium on 24 May **1686** causing great destruction.

In June, a flood came down from the mountains and nearly destroyed the towns of Kettlewell and Starbottom in England.

The water was the height of a church steeple. In **1687**, there was a great flood in Dublin, Ireland. The lower part of the city was underwater up to the first floor and boats plied in the streets.

There was also a great estuary flood in the River Severn in England. In the summer many of the rivers in England were flooded and many people drowned.

When the fruit ripened on the trees, great swarms of gnats and insects appeared. In **1688**, an epidemic fever struck Ireland and England.

A great typhoon struck Shanghai, China. The storm extended over 370 miles and caused great destruction of life and property in every direction.

The winter of **1688-89** was very severe in England and the river Thames was frozen. A frost fair was held on the river in London.

In Germany, the winter was severely cold with great falls of snow. In **1689**, there was a famine in Northern Ireland. 'The inhabitants glad to eat rats, tallow and hides.'

France experienced their driest years in 30 years.

Heavy rainfall caused a great flood in Norwich, England.

The long drought broke in Italy, when the country experienced great rains, which rendered the whole spring frightful and good for nothing.

A great hurricane struck the island of Nevis in the West Indies killing one half of the inhabitant.

Droughts struck many regions of China and as a result many wells, springs and rivers dried up.

Climatologists regard the extreme climate events and disastrous harvests during the **1690's**, with average temperatures 1.5° C below those of today, as the 'climax of the Little Ice Age'.

Sea temperatures around the Orkney Islands and Scandinavia in the **1690's** were 5° C colder than today. In **1690**, an awful snowstorm struck Scotland, which lasted thirteen days and nights. During that time nine-tenths of the sheep were frozen to death, and many shepherds lost their lives. In **1690** in Ireland, there was famine and disease. In Italy in **1690**, there was a famine from excessive rains.

Around the end of March, the heavens seemed to open their bosom and pour out their whole great reservoir of water. By one night's rain, all the country about Modena, Finlan, Ferrara, Mirandola [in Northern Italy] were laid under water, deluged like a Sea. These cities standing up like little islands. This rainy weather continued the whole spring and

summer, scarce one fair day. In the beginning of June, mildew appeared on the grain leading to its total destruction.

Nuts alone escaped the plague. In **1690**, there was a famine in Shanghai, China from the drought.

There was no harvest that season. In the autumn of **1690** Ottoman troops in the Balkans endured from 'snow, rain and frost. The snow being as high as the horses' chest, barred the roads, and the infantry could no longer move on; many animals dying, the officers were left to go on foot.'

Everyone experienced great 'shortage of provisions' and 'the hardships and sufferings they endured had never been seen before.' In **1691**, Italy, and the Netherlands experienced excessively hot and dry summers.

Jamaica experienced excessive heat and a severe drought. In **1691-92**, and extensive drought in China produced a widespread famine. In **1691-92** in New Spain [colony comprising Spain's possessions in the New World north of the Isthmus of Panama], hailstorms, a plague of locusts and torrential rains followed by drought and early frosts destroyed two maize harvests in a row and initiated a prolonged drought that lasted until **1697**. The winter of **1691-92** was awfully severe in Russia and Germany, and many people froze to death, and many cattle perished in their stalls.

Wolves came into Vienna, Austria and attacked men and women, owing to the intense cold and hunger.

All the canals of Venice, Italy were frozen, and the principal mouth of the Nile River in Egypt was blocked with frozen ice for a week.

There was snow for four or five days in the vicinity of Shanghai, China. Men, horses, and animals froze to death. For half a month it was so cold that no one went abroad. In **1692** in Northern France and England, there were heavy rains and great floods. In **1693** there was excessive scorching heat and a great drought in Italy.

In England, the heat was intense in September.

There was a scarcity of all sorts of grains in England.

Many poor people in Essex resorted to making bread from turnips.

In France, there was an awful famine.

It was excessively hot during the spring and summer in Germany.

A plague of locusts struck Wales.

A severe cold spell struck England in October, which lasted for 4 or 5 weeks.

This cold spell also struck Ireland, France, the Netherlands and Belgium.

In Virginia in the U.S. there was a great storm, which stopped the course of ancient [river] channels.

