

The Climate of Eastern England 1250–1350¹

By H E HALLAM

THE many chroniclers of Eastern England were very clear that there were four climatic periods in the century 1250–1350 — a wet period, interspersed with summer droughts in 1250–72; a warm and dry period from the summer of 1272 to the autumn of 1289; a forty-year period of unparalleled wet and misery from the poor harvest of 1289 to the good harvest of 1326; and a period of less inclement weather from 1326 to 1350. What truth is there in the chroniclers' scheme?²

A good deal, as it turns out, but we must remember who, according to medieval belief, made the weather. It was the king, and harmony in the state went with harmony in nature. If the weather went wrong and the harvests failed then you could expect politics to be wrong as well. As a rule this meant either that rebellious subjects had risen against a duly anointed and crowned king, or that a legitimate king was ruling like a tyrant, or that a usurper was reigning in place of the rightful king. Thus the bad years 1250–72, and especially the dearth of 1256, and the famines of 1257–58, 1260, and 1271–72 correspond with the Barons' Rising against

Henry III, the good period 1272–89 covers the years of Edward I's most fruitful legislative activity and the Conquest of Wales, and the bad period 1289–1326 the period of his ill-success in Scotland, the quarrel with the barons which led up to the *Confirmatio Cartarum* in 1297, and the disastrous rule of his homosexual son, Edward II, which included the great defeat of Bannockburn in 1314, and ended with Edward II's deposition. No sooner was Edward II dead than the weather improved and the early years of the young and popular soldier-king, Edward III, which included the great victories against the French at Sluys and Crécy in 1346, were a period of better weather and greater prosperity. More objective, and more local information, is clearly necessary.³

The account rolls vary in the type of information they convey. All those used give, in the *grangia* account on the dorse of the roll, sufficient material to make possible the discovery of the ratio of crops grown to crops sown, calculated by the grain. Where there are consecutive accounts we also sometimes know the yield per acre.

¹An earlier version of this paper was presented at the International Conference on Climate and History at the University of East Anglia on 12 July 1979.

²See H E Hallam, *Settlement and Society: A Study of the Early Agrarian History of South Lincolnshire*, Cambridge Studies in Economic History, ed M M Postan, Cambridge, 1965, Chapter V, 'Climate and Sea-Floods', pp 119–36, for an early attempt to elucidate climate from the chronicles. The most important, additional, local chronicles used are: *Chronica monasterii S. Albani*, edited by Henry Thomas Riley, Rolls Series, 1863–76. These include the chronicles of Thomas Walsingham, William Rishanger, and John of Trokelowe. Thomas Walsingham is particularly valuable since he has a statement on the weather and the harvest at the end of every year from 1272 to 1327 with odd years down to 1348. Like all chroniclers he was interested mainly in the politics which so fascinated the upper classes and, like all monks, he was a gentleman and ate wheat and bread.

³The sources used will be found in the Eastern England chapter of *The Agrarian History of England and Wales*, Vol II (in the press). A much-abridged summary appears in H E Hallam, *Rural England 1066–1348*, Fontana Paperbacks, 1981, Chapter 4, 'Eastern England', Section 2, 'Crops and livestock', pp 40–55. See also F M Page, 'Bidentes Hoylandiae', *Economic History*, I, 1929 and F M Page, *The Estates of Crowland Abbey*, Cambridge Studies in Economic History, II, Cambridge, 1934. J Z Titow, 'Evidence of weather in the account rolls of the bishopric of Winchester 1209–1350', *Economic History Review*, second series, XII, 1960, pp 365–91 is important for the study of weather in Southern England, but the Winchester account rolls are in some ways less useful than the account rolls of Norwich Cathedral Priory. These last are now in the Norfolk Record Office. The priory had manors at Martham, Eaton, Gnatingdon, Denham, Gateley, North Elmham, Hindringham, Eaton, Thornham, Hindolveston, Sedgford, Hemsby, Taverham, Plumstead, Catton, Melton, and Monks' Grange, all in Norfolk.

