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**Before and after the Black Death:  
money, prices, and wages in  
fourteenth-century England**

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# Before and After the Black Death

Money, Prices, and Wages in Fourteenth-Century England

*John Munro*

That the fourteenth century was one of the most violent centuries – before the twentieth, the most violent of all – is now a common-place concept in European history. Less commonly understood, however, is the fact that this century also marked one of the most violent oscillations in monetary flows, prices, and wages, with two prolonged periods of inflation, each followed by prolonged deflations.<sup>1</sup> Since an examination of all these oscillations for the entire fourteenth century is not feasible, with the space constraints imposed, this study will focus on those preceding and following the Black Death.

## **The problem of money and prices before the Black Death**

The fourteenth century opened with the end of a long-sustained inflation, one that had begun as far back as the 1180s; and it was accompanied by a sustained growth in population, which possibly came to an end with the Great Famine of 1315-17 (or 1315-22, according to some historians). Indeed, the most popular explanation for this inflation was the population growth itself.<sup>2</sup> But for reasons that I have explored in depth elsewhere, population growth alone cannot explain inflation.<sup>3</sup> To be sure, it can explain why grain prices rose, and rose more than other prices: with inelastic supplies of grain, and thus with limited land resources, the absence of technological changes, and the inevitable law of diminishing

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1. They are very different in character from those of the later sixteenth-century Price Revolution and the ensuing General Crisis period of the seventeenth century, and not just because they are more compressed.
  2. See in particular Abel 1978 and 1980, chapters 1-3; Postan 1950, 1952, 1954, 1966, 1972, chapter 3, pp. 27-40; Hatcher 1977, pp. 11-73.
  3. See in particular: Munro 1991(a) and 2003(a). See also Munro 1999.

*Table 1. Official wages in England (for the kingdom and for London) for the summer and winter months, from 1290 to 1444*

| Year                 | Kingdom (national): summer wages in coin only (pence sterling) | Kingdom (national): summer wages in coin with food and drink | Kingdom (national): winter wages in coin only (pence sterling) | Kingdom (national): winter wages in coin with food and drink | London: summer wages in coin only (pence sterling) | London: summer wages in coin with food and drink | London: winter wages in coin only (pence sterling) | London: winter wages in coin with food and drink |
|----------------------|--|--|--|--|--|--|--|--|
| 1290                 |  |  |  |  | 5.0d   | 2.0d   | 3.0d   | 1.0d   |
| 1290 <sup>a</sup>    |  |  |  |  | 4.0d   | 1.5d   | 4.0d   | 1.5d   |
| 1350-51              | 3.0d   |  | [less] <sup>c</sup>  |  | 6.0d   |  | 5.0d   |  |
| 1350-51 <sup>b</sup> | 4.0d   |  |  |  |  |  |  |  |
| 1360 <sup>d</sup>    | 4.0d   |  | [not stated]   |  |  |  |  |  |
| 1362                 |  |  |  |  | 6.0d   |  | 5.0d   |  |
| 1372                 |  |  |  |  | 6.0d   |  | 5.0d   |  |
| 1382                 |  |  |  |  | 6.0d   |  | 5.0d   |  |
| 1444                 | 5.5d   | 4.0d   | 4.5d   | 3.0d   |  |  |  |  |

Sources: Tomlins et al., eds. 1810-22, vol. I, pp. 311-12, vol. II, pp. 337-39; Riley, ed. 1860, i, pp. 99-100, ii, pp. 541-43; Riley, ed. 1868, pp. 253-55; Sharpe, ed. 1905, pp. 148, 301 and 1907, p. 184.

OBS:

a. The lower summer rate here represents quarterly-seasonal wages from Michaelmas (29 September) to Martinmas (12 November, when the winter wage commenced); and from Candlemas (Purificatio: 2 February) to Easter (when the summer wage commenced).

b. The higher rate of 4d per day was for master free-masons only; other master masons and master carpenters were to receive only 3d per day.

c. No winter wage was specified; but wages from Michaelmas to Easter were to be 'less according to the rate and discretion of the justices [of the peace]'.  
 d. The rate is for the chief master masons and master carpenters; but a wage rate of 3d or 2d per day was specified for others 'according as they be worth'.

returns. But the explanation for a general rise in prices, i.e., a rise in most prices, has to be sought in monetary explanations; and the later thirteenth and early fourteenth centuries did constitute an era of significant monetary expansion, in terms of both the stocks of coined moneys and their flows.<sup>4</sup>

Furthermore, according to the demographic explanation for economic changes in early fourteenth-century England, that population growth, the change in land:labour ratio, and the consequent fall, or supposed fall, in the marginal productivity of labour ('diminishing returns') should have produced a fall in 'real wages': that is, a reduction in the quantity of real goods and services that a labourer could purchase with his daily money wages, paid in silver coin. And yet the available evidence on wages and prices does not reveal any distinct trend of falling real wages before the Great Famine era.<sup>5</sup>

Thereafter, in the decades following the Great Famine, we witness one of the most striking and puzzling phenomena in all of England's recorded monetary and price history: (1) a severe, indeed dazzling, plunge in English mint outputs, still entirely in silver; and, accompanying that, (2) an almost equally drastic deflation, reflected in the 35 percent fall in the Phelps Brown-Hopkins index (1451-75 = 100), from 138 in 1321-25 to just 90 in 1341-45, on the eve of the Black Death. Postan, of course, evidently wanted to attribute the fall in at least the grain-price index to the demographic consequences of the Great Famine, or rather to a more general Malthusian crisis of overpopulation in a relatively primitive agrarian economy: 'when the poorer lands, no longer new, punished the men who tilled them with failing crops and with murrain', so much so as 'to send the population figures tumbling down'.<sup>6</sup> Lawrence Poos has recently provided evidence to indicate significant population decline in rural Essex after the Great Famine and on into the post-Plague era.<sup>7</sup> For Europe more generally, one can

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4. See Mate 1975; Mayhew 1974; Munro 1983.