Some rivers were stopped up and channels opened for others that were so large as to allow them to be navigated [by ships]. During the winter of **1693-94**, the winter was severe in Europe with great snowfalls and cold.

In Germany and Italy, the frost was severe in November and December.

Italy experienced much snow. In Italy, there was burning hot droughty summer in **1694**, in which five months passed without one shower of rain.

In Paris, France, it was the second driest year in 30 years.

From **1694-1699** in Scotland, there was a famine. In England, there was a great dearth from rains, colds, frosts, snows; all bad weather. On 27 September **1694**, a hurricane struck offshore Barbados in the Lesser Antilles causing more than 1,000 deaths. The severe sandstorm struck Scotland on 2 November **1694**. The village Culbin was covered over and lost for 230 years. In **1694**, there was a great drought in the vicinity of Shanghai, China. This resulted in a bad harvest and a scarce year. In **1694** a drought in the African interior meant that the Nile River scarcely rose and receded quickly, leading to a famine in Egypt.

Conditions worsened in **1695**, with both continued drought and plague. During the winter of **1694-95**, England experienced frost for 7 weeks. There was continuous snow for 5 weeks. The cold was so intense that forest trees and oaks were split by the cold.

The cold in northern France and southern Germany was reported to be intense.

Sea ice completely surrounded the whole island of Iceland.

In China, there was ice on the Huangpu River.

In western Czech Republic during June, the summer was very cold and 3 intense frosts occurred leading to famine. At Poznań, Poland, the summer and harvest of **1695** was one continuous winter of cold rain, raw frosts, and mildew.

In the years **1694** to early **1697**, cold winters and cool and wet springs and autumns led to extreme famine in northern Europe, particularly in Finland, Estonia, and Livonia. It is estimated that in Finland about 25-33% of the population perished, and in Estonia-Livonia about 20%. The famines to a lesser extent also affected Sweden (especially in the northern region), Norway, and northwestern Russia. The famine decimated

the population of Finland and Estonia-Livonia either through prolonged starvation, epidemics and other diseases promoted by undernourishment, or the reliance on unwholesome or indigestible foods, and the contamination of water supplies. In Estonia in **1696**, landlords could no longer feed their farmhands and servants and began dismissing them. Many of these recently unemployed along with destitute, hungry peasants turned to begging. Even some members of the nobility were reduced to this state. In the autumn of **1696**, the famine became terrible. There was a pronounced rise in the death rates. 'The peasants died like flies.' Bodies of the dead were lying everywhere.

The winter of **1696-97** was extremely harsh. The snow was very high so corpses were left unburied until springtime and then placed in mass graves. Cases of cannibalism were reported in Estonia. In Finland in **1697**, the famines, death and epidemics closely followed. This famine was so horrific that it brought on cases of cannibalism. In Ostrobothnia, Finland, 'parents ate the corpses of their children, and children of their parents, brothers and sisters.' In northern Karelia, Finland, court documents describe cases of cannibalism. In one township in Karelia, there were so many funerals that the church bell cracked. Storehouses and manor houses were plundered. In Finland, some 500,000 people perished during the famine years of **1694**, **1695** and **1696**. In the upland regions of Scotland, cold and wet weather caused the harvest to fail every year between **1688** and **1698**. In the cold-wet hunger years of **1695-99**,

Scotland lost between 5% and 15% of its people. The upland region of Scotland lost up to 1/3 of its population due to a 7 year famine.

Rivers over a great part of Europe were in heavy floods in **1695-1697**. Many of the rivers and lakes remained frozen for comparatively longer periods of time and didn't thaw until the late spring. In Italy, there were profound deluges in **1695**.

The Po River in northern Italy overran meadows, fields, and destroyed crops, leading to a severe famine in the area.

Lake Zurich, Lake Constance and Lake Neuchâtel froze completely and one could walk over them as one would travel over a bridge. There were ice flows in the River Thames in England. During the summer in June **1695**, it snowed as far south as Lviv in the Ukraine. In October **1695**, a hurricane struck offshore the Caribbean Island of Martinique causing greater than 600 deaths.