Particularly on the estates of Norwich Cathedral Priory the reeve or bailiff also often comments upon the season in order to explain a poor result to the auditors. Finally, the Norwich accounts often give the dates of harvest, usually in the dairy account, for the milk then went to the harvesters rather than to making butter and cheese.

In East Anglia about eighty per cent of the grain grown was barley, and in Lincolnshire, Cambridgeshire, and Essex also, barley was very important. Barley is a spring grain and will stand a good deal of rain, but suffers greatly from drought. Yield ratios of 339 barley harvests in 1258-1349 have survived. Over the period 1258-1349 the yield ratios decreased from 3.44 in 1258-1322 to 3.25 in 1322-49, so that if the sowing rate was the same, the yield of a given area was 94.5 per cent in 1322-49 of what it had been in 1258-1322. By cohorts of 110 harvests the yield ratios were 3.5 in 1258-1312, 3.3 in 1312-26, and 3.12 in 1326-46. The harvests of 1326-46 were 93.9 per cent as productive as the harvests of 1258-1312. During the whole century there was a steady, not very great, but perceptible decline.

For the period 1264-1328, for the Norfolk estates of Norwich Cathedral Priory only, the account rolls tell us the dates and length of the harvests. Groups of from four to twelve harvests — in all 207 harvests — cover 25 years. The normal harvest took 26-36 days, the short harvest 25 days or less; the long harvest over 36 days. Early harvests began before 1 August; normal harvests took place mainly in August; late harvests mainly in September. At North Elmham in 1326 the harvest began on 21 July and was complete by 24 August. At Monks' Grange in 1318 the harvest began on 26 July but was not complete until 29 September. At Sedgford, in the famine year, 1316, the harvest began on 2 August and was in by 29 September. The rolls offer no support for harvests incomplete by Michaelmas day. All twenty-five harvest years were of normal length, except 1312, 1325 and 1328 which were

short and 1320 which was long. The short harvests were also early. The 1312 harvest was normal; the 1325 harvest poor, and yields for the 1328 harvest are not known. In 1325 a summer drought followed a wet winter. There were early harvests also in 1288, 1292, 1298, 1306, 1318 and 1326. There is no reliable information about the yields of barley in 1288 and 1306; the harvest of 1298 was normal; the harvest of 1292 very good; and the harvests of 1318 and 1326 poor. By normal I mean within ten per cent either way of the average yield ratio for 339 Eastern England barley harvests in 1258-1349; by poor and good 10-20 per cent below or above average; by very poor and very good over 20 per cent below or above average; by dearth and excellent 30 per cent or more below or above average. In 1292 the chroniclers say that a very hard winter preceded a wet summer with floods and Thomas of Walsingham classifies the harvests as poor. This directly contradicts the evidence of the account rolls, but we have it from only four manors. A summer drought followed the hard winter of 1326 and Thomas of Walsingham called the harvest good. That same autumn, on 24 September, Isabella had landed in Suffolk and Edward II was a captive on 16 November. Fifteen Eastern England barley harvests fell victim to the dry summer.

The late harvests are also interesting. We know nothing about the yields of barley in 1274, 1276, 1296, and 1310. The late harvest of 1319 was normal on seven manors in spite of summer drought and a wet autumn, but Thomas of Walsingham calls it very poor and several chroniclers call it a famine year. The late harvests of 1313, 1320 and 1323 were all good on three, sixteen and five manors. All three autumns were wet and Thomas of Walsingham calls the harvest of 1313 poor, and that of 1323 mediocre. His strictures clearly do not apply to the barley harvests of Eastern England, which, though late, gave good yields.

A number of other discrepancies exist

between the chroniclers and the accounts of Eastern England manorial bailiffs. At only one point do comparisons seriously affect the period 1250-72. The chronicles say 1258 was wet all autumn until 1 November and that there was famine. Barley crops on three Eastern England manors were normal and since East Anglian peasants ate barley bread they may not have suffered famine.

The good period 1272-89 was a period of drought and plenty for wheat-eaters, but barley did not do so well. The chroniclers' very good and good harvests of 1273 and 1278 were normal on twelve and poor on three Eastern England manors. In 1273 a wet summer followed floods at Cambridge and Norwich on 31 March, and in 1278 there was a summer drought.

