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*Supplement of*

## **A survey of the impact of summer droughts in southern and eastern England, 1200–1700**

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## Supplementary information

1236

Anno Domini MCCXXXVI., [...]. Aestate quoque eadem, [...] facta est continua ariditas cum caumate fere intolerabili, per quatuor et amplius menses continuato. Ita ut paludes profundae cum stagnis sicarentur, molendina aquatica starent inutili otio arefacta, terra rimis hiaret. Aristae quoque segetum in locis quamplurimis vix bipedale susceperunt incrementum.

In the Year of the Lord 1236 [...]. In this summer, [...], there was a continuous drought with such great heat that it was almost intolerable and which lasted for four months and more. It was so much that deep marshes and ponds dried up, the water mills stood useless and idle without water, the soil broke up in fissures. In many places the ear of the seed corn hardly grew to the height of two feet above the ground.

Matthew Paris, *Chronica Majora* (Luard, 1876, p. 369-370). Translation by the author.

1252

Anno sub eodem, potissima ardenti sole torrebatur, flante continue Subsolano, Borea, vel Aquilone. Caumatis igitur et siccitatis causis multiplicatis, rorisque cessante refrigerio, poma et alii fructus, qui jam apperuerunt et ad quantitatem nucum susceperant incrementum, emarcuerunt et infatuati ceciderunt, vix aliquota parte prosperante, licet flores praeambuli fructus uberrimos promississent. Auxit autem illam fructuum jacturam residuorum, cum jam glandium grossitudinem sortirentur, gelu repentinum matutinale cum choruscatione innaturali [...] pubertatem pomorum, glandium, faginae et omne genus fructuum et etiam herbarum adeo adussit, ut vix pars decima remaneret. Veruntamen propter primitivam abundantiam adhuc pomaria pomis et agri satis abundabant; et si omnia fructuum germania remansissent, non possent arbores suos quos ediderunt fructus supportare. Ascendente autem sole usque ad fastigium solstitiale, calor immoderatus et intolerabilis adeo superficiem terrae combussit et caumata multiplicavit, ut omni gleba emarcente prata esum omnimodum pecudibus denegaverint. De noctibus insuper calor perdurans muscas et pulices et caetera generavit detrimenta, ut omnibus viventibus vivendi taedium suscitaret.

Anni quoque sub ejusdem volumine, mensibus Aprilis, Maii, Junii, Julii, aestus et ariditas incruere coepit intolerabilis, sine pluviarum aspersione vel roris beneficio continuata. Unde arborum flores, qui fructus aduberes pollicebantur, caduci infatuabantur; prata gramine spoliabantur, folia plantarum emarcuerunt; pascua pecudibus inanibus prata denegarunt. Terra hiantibus rimis indurata segetibus alimenta pro humoris carentia ministrare nequivit.

Stridebant muscae volitantes, volucres pendulis alis et rostris patentibus cantus suos cum plausibus suspenderunt. Unde aestus, caumata, et sudores infirmitates cronicas anhelas febres in Autumpni declinatione humanis corporibus promiserunt.

Ejusdem anni curriculo, post multa aestatis caumata, tempore adveniente autumpnali, facta est tanta pestifera armentorum mortalitas pluribus locis in Anglia, praecipue autumn in Northfolc et in marisco et partibus Australibus, quantam nullus se meminit praevidisse. [...] Aliud quoque tunc temporis mirabile videbatur, videlicet [arbores quarum] erat natura pria vel poma gestando producere, velut esset in Aprili, florere videbantur. [...] Gramen enim, quod in mirum fuit, etiam pratorum, adeo marcidum, aridum, et durum, mense Maio, Junio, et Julio inveniebatur, quod si manibus confricaretur, in pulverem cecidit resolutum. Cum igitur tempus aequinoctiale pluviam et temperiem arenti terrae praesentaret abundanter, facta est propter pororum apertionem terra sui prodiga beneficii, unde herbam protulit fertilem, sed degenerem et innaturalem; [...].

During the greatest part of March, and the whole of April and May of this same year, the earth was parched up by the burning of the heat of the sun, the wind continually blowing from the east, north and north-east. In consequence of the increased causes of heat and drought, and the cessation of refreshing dews, apples and other fruits, which had already appeared and become as plentiful as nuts, fell withered and useless, scarcely any portion of the thriving, although the blossoms had promised a great abundance of fruit. The loss of the fruits remaining was increased, when they attained the size of acorns, by a sudden frost in the morning, attended with unnatural lightnings [...], which burnt up the ripening apples, acorns, beech-nuts, and all kinds of fruit and herbage, to such a degree, that scarcely a tenth part remained. However, on account of the primitive abundance of the crops, the orchards still abounded with apples and the fields with corn; and, indeed, if all the buds had remained, the trees would not have been able to support the fruit they had produced. The sun rising to solstitial height in the heavens, its immoderate and unendurable heat so burnt up the surface of the earth, that all the herbage was withered, the meadows refused all kinds of food to the cattle. The heat, too, continued during the nights, and generated flies, fleas, and other injurious insects, so that all living beings grew weary of life.