During the winter of **1695-96**, the cold in England, the Netherlands and northern Germany was extreme. At Poznań, Poland, after 10 December **1695**, there came a great snow and a strong frost, which had no thaw or remission till 10 March **1696**. All corn and herbs died and rotted under the snow. In **1696** in England, 200 sail of colliers and some coasters were lost, with all their crews in a great storm, in the bay of Cromer,

in Norfolk.

It was a very bad year for crops in England and food was very scarce. The winter of **1696** was colder than had been known in New England in the United States, since the first arrival of the English. During a great part of the winter, sleighs and loaded sleds passed on the ice from Boston as far as Hull, Massachusetts. So great a scarcity of food, afterwards during the next year, had not been known; nor any grain ever been at a higher price. The area around Poznań, Poland went without rain in **1696**; hence a great scarcity in **1697**. The cold in England during the winter of **1696-97** was very severe.

In central Germany, it was intensely cold during January and February.

In the United States, the winter was intensely cold in the American northeast. Boston harbor was frozen as far down as Nantucket. The Delaware River was closed with thick ice for more than three months so that sleighs and sleds passed from Trenton to Philadelphia, and from Philadelphia to Chester on the ice.

On 29 April **1697**, a great hailstorm struck Wales and England. The hailstones killed many sea fowl, land fowl, lambs, and calves including a large mastiff. Several persons had their head broken. It knocked down horses and men. The storm was 2 miles wide and had a track of 60 miles. Some of the hailstones ranged in size up to the size of a man's fist and some weighed $\frac{3}{4}$ of a pound. The hailstones broke many windows, destroyed crops. Trees were broken and shattered to pieces.

On 4 May, another hailstorm struck England with hailstones 14 inches in circumference. This storm also caused excessive damage, killing people and splitting some oak trees in two.

Another hailstorm struck Wales and England on 6 June, destroying poultry, gardens, crops and windows. In **1697**, it was a bad year for the crops and food was very scarce in England.

In the same year there was a great drought in the regions around Shanghai, China. The winter of **1697-98** was severe in England.

On 25 November, the ice was 3 inches thick in London.

But in December it was so warm that people could not bear their bedclothes.

Then there was a snowfall 12 inches deep.

In January, there were great snowfalls and deep drifts.

Towards the end of January, the ice on the water was 8 inches thick.

On 14 February, there was a great snowstorm that blocked up the roads

with snow several yards deep.

On 3 May, there was a great deep snow over all of England. On 15 May, the woods were like winter.

The year **1698** was a very wet year in England. Most of the grains harvested were wet and almost useless. In the north it was not harvested until almost Christmas. And in Scotland, they were reaping in January and beating the deep snow off it, as they reaped the poor green empty crop. Bread made from what was harvested would not stick together, but fell in pieces, and tasted sweet as if made of malt.

The winter of **1698-99** in England produced the coldest year between **1695** and **1742**. The River Thames was full of ice.

In Germany, there were frequent snowfalls. Towards the end of March there was a great snowfall and the cold continued until May.

Poland experienced similar weather. There was a famine in Poland at the time and many people were consuming unwholesome foods. In **1699**, a powerful cyclone struck Sundarbans coast, Bangladesh causing 50,000 deaths.

The weather of **1699** in Germany produced a crop of wheat with black spots. The wheat was unwholesome and caused nausea both in man and beast.

There was a great scarcity and dearth. In **1700**, there was a famine in England from the rain and cold of the previous year. On 14 September **1700**, a hurricane struck Charleston, South Carolina in the United States and threatened its total destruction. On the Feast of Candlemas [2 February] **1701**, there arose in Paris, France, a furious hurricane. No one remembered having seen anything like it. The top of Saint Louis Church sank in on the assistants. This hurricane destroyed the kingdom.

The summer of **1701** in France was the most remarkable since the year **1682** because of its long duration of the heat and its high temperatures. In Italy, it produced intolerable heat. There was an excessively warm summer in England.

Russia suffered from a major famine in **1701**. Many of the famines in Russia were accompanied by such horrors as eating of bark, grass, and dung, and cannibalism. In **1701** in Moscow, pies were made of human meat and sold openly in the streets.