There are seventeen discrepancies between the accounts and the chronicles during Thomas of Walsingham's forty evil years 1289-1326. The dearths of 1290 and 1295, according to Thomas, accompanied poor and very poor harvests in two drought years. In 1290 the harvest was in fact good on three manors and in 1295 normal on fourteen manors. The poor harvest of 1309 was very good on seven Eastern England manors. Similarly Thomas of Walsingham's mediocre harvests of 1298, 1299 and 1312 were normal, good, and normal on four, five, and fourteen manors. Thus the period 1289-1313 was better than the chroniclers say even though there were many dry summers.

When we get to the great famine the discrepancies are even more glaring. The most extravagant chroniclers make every year from 1315 to 1321 a famine year. Certainly the weather was foul. In 1313 a wet autumn followed a summer drought, and in 1314 the weather was unusually wet, with heavy rains and floods in the autumn. Thomas says that a poor 1314 harvest followed the poor 1313 harvest. On three Eastern England manors the harvest of 1313 was good and on four manors the harvest of 1314 was excellent. In 1315 winter, summer and autumn were all very wet, and in 1316,

after a spring drought, the summer and autumn were again very wet. These were both years of terrible famine. Unfortunately few accounts of crops are known for 1315 and 1316, but what we have do not always confirm the usual view. At Sedgeford in 1315 the lord's crops were normal, but at Kempstone his crops were a failure. At Calthorpe in 1315 the lord's wheat crop was very good, his barley poor, and his peas and oats very poor indeed. At Kempstone in 1315 the peasants' barley crop was poor, but at Calthorpe very good indeed.⁴ Death-rates, known from heriots, were not unusually large in 1315 and 1316 and the Master of the Cellar at Norwich Cathedral Priory was short of wheat, but not of barley. Neither did grants of food to the poor exceed the norm. On the other hand at Hindolveston between March 1316 and April 1317 there were 176 surrenders of holdings, and the court roll contains the perpetual refrain, 'Surrender made for great hunger'.⁵ In East Anglia 1315-17 was certainly difficult, but caution is needed before we cry disaster.

Some chroniclers claim 1318-20 as famine years. There were summer droughts in 1318 and 1319 and wet autumns in 1319 and 1320. Thomas of Walsingham calls the harvests of 1318 and 1319 poor and very poor, but on seven Eastern England manors the harvest of 1319 was normal and on sixteen manors the harvest of 1320 was good. According to Thomas three mediocre harvests in 1323-25 succeeded a poor harvest in 1322, but on five, fifteen, and sixteen Eastern England manors in 1323-25 the harvests were good, normal, and poor, and on twelve manors in 1322 the harvest was normal. Drought caused the

⁴The monks sometimes received the tythes, from which we know what crops the peasants grew and their quantity. The culture of the mills also reflects their interests.

⁵*Norfolk Archaeology*, XX, 1921, pp 179-214, especially pp 202-3. The article does not clearly state whether others took up the holdings, but since, in the period 1309-26, 443 out of 753 surrenders were for private convenience, including marriage arrangements, 136 from transferences by the tenant during his lifetime, 73 from retirements, 46 from transferences to daughters or sisters, 17 from transferences to others, and 100 were the result of stress from bad seasons, the problem may not have been so bad as it seems.