During the months of April, May, June and July of this year, an intolerable heat and drought prevailed, and continued for that time, without any fall of rain or dew to refresh the earth; in consequence of which, the blossoms on the trees, which had promised an abundance of fruit, faded away and fell; the fields were stripped of their herbage, the foliage of plants withered, and the pastures refused food to the famishing cattle. The earth became hardened and gaped asunder, and, for want of moisture, could afford no nourishment to the corn; flies flitted buzzing about, and the birds, with drooping wings and open beaks, suspended their joyful songs. The burning sweats caused by this temperature gave promise to human beings of chronic diseases and gasping fevers during the fall of the year.

During this year, after an intensely hot summer, as autumn approached, a plague-like mortality, such as had never before been seen in the memory of man, arose amongst the cattle in many parts of England, but especially in Norfolk, the Marsh, and the southern districts. [...] and another remarkable occurrence was also noticed; namely, that at this time of the year, when nature usually produces pears and apples, the trees showed themselves in blossom, as they usually do in the month of April. [...] the grass, even in the meadows, was so rotten, hard,

and dry, during the months of May, June and July, that, on being rubbed in the hands, it crumbled into powder. The equinoctial season, however, gave an abundant supply of rain and moisture to the parched-up earth, which it sucked into its opened pores, and became lavish in the production of its benefits, giving forth fertile herbage, though unnatural and inferior to the usual crops [...].

Matthew Paris, *Chronica Majora* (Luard, 1880, p. 278-321). Translation by Giles (1853, p. 78-515).

1361

Anno gratiae MCCCCLXI [...]. Postea, evolutis diebus sex, vi videlicet die Maii, [...] Sequebatur siccitas nociva, et ob defectum pluviae frugum, fructuum ac feni magna sterilitas. [...] Et post festum Sancti Michaelis, statim rosariae prodixerunt rosas colorem perfectum odoresque habentes. Corvi quoque [et] aucae ac aliae aves prodixerunt et pullos. Erat autem hoc anno mortalitas sexum masculinum valde / consumens per pestilentiam.

In the Year of Grace 1361 [...].

Later, the sixth day of May [...]. It was followed by a destructive drought, and due to the lack of rain, crops, fruits and hay were largely sterile. [...] And after Michaelmas the roses produced flowers which were perfect in colour and perfume. The ravens and geese and other birds produced chicks. [...] There was a high mortality among men, who were consumed by the plague.

John of Reading, *Chronicon* (Tait, 1914, p. 148-150). Translation by the author.

1464

Anno Domini millesimo CCCCLxiiij estas fervida valde est diuretica faciem terre adustam a gramine, herbis et ordeo, etc. fecit pene sterilem. Et subsecuta est eodem anno frigiditas horrida in yeme, homines molestans et pecora.

Hoc anno in insulam de Ely estate torrida exorte sunt musce grandes, venenose, cornute, cum aculeis que, pecora percucientes et homines quosdam, ut asserebatur, eos protinus perimebant.

In the Year of the Lord 1464 there was a very hot and dry summer, so that the soil turned to dust, and grass, herbage and barley were nearly barren. And followed is this year by horrible cold in winter, which harassed men and livestock.

This year on the Isle of Ely during the scorching summer big, venomous horned flies came forth, and with their stings struck cattle and some people, so that they were killed quickly.

Anon., *A brief Latin chronicle* (Anon., 1880a, p. 180). Translation by the author.

1464

[Edward IV] A<sup>o</sup> iij<sup>e</sup>. [...] Also this yere was a grete drouthe, the whiche duryd from myddes of Marche till the morne after Mysomer day that never reyned. And this yere whete was worthe iij d. a busshell, and all maner of vetaille grete chepe [...] Also this yere was a grete pestilence thorowe all the realme.

Anon., *A short English chronicle* (Anon., 1880b, p. 80).