In **1702**, England suffered a drought. The summer was excessively hot. A great gale struck England from 26 November to 1 December **1703**. Thirteen British men-of-war were lost, and their 1,519 officers and seamen perished. On the River Thames near London, almost 700 ships were smashed together in one great heap. The number of persons drowned in the floods

of the Severn and Thames rivers in England, and lost on the coast of the Netherlands, and in ships blown from their anchors and never heard of afterwards, is thought to have been 8,000. Around 123 people were killed on land in England during this storm. The loss sustained in London alone was calculated at well over £2 million. [In present currency, that would be equivalent to over £300 million using the retail price inflation index.] The city of London was devastated. The houses looked like skeletons and there was a universal air of horror on the people who emerged from their homes after the storm. The city streets were rubble heaps of roof tiles and slates that fell from the top of houses. About 2,000 chimneys were blown down. Over most parts of south Britain and Wales, the tallest and stoutest timber trees were uprooted or snapped in the middle. It was estimated that 25 parks in several counties each lost a thousand trees and those of New Forest, Hants above four thousand.

Many cattle and sheep perished. In one place 15,000 sheep were drowned. It was called the Great Storm, and probably the most terrible that ever occurred in England. Defoe says, 'Horror and confusion seized upon all, no pen can describe it, no tongue can express it, no thought conceive it, unless some of those who were in the extremity of it.' The Great Storm reached beyond England. In Dunkirk, France, the 23-27 vessels in the road [road-stead] were dashed to pieces at Peer Heads. The effects of the storm were felt in Dieppe and in Paris and in the northeast countries such as the Netherlands. Her Majesty's ship Association, a second rate of 96 guns was anchored off Long Sand Head [in the Thames Estuary] during the hurricane. She was driven from her anchor and almost floundered taking in vast quantities of water. She was then driven north to the bank of Belgium, then the coast of the Netherlands to the entrance of the Elbe River where the storm was almost as violent as it was when they broke anchor in England. She was then driven to the coast of Norway. In **1703**, there was a famine in southwestern Pakistan. In **1704** in England, the weather was the hottest and driest summer known in the previous 20 years.

By October, there was a scarcity of water for cattle.

The summer produced remarkable lightning and thunder storms.

In Venice, Italy, the drought was so considerable that water had to be fetched five leagues [15miles].

The winter of **1704-05** was intensely cold and stormy in the Philadelphia, Pennsylvania in the U.S. In December, snow fell to the depth of three feet on the level. The Delaware River was fast with ice two feet (0.6 meters) thick, from the 10 December **1704** to the 10 March **1705**. People brought loads over the ice. All the roads were shut and there were no post for 6 weeks. In **1705**, there were great rains and floods over the continent of Europe.

On 11 August in England, there was a dreadful storm or hurricane. There

were 800 sailors lost. The news was full of losses by sea and by land. Another storm struck Ireland. Half of Limerick was drowned. The ships came onto the keys. Such a flood was never seen before. On the 29 December, a dreadful storm struck France. Tides rose up in the Loire River, 25-feet beyond normal and 118 ships, 6 of them Men-of-War were driven ashore. The summer of **1705** produced extreme heat in southern France. In Montpellier, France, the fearsome heat appeared July 17 and lasted until August 30, almost without interruption. 'In my memory,' Francois de Plantade, an assistant of Cassini wrote, 'is not to find similar to this day, the air almost as hot as hell, as that which emanates from the furnace of a glass factory, and found no other refuge than the basement. Everyone was choking and took refuge in the cellars. At several places, eggs were boiled in the sun. In Hubin's thermometer, the liquid broke through the top. Amonton's thermometer, although it was attached to a place where the air had no free access, rose almost to the degree in which it melts the tallow. A famous academician measured the temperature at 107.6° F (42° C) degrees in the shade and 212° F (100° C) in direct sunlight, the temperature of boiling water. The greater part of the grape vines burned on that single day, a phenomenon that had not happened in living memory in this country.

Paris and Lyon suffered from a drought. In **1705** in Shanghai, China there was a great drought. During the summer of **1706**, there was extreme heat and drought in England and northern Europe.

In Germany, the great drought affected the cow's milk.

The year also produced some great floods.

On 16 July a great rainstorm struck Denbigh, Wales where it rained for 30 hours continuously.