TABLE I

Weather, Harvests, and Agrarian Crises in Eastern England 1250-1350

<i>Date</i>	<i>Weather</i>	<i>Harvest</i>	<i>Crises</i>
1250	Wet: storms and floods	—	—
1251	Wet	—	—
1252	Dry winter; hot summer with drought; wet autumn	—	—
1253	Wet winter; summer drought	—	—
1254	Hard winter; summer drought; very wet autumn	—	—
1255	Wet February, March; summer drought	—	—
1256	Wet: Ouse flooded at Bedford, 19 June	—	Dearth
1257	Wet: floods on 15 July	—	Famine
1258	Wet all autumn until 1 November	—	Famine
1260	Summer storms, floods, hail storms	—	London famine
1261	Storms 27 July	—	—
1262	Storm 30 November	—	—
1263	Summer drought	—	—
1271	Floods 18 September	—	Famine 1271-72
1272	Drought in summer and autumn	Good	—
1273	Wet March: floods 31 March at Cambridge and Norwich; very wet summer	Very good	—
1274	Summer drought	Very good	—
1275	Wet summer and autumn	Good	—
1276	—	Good	—
1277	Drought: rained 10-12 October: floods at Cambridge and Bury St Edmunds	Normal	—
1278	Summer drought	Good	—
1280	Drought; floods 2-4 August	Good	—
1281	—	Good	—
1282	—	Very Good	—
1283	Wet and drought	Good	—
1284	Drought: wet all summer and most of autumn	Good	—
1285	Severe drought	Good	—
1286	Summer drought	Good	—
1287	Summer drought	Good	Glut
1288	Summer drought	Superabundant	Glut
1289	Flood in winter; summer drought; wet autumn	Poor	Dearth
1290	Winter flood; summer drought; cold, rainy 24 June	Poor	Dearth
1291	Summer drought; very wet autumn	Mediocre	—
1292	Very hard winter; wet: floods in summer	Poor	—
1293	Wet winter; dry summer	Poor	Famine
1294	Wet August, September	Abysmally poor	Famine
1295	Drought	Very poor	Dearth
1296	—	Poor	—
1297	Summer drought	Poor	—
1298	Summer drought	Mediocre	—
1299	Drought: strong wind	Mediocre	—
1300	Summer drought	—	—
1301	—	Mediocre	—
1302	Summer drought	Mediocre	—
1303	Summer drought	Poor	—
1304	—	Mediocre	—
1305	Summer drought	Normal	—
1306	Summer drought	Mediocre	—
1307	Summer drought	Mediocre	—
1308	Wet autumn	Normal	—
1309	Cold winter 1309/10; summer drought	Poor	—

TABLE I (continued)

Date	Weather	Harvest	Crises
1310	Severe frost; summer drought	—	—
1311	Summer drought	Mediocre	—
1312	—	Mediocre	—
1313	Wet autumn but summer drought	Poor	—
1314	Wet: heavy rains, floods in autumn	Poor	—
1315	Very wet winter, summer and autumn	Abysmally poor	Famine
1316	Spring drought: very wet summer and autumn	Abysmally poor	Famine
1317	Wet	Abysmally poor	Famine
1318	Summer drought	Poor	Famine
1319	Summer drought and wet autumn	Very poor	Famine
1320	Wet harvest	—	Famine
1321	—	Very poor	Famine
1322	Wet	Poor	—
1323	Wet barley burned in stack in autumn	Mediocre	—
1324	—	Mediocre	—
1325	Wet winter; summer drought	Mediocre	—
1326	Hard winter; summer drought	Good	—
1327	Summer drought	Very good	—
1330	Floods in spring; rainy weather, tempests and floods in autumn	—	—
1331	Drought all year; barley very scarce	—	—
1333	Drought: pea crop failed	—	—
1334	Drought: pea crop failed; water shortage	—	—
1337	Wet autumn	Very good	—
1338	Wet winter; dry summer; very wet autumn	Normal	—
1339	Hard wet winter; dry summer; rainy autumn	Superabundant	—
1340	Very hard winter; dry summer	—	—
1341	28 nights frost and ice; wet spring	Very good	—
1348	Rain and floods 24 June–25 December	—	—
1350	Drought in spring and summer	—	Black Death

poor harvest of 1325. The famine years therefore are strictly 1315–17, and thereafter, down to 1324, conditions were normal.

Thomas calls 1326 a good year and 1327, 1337 and 1341, very good. Just as he exaggerates the bad times so does he exaggerate the good. The summer of 1326 saw another drought and on fifteen Eastern England manors the barley harvest was poor. It was normal again in 1327, 1337, and 1341 on sixteen, four, and five Eastern England manors.