1473

[...] ther was a gret hote somere, bothe for manne and beste; by the whiche ther was gret dethe of menne and women, that in feld in harvist tyme men fylle downe sodanly, and unyversalle feveres, axes, and the bloody flyx, in dyverse places of Englonde. And also the hete was so grete, that it brent away whete and alle other greynis and gresse, in southe partyes of the worlde, in Spayne, Portyngale, Granade, and othere, &c. that a bowsshelle of whete was worthe xx.s; and menne were fayne in that cuntre to yeve away there childeryne for to fynde them. But, blessed be Almyghty God, no suche derthe was nozt in Englonde, ne in Fraunce.

Warkworth's chronicle (Halliwell, 1839, p. 23).

1540

The eight day of August [1540] [...] In y latter ende of this moneth, was vniuersally through the realme greate death, by reason of newe hote agues and Flixes, and some Pestilence, in whiche season was suche a droughth, that Welles and small Riuers were cleane dried, so that muche cattell died for lacke of water : and the Thamis was so shalowe, and the freshe water of so small strength, that the Salt water flowed aboue London bridge, till the raine had encreased the freshe waters.

Hall's chronicle (Hall, 1809, p. 841). Related texts in other sixteenth-century London chronicles (Grafton, 1809, p. 475, Holinshed, 1808, p. 819 and Stow and Howes, 1631, p. 581).

1540

This yeare [...] 1540 [...] This yeare was a hott sommer and drie, so that no raine fell from June till eight daies after Michaelmas, so that in divers partes of this realme the people caried their cattle six or seven miles to watter them, and also much cattle died; and also their rayned strang sickness among the people in this realme, as laskes [dysentery] and hott agues, and also pestilence, whereof many people died; wherefore the Kinges Majestie sent out commissions through his realme to everie par[ticular] bishop to exhort the people to fall to prayer and to go in procession in everie parish in the hole realme; and also my Lord Mayer and the Bishopp of London caused generall procession to be once in the weeke through the cittie, which beganne the 17th daie of September, being Fridaie in the Ember weeke, and had a sermon made in Paules quire before the procession went, and used it so everie Fridaie, which was a godlie waie.

Wriothesley, A chronicle of England, vol. 1 (Hamilton, 1875, p. 123).

1540

Anno Domini Mccccxli. [...] In this somer was a great heate and drought, so that in many places the people woulde haue giue one bushel [of grain] for grindyng of another. [...] many honeste persones died of y hote agues, and of a great laske [dysentery], through the realme. [...]

Winter 1540-1541

Anno Domini Mccccxli. [...] This winter was very colde, much frost and snowe, & a great many of bestes dyed therof.

Continuator of Fabyan, The new chronicles of England and France (Fabyan, 1811, p. 701).

<p>1556</p> <p>[...] moreover I marvel why you made my scythes so short this year whereby I have taken great loss for I have xvj dozen &amp; odde stands upon my hand which I ought to have sold if it had been good and long therefore if you send any more I pray you make them fully forty inches and more ... our scythes stand still before the feares [fears/fires?] came &amp; and harvest was so soye [soon?] and corn was so thin &amp; no man would buy our scythes because they were so shorte [...]</p> <p>writing in the year of our Lord God 1556 [...] the xvj day of August [...].</p> <p>William Hyll to John Horsmonden of Gouders [Goudhurst] in Kent, letter, cited from Beale, 1998, p. 112.</p>
<p>1634</p> <p>The whole Somer, and all the winter till the 20 December was so dry, that in many places water failed, and they drove their Cattell 3 or 4 miles to water them.</p> <p>William Whiteway of Dorchester, His diary 1618-1635 (Whiteway, 1991, p. 110).</p>
<p>1636</p> <p>30 May</p> <p>[...] as the heat, which does not usually trouble this country over much, has become very great, accompanied by so great a drought that no one remembers the like. This is the third month that not a drop of rain has fallen. As a consequence, with the plague in addition, this will certainly cause a great scarcity of everything, much greater than is experienced at present, [...].</p> <p>Anzolo Correr, Venetian ambassador in England to the Doge and Senate, letter in Calendar of state papers and manuscripts relating to English affairs, vol. 23 (Hinds, 1921, p. 561-572).</p>
<p>5 September</p> <p>[...] as the country is ruined everywhere by an excessive drought, causing the greatest suffering to everything and making the miserable weakness of the country people general, while even the purses of the greatest find it insupportable. Everyone declares that there is no memory of such a misfortune in England, whose usually damp climate is so changed that the trees and the land are despoiled of their verdure as if it were a most severe winter.</p> <p>Anzolo Correr, Venetian ambassador in England to the Doge and Senate, letter in Calendar of state papers and manuscripts relating to English affairs, vol. 24 (Hinds, 1923, p. 57-74).</p>

Table 1. Selection of drought references in medieval and early modern documentary sources in England with translation.