All the rivers in Denbighshire, Flintshire, and Merionethshire overflowed, and destroyed the crops, and a dozen large bridges. Great oaks were uprooted and swept away. On 7 October, there was a prodigious flood in the north of Ireland, which broke down several bridges.

In **1706** during the summer, there was a drought in the vicinity of Shanghai, China. Then in the autumn, there were continuous rains and floods and a dearth and famine. In England on 7 and 8 July **1707** was the greatest heat that had been observed in 46 years. Many horses on the road died.

In Paris, France the heat was very great and on 21 August was measured at 98.4° F (36.9° C). Many of Prince Eugene's Army died of heat in their march from Italy these two days. May through August was all very dry in Italy. On 3 and 26 July, there were great floods in Ireland. In **1707** in London, England, there was an extraordinary fall of flies. These insects covered the clothes of persons and lay so thick that the impressions of the people's feet were visible on the pavement, as they are in a thick fall of snow. In England, the summer, spring and harvest of **1708**, was

the coldest of any summer since **1647** (except for the year **1698**).

This weather preceded one of the coldest winters in the past 58 years. The winter of **1708-09** produced a severe frost throughout Europe. In France, Italy, Spain, Germany and all the northern countries there was a very severe cold. In England, the winter became known as the Great Frost, while it in France entered the legend as Le Grand Hiver. In France, even the king and his courtiers at the Palace of Versailles struggled to keep warm.

On 9 January **1709** in England, it was extremely cold. The frost was so intense that in less than 24 hours rivers froze, so as to bear loaded wagons. Urine froze under the bed [in bed pans], though there was a good fire in the room. Bread and meal were all ice. Bottled beer in deep cellars froze. Horses' feet were frozen to the ground. Cattle, sheep and birds perished. Coaches were driven over the ice on the River Thames. Large booths were built upon the ice and large fires were made on it. Great quantities of snow fell, and the storm continued for three months. In Edinburgh, Scotland, the frost lasted from early in October until the end of April.

In Italy, the cold was greater than for the past 20 years, and most of the oranges and lemons perished. The Sea was frozen both on the Coast of Genoa and Livorno, Italy. The Adriatic Sea, and the Mediterranean Sea from Genoa, Italy, by Marseilles, France to Sète, France, frozen. All the rivers in France, except perhaps the Seine in Paris and the Rhone to Viviers, were completely frozen. The large lakes and pond in the Languedoc and Provence also froze. The freezing up of the Thau Lake, very deep, very stormy, and was so complete and so solid that it opened an unknown road connected up with the Sea from Balaruc and from Bouzigues to Sète on the ice. Finally, even the sea froze off the coast of Sète, of Marseille and in the English Channel. People drove across the ice of Lake Constance and Lake Zurich with loaded wagons/coaches. Frosts and snows of **1709** ruined the majority of crops. All the olive trees died from Perpignan to Nice in France. There were many deaths in Venice, Italy. Venetians were able to skid across the frozen lagoon in Italy. On the Italian coast, several mariners on board a British man-of-war died of the cold, and several lost part of their fingers and toes. Eighty French soldiers were killed on the road by the cold near Namur, Belgium. At Paris, France, 60 men and many cattle were frozen to death. Roads and rivers were blocked by snow and ice, and transport of supplies to the cities became difficult. Paris waited three months for fresh supplies. The Ebro River was frozen over in Spain. Portugal also felt the severity of cold. Ink froze in a writer's pen, even though there was a good fire in the room.

In Scandinavia, the Baltic Sea froze so thoroughly that people could walk across the sea as late as April.

In Switzerland, hungry wolves became a problem in villages. At

Copenhagen, Denmark on 4 May **1709**, the ice in Copenhagen harbor was 27 inches thick. On 9 April, people crossed the ice from Denmark to Schonen, Sweden.

The winter was very severe in Northern Germany. In Germany many cows were frozen to death in their stalls. And many travelers on the road were frozen to death, or lost their hands, feet, noses, or ears, and others fainted, and were in great danger of life or limb, when brought to soon near the fire.