Climatic extremes were certainly noteworthy in 1250–1350, but they were not so extreme as the chroniclers claim. Barley growing became slightly more difficult on average, probably because, in spite of the

wet years 1313–17, 1320 and 1322, on the whole the summer became drier. In 1258–1312 the East Anglian farmer could expect to get 21 bushels of barley to the acre, in 1312–26, 20, and in 1326–46, 19½ bushels. The worst years were 1324–26 when he only got 16 bushels to the acre.

What impact did this slow change have upon the people? In 1086 the five Eastern counties contained 31 per cent of the population of England if we exclude the Northern Counties (except Yorkshire); by 1300 the East housed 46 per cent of the population of the same area. In most of these counties the majority of the people had less than 10–20 acres of land, that is less than the minimum for subsistence. Did the extremes of weather cause a population decline

through a high death rate? The Domesday population had trebled by 1229 and quadrupled by 1278, and at no time was there a general decline before 1300. The increase slowed in 1251-78, and again in 1278-1300, but was still going in 1300.⁶ This is not to say that the climatic change had no effect, but perhaps through the marriage rate rather than the death rate. Marriages decreased markedly in the Lincolnshire Fenland in 1260-1300, but they increased again in 1300-48, and Eastern England was still very populous and prosperous when the Black Death struck. Still there were many poor people and the churches' gifts to the poor underline the difficult years. They were 1294/5, 1295/6, 1297/8, 1305/6, 1312/13, 1322/3, and 1324/5 — not those expected.⁷

How do these findings compare with recent evidence from other parts of England? Severe winters and dry springs do not so much affect the crops as wet autumns, what one German meteorologist calls 'the north-west European' monsoon. The weather turns wet and thundery in July, sometimes after dry weeks in April, May and June, and continues wet throughout August and even

TABLE 2
Lengths, Times and Sizes of Barley
Harvests in Eastern England 1258-1390

Date	Length	Time	Size	Number of harvests	
				Length	Size
1258	—	—	Normal		(3)
1264	Normal	Normal	—	5	
1266	Normal	Long	—	5	
1267	—	—	Very good		(3)
1273	Normal	Normal	Normal	7	(12)
1274	Normal	Late	—	8	
1276	Normal	Late	—	8	
1278	Normal	Normal	Poor	4	(3)
1288	Normal	Early	—	8	
1290	—	—	Good		(3)
1292	Normal	Early	Very good	4	(4)
1295	Normal	Normal	Normal	9	(14)
1296	Normal	Late	—	11	
1297	—	—	Poor		(4)
1298	Normal	Early	Normal	6	(4)
1299	—	—	Good		(5)
1300	Normal	Normal	—	10	
1306	Normal	Early	—	10	
1309	—	—	Very good		(7)
1310	Normal	Late	—	9	
1311	—	—	Poor		(9)
1312	Short	Early	Normal	9	(14)
1313	Normal	Late	Good	11	(3)
1314	—	—	Excellent		(4)
1318	Normal	Early	Poor	11	(11)
1319	Normal	Late	Normal	11	(7)
1320	Long	Late	Good	5	(16)
1321	Normal	Normal	—	9	
1322	—	—	Normal		(12)
1323	Normal	Late	Good	12	(5)
1324	—	—	Normal		(15)
1325	Short	Early	Poor	10	(16)
1326	Normal	Early	Poor	9	(15)
1327	Normal	Normal	Normal	7	(16)
1328	Short	Early	—	7	
1329	—	—	Poor		(4)
1330	—	—	Normal		(3)
1331	—	—	Dearth		(5)
1332	—	—	Excellent		(3)
1333	—	—	Good		(14)
1334	—	—	Poor		(4)
1336	—	—	Normal		(4)
1337	—	—	Normal		(4)
1338	—	—	Normal		(4)
1340	—	—	Poor		(4)
1341	—	—	Normal		(5)
1342	—	—	Normal		(4)
1343	—	—	Normal		(4)
1344	—	—	Normal		(4)
1347	—	—	Normal		(3)
1348	—	—	Normal		(3)
1349	—	—	Good		(3)

⁶These statements are based upon the material contained in the 'Population' chapter of *The Agrarian History of England and Wales*, Vol II. I wrote the final version of this chapter in 1974 and am now prepared to be a little more positive. I have scaled the recorded population figures in the tables to make each county take the share in the later totals that it takes in the DB totals. The reader will find a brief statement of the results for each region of England in H E Hallam, *Rural England 1066-1348*, London, 1981, pp 39-40, 80, 102-3, 126-8, 151-2, 169, 192 and 219-20.

⁷The following articles connect population history and climatic history: G Utterstrom, 'Climate Fluctuations and Population Problems in Early Modern History', *Scandinavian Economic History Review*, III, 1955, pp 3-47; E Le Roy Ladurie, 'Histoire et climat', *Annales*, XIV, 1959, pp 3-34; E Le Roy Ladurie, 'Climat et récoltes aux xvii^e et xviii^e siècles', *Annales*, XV, 1960, pp 434-65; E Le Roy Ladurie, 'Aspects historiques de la nouvelle climatologie', *Revue historique*, 225, 1961, pp 1-20. The classical article on the great famine is H S Lucas, 'The great European famine of 1315', *Speculum*, XV, 1930, pp 343-77, confirmed from similar sources in H Van Werveke, 'La famine de l'an 1316 en Flandre et dans les régions voisines', *Revue du Nord*, XLI, 1959, pp 5-14. This famine did not affect the Mediterranean world and struck the wheat harvest most heavily. Flanders imported wheat from East Anglia, mainly from Lynn and Ipswich. The best summary of what was thought in 1962 about the crisis of the fourteenth century is Elizabeth Carpentier, 'Famines et épidémies dans l'histoire du XIV^e siècle', *Annales*, XVII, 1962, pp 1062-92. See also I Kershaw, 'The Great Famine and Agrarian Crisis in England 1315-1322', *Past and Present*, No 59, 1973, pp 31-50.

into September. August in England is the third wettest month (after February and October) and at the best of times under medieval conditions harvesting was precarious. The English climate is not really suitable for growing wheat, even in the lowlands, and in years when the storm track passes across the English Channel and Northern France instead of out beyond the Hebrides harvesting is difficult even now. Even so, England is quite big enough to have climatic differences in any given autumn. Cambridge and the South experienced, in 1968, one of the coldest and wettest summers of the century. The ground never dried and little children could not go out to play. Cumbria, Scotland and Ireland had weeks of sunshine and suffered drought. In Edinburgh the thermometer registered 70°F and the Scots complained of the heat. These local variations in the summer and autumn weather

induce caution when we discuss climate outside East Anglia.

Dr P F Brandon has written about late medieval weather in Sussex.⁸ Unfortunately for our purposes nearly all his account roll material is after 1350, but he can supplement our account of the decade before 1350. 1339/40 saw unusually severe weather, with an exceptionally cold winter and a very hot, dry summer. The following year was unremarkable, but in 1341/2, 1342/3 and 1343/4 (the years run from Michaelmas to Michaelmas) there were long dry spells in summer, particularly in 1344. In 1344/5 there was a hard winter followed by an unexceptional summer. In 1345/6 and 1346/7 droughty spells in summer returned. There was a rainy harvest in 1347/8 and 1349/50 was normal. Apart from the harvest of 1348 when the Eastern England chroniclers say there was rain and floods from 24 June to 25 December there were no difficult harvests. Dr Brandon is inclined to stress dryness itself as a difficulty in parts of Sussex and feels that there was not much fluctuation in the weather during his period. Of the Eastern England harvests only that of 1340 was poor: 1341-44 and 1347-48 were all normal and 1349 was good. This decade does not seem to have been a time of trial. On the other hand, Dr Brandon's criteria of normality, badness and goodness are coarser than those used here. He says that 42 per cent of his harvests — 337 out of 783 — were normal and means that they fell between 15 per cent above or below the average. For him a good harvest is 15-29 per cent, a very good harvest 30-49 per cent and an excellent harvest more than 50 per cent above the average, and poor, very poor and dearth harvests the corresponding percentages below the average. Peasant holdings in Sussex were generally larger than in Eastern

TABLE 3
Discrepancies between Chroniclers' and
Bailiffs' Accounts of Harvests in Eastern
England 1258-1341