During the 'Great Winter', the temperature in Paris, France, fell to -9° C on the night of 5-6 January **1709** and stayed well below freezing for almost three weeks. Saintes on France's Atlantic coast received 24 inches of snow. The temperature on France's Mediterranean coast plunged to -11° C. January **1709** was the coldest month recorded in the past 500 years.

Although temperatures rose in February, they fell again just as the winter cereal crops began to sprout, killing them all. The price of grain reached its highest level of the entire Ancien Regime.

600,000 French men and women died during the Great Winter. In **1709** in France, fortunately, some prudent farmers had plowed their fields and sown them with winter cereal fields and barley. These were the bread grains in times of scarcity. People ate aronswurzel, couch grass and asphodel. The famine was so great that a regulation was issued in April, which directed kitchens under penalty, even capital punishment to all citizens without distinction and the communities in to state their stores of grain and food. Equally significant were the result of an unprecedented thaw floods. The Loire River broke through its embankments, rose to a height not seen in two centuries, burying everything in its course.

In **1709**, there was a famine in Scotland from the rains and cold. There was a scarcity of food in England because of a late spring, the cold weather continued until June or July. In the vicinity of Shanghai, China, there was continuous rain and floods in autumn.

Rice was very dear, owing to flood, which caused a famine. In May **1710** in England, the ground was exceedingly dry and cracked. Barley and peas were burnt. Vermin devoured all the fruits and the leaves of trees, so they were as naked as in winter.

There was an epidemic of smallpox in London, England that killed 1/8th of the population. During the winter of **1710-11** in England, the frost was severe from 18 January until March.

Ice formed 3 inches thick on the coast.

It froze indoors in the bedchambers. In the region of Carniola, Austria [now Slovenia] in **1711**, there was a famine from rain and mildew. This

famine continued for several years.

On 11-13 September **1711**, the city of Mobile, Alabama in the U.S. was almost destroyed by a hurricane from a storm surge in Mobile Bay that overflowed the town. This hurricane also destroyed churches and building in New Orleans, Louisiana.

In **1712**, there was excessive heat in low-Hungary [parts of Hungary, Slovakia and Croatia].

The summer was very hot in southern France. It caused the springs, creeks, small rivers and lakes to dry up and destroyed the crops. In southern France, there was a severe drought.

On 28 August **1712**, a terrible hurricane struck the island of Jamaica. It destroyed several ships belonging to London and Bristol and fourteen ships belonging to the island. In the harbor of Port Royal and Kingston, four hundred sailors were drowned. Many people were killed by destruction of houses and the sugar works.

In England, the years **1713–1719** produced a moderate drought. There were few rains but there were rich dews. The years **1714, 1717, 1718,** and **1719** produced very hot summers. In **1714** in London, England, there was an epidemic of smallpox. One-ninth of the population died. In the year **1715** more than one third of the population of France (6 million people) perished from hunger and destitution. The cause of this famine and those that followed was due to taille (land tax). France is a land of good soil and fine weather, almost like a Garden of Eden. But for over a hundred years leading up to the French Revolution in **1789**, it became a land of dire want and famines. Taille robbed the peasants of even their meager existence.

On 30 July **1715**, a hurricane struck the southern Bahamas and the Straits of Florida in the United States. The storm caused between 1,000 and 2,500 deaths. In **1715** during the summer, there was a great drought in the vicinity of Shanghai, China.

The winter of **1715-16** was recorded as being intensely cold throughout Europe. On 22 January **1716**, the temperature in Paris, France was -4° F (-20° C). The Seine River froze over in Paris.

Frost fair was held on the River Thames in London, England. Streets of booths were erected on the ice and an ox roasted on it, coaches driven, and many diversions exercised above the bridge. So strong was the ice below the bridge that people walked and ice-skated. Dawkes' News Letter of the 14th of January says, 'The Thames seems now a solid rock of ice; and booths for sale of brandy, wine, ale, and other exhilarating liquors, have been for some time fixed thereon; but now it is in a manner like a town; thousands of people cross it, and with wonder view the mountainous heaps of water that now lie congealed into ice. On Thursday a great cook's-shop was erected, and gentlemen went as

frequently to dine there as at any ordinary. Over against Westminster, Whitehall, and Whitefriars, printing presses are kept on the ice.'

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