Year	Chroniclers	Bailiffs	Number of accounts
1258	Famine	Normal	3
1273	Very good	Normal	12
1278	Good	Poor	3
1290	Poor: dearth	Good	3
1292	Poor	Very good	4
1295	Very poor: dearth	Normal	14
1298	Mediocre	Normal	4
1299	Mediocre	Good	5
1309	Poor	Very good	7
1311	Mediocre	Poor	9
1312	Mediocre	Normal	14
1313	Poor	Good	3
1314	Poor	Excellent	4
1319	Very poor: famine	Normal	7
1320	Famine	Good	16
1322	Poor	Normal	12
1323	Mediocre	Good	5
1324	Mediocre	Normal	15
1325	Mediocre	Poor	16
1326	Good	Poor	15
1327	Very good	Normal	16
1337	Very good	Normal	4
1341	Very good	Normal	5

⁸P F Brandon, 'Late-medieval weather in Sussex and its agricultural significance', *The Institute of British Geographers: Transactions*, No 54, November 1971, pp 1-17. For the later middle ages see also J Z Titow, 'Le climat à travers les rôles de comptabilité de l'évêché de Winchester (1350-1450)', *Annales*, XXV, 1970, pp 312-50.

England but the consumption of grain was so high everywhere in medieval England that there was dearth with a harvest of 70 per cent.

The other place which needs discussion is Cuxham in Oxfordshire. Professor Harvey has long ago given us his thoughts on corn production there, and now he has edited the manorial records.⁹ The account rolls seem not to mention the weather but there are good yield ratios for both wheat and barley. The average yield ratio for 39 wheat harvests in 1291-1357 was 6.4. In cohorts of 10, 10, 10 and 9 this becomes 8.25 in 1291-1306, 5.84 in 1307-21, 6.31 in 1322-40 and 4.46 in 1341-57. Compared with Oakington, Cambridgeshire 1271-1320, Ottery, Devon 1335-43, Hurdwick, Devon 1412-1537, Norwich Cathedral Priory estates, nine manors of the Bishop of Winchester 1200-1450 and the anonymous 'Husbandry', these were very good yields. The same was true of barley. The average yield for 40 harvests in 1289-1349 was 5.7. In cohorts of 10 this becomes 5.83 in 1289-1303, 5.35 in 1304-17, 6.07 in 1318-31 and 5.37 in 1332-49. The lord usually sowed his wheat at 2½ bushels to the acre and his barley at 4 bushels to the acre, so that on every ten acres, after setting on one side the seed-corn, he had 135 bushels of wheat and 160 bushels of barley.

Table 4 compares wheat and barley yields at Cuxham using the same criteria of poverty and excellence. Out of 46 harvests 33 give figures for both wheat and barley. Of these 33 in only 9 years was there virtually complete correlation between the harvests of wheat and barley. Both were excellent in 1301, both normal in 1309, both good in 1313, wheat in dearth and barley very poor in 1316, wheat in dearth

and barley poor in 1317, both normal in 1320, both excellent in 1333, wheat very poor and barley poor in 1348, wheat poor

TABLE 4
Wheat and Barley Yields at Cuxham
1289-1357

Harvest	Wheat	Barley
1289	—	Very good
1290	—	Very good
1291	Excellent	Poor
1294	Excellent	—
1297	—	Very poor
1298	Very good	Normal
1299	—	Very good
1300	Excellent	Very poor
1301	Excellent	Excellent
1302	Good	Normal
1303	Normal	Very good
1304	Good	Very poor
1305	Excellent	Good
1306	Excellent	Poor
1307	Good	Poor
1308	Poor	Good
1309	Normal	Normal
1310	—	Poor
1313	Good	Good
1316	Dearth	Very poor
1317	Dearth	Poor
1318	Very good	Excellent
1319	Dearth	Normal
1320	Normal	Normal
1321	Normal	Dearth
1322	Normal	Good
1323	Very poor	Normal
1328	Good	Excellent
1329	Poor	Good
1330	—	Normal
1331	—	Good
1332	Normal	Poor
1333	Excellent	Excellent
1334	Good	Normal
1335	Normal	Poor
1339	Dearth	Good
1340	Normal	Good
1341	Very poor	—
1342	Normal	—
1343	Poor	Good
1344	Normal	Poor
1347	Dearth	—
1348	Very poor	Poor
1349	Poor	Dearth
1350	Dearth	—
1357	Dearth	—

⁹P D A Harvey, *A Medieval Oxfordshire Village: Cuxham 1240 to 1400*, Oxford Historical Series, Second Series, eds N Gibbs, R W Southern, J S Watson and R B Wernham, Oxford, 1965, pp 46-57; *Manorial Records of Cuxham, Oxfordshire, 1200-1359*, ed P D A Harvey, Historical Manuscripts Commission, JP 23, HMSO, London, 1976.

and barley in dearth in 1349. In 9 other years the results were utterly different. There were good or excellent crops of wheat in 1291, 1300, 1304, 1306 and 1307 and poor or very poor crops of barley. There were poor or dearth crops of wheat in 1308, 1329, 1339 and 1343 and good crops of barley. On all these occasions what the farmer lost on one he gained on the other. Wheat went to extremes more than barley. There were excellent wheat crops in 1291, 1294, 1300, 1301, 1305, 1306 and 1333: excellent barley crops only in 1301, 1318, 1328 and 1333. The difference of time reflects the difference in weather. There was a dearth of wheat in 1316, 1317, 1319; 1339, 1347, 1350 and 1357: a dearth of barley only in 1321 and 1349. Never were both crops in dearth simultaneously, but times were hard in 1316, 1317, 1348 and 1349. Barley was a much more reliable crop than wheat and peasants generally ate barley or maslin bread.¹⁰

Table 5 compares barley harvests at Cuxham and in Eastern England. There are 21 comparable harvests. Only in 1318, 1329, 1331, 1332 and 1340 were harvests completely different in the two neighbourhoods. Except in 1332 the Cuxham harvest was better. Both sets of figures agree that the 1313 harvest was good and the harvests of 1319, 1320 and 1322 normal or good. There was greater correlation between barley harvests in Cuxham and Eastern England than between wheat and barley harvests in Cuxham.

I have argued that the chroniclers are a poor guide to weather conditions in the period 1250–1350 and that they need supplementation by recourse to remarks about harvests in bailiffs' accounts and to what we know about grain yields. I have also argued that we should study the grain people actually ate and drank, which, in

TABLE 5

Barley Harvests at Cuxham and in Eastern England

<i>Harvest</i>	<i>Cuxham</i>	<i>Eastern England</i>
1290	Very good	Good
1297	Very poor	Poor
1298	Normal	Normal
1299	Very good	Good
1309	Normal	Very good
1313	Good	Good
1318	Excellent	Poor
1319	Normal	Normal
1320	Normal	Good
1322	Good	Normal
1323	Normal	Good
1329	Good	Poor
1330	Normal	Normal
1331	Good	Dearth
1332	Poor	Excellent
1333	Excellent	Good
1334	Normal	Poor
1340	Good	Poor
1343	Good	Normal
1344	Poor	Normal
1348	Poor	Normal

Eastern England, was also the predominant crop, barley, rather than the gentleman's wheat. At Cuxham barley yields seem to have been very much more reliable than wheat yields and seldom did both crops fail. Crops and climate both varied too according to locality and to a multitude of other factors. Dr Titow has indeed been able to show congruence between weather and poor harvests, but even in the lengthy series of 80 wheat harvests on the Winchester estates 35 were normal (i.e. 10 per cent either way). Dearth occurred in 1315, 1316, 1339 and 1349, but in this same period of autumnal disaster came the excellent harvests of 1318 and 1326. Doubt must therefore continue to exist about the extent of the Great Famine and its impact upon the people. Certainly there was a crisis but it was not so bad as the chroniclers believed.

¹⁰ On Dr Brandon's criteria only 1349 would be a dearth year in barley and there would be no dearth years in wheat. In barley there would be no excellent years and in wheat only 1301.