5. Phelps Brown and Hopkins 1955 and 1956. Changes in real wages are commonly calculated by using index numbers, with this equation:  $NWI/CPI = RWI$ . That is, the nominal (money) wage index divided by the consumer price index equals the real wage index. In this study, the common base 100 equals the 25-year mean of a 'basket' of consumer prices and of master masons's money wages in the period 1451-75.

6. Postan 1954; quotation from p. 14 in the reprint in Postan 1973(a), pp. 3-27.

7. Poos 1985 and 1991.

Table 2. *Prices and wages in England, 1286-90 to 1406-10: The Phelps Brown and Hopkins' 'Basket of Consumables' price index and the money wages of master building craftsmen (masons and carpenters), in quinquennial means (base 100 = 1451-75)*

| Year    | Grains and barley malt | Meat, fish, dairy | Fuel and textiles | PBH price index (adj) 1451-75 = 100 | Nominal day wage in d. for master | Nominal wage index 1451-75 = 100 [6d] | Nominal day wage in d. for labourer | Nominal wage index 1451-75 = 100 [4d] | Real wage index master 1451-75 = 100 | Real wage index labourer 1451-75 = 100 |
|---------|------------------------|-------------------|-------------------|-------------------------------------|-----------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|--|
| 1286-90 | 90.42                  | 84.53             | 34.80             | 80.52                               | 3.00                              | 50.00                                 | 1.50                                | 37.50                                 | 62.93                                | 47.20                                  |
| 1291-95 | 148.28                 | 82.27             | 44.20             | 107.45                              | 3.00                              | 50.00                                 | 1.50                                | 37.50                                 | 47.22                                | 35.42                                  |
| 1296-00 | 124.21                 | 91.60             | 60.20             | 102.34                              | 3.00                              | 50.00                                 | 1.50                                | 37.50                                 | 49.11                                | 36.83                                  |
| 1301-05 | 106.11                 | 90.00             | 52.60             | 92.35                               | 3.30                              | 55.00                                 | 1.65                                | 41.25                                 | 59.57                                | 44.68                                  |
| 1306-10 | 126.33                 | 104.17            | 70.60             | 109.81                              | 3.60                              | 60.00                                 | 1.80                                | 45.00                                 | 55.24                                | 41.43                                  |
| 1311-15 | 120.66                 | 122.53            | 75.60             | 115.33                              | 4.00                              | 66.67                                 | 2.00                                | 50.00                                 | 58.32                                | 43.74                                  |
| 1316-20 | 215.74                 | 132.00            | 68.60             | 161.91                              | 4.00                              | 66.67                                 | 2.00                                | 50.00                                 | 44.85                                | 33.64                                  |
| 1321-25 | 167.84                 | 122.07            | 104.33            | 137.97                              | 4.00                              | 66.67                                 | 2.00                                | 50.00                                 | 48.87                                | 36.65                                  |
| 1326-30 | 118.72                 | 108.07            | 100.45            | 111.07                              | 4.00                              | 66.67                                 | 2.00                                | 50.00                                 | 60.82                                | 45.61                                  |
| 1331-35 | 131.16                 | 104.47            | 96.00             | 114.12                              | 4.00                              | 66.67                                 | 2.00                                | 50.00                                 | 59.55                                | 44.66                                  |
| 1336-40 | 91.45                  | 96.27             | 96.75             | 94.32                               | 3.60                              | 60.00                                 | 1.80                                | 45.00                                 | 64.23                                | 48.17                                  |
| 1341-45 | 90.32                  | 93.47             | 83.13             | 90.06                               | 3.00                              | 50.00                                 | 1.50                                | 37.50                                 | 55.78                                | 41.83                                  |
| 1346-50 | 111.53                 | 98.60             | 91.63             | 102.70                              | 3.00                              | 50.00                                 | 1.50                                | 37.50                                 | 49.14                                | 36.85                                  |
| 1351-55 | 146.68                 | 115.00            | 133.60            | 132.18                              | 3.60                              | 60.00                                 | 1.80                                | 45.00                                 | 46.51                                | 34.89                                  |
| 1356-60 | 129.74                 | 111.60            | 162.35            | 129.46                              | 4.60                              | 76.67                                 | 2.60                                | 65.00                                 | 59.31                                | 50.16                                  |



| Year    | Grains and barley malt | Meat, fish, dairy | Fuel and textiles | PBH price index (adj) 1451-75 = 100 | Nominal day wage in d. for master | Nominal wage index 1451-75 = 100 [6d] | Nominal day wage in d. for labourer | Nominal wage index 1451-75 = 100 [4d] | Real wage index master 1451-75 = 100 | Real wage index labourer 1451-75 = 100 |
|---------|------------------------|-------------------|-------------------|-------------------------------------|-----------------------------------|---------------------------------------|-------------------------------------|---------------------------------------|--------------------------------------|--|
| 1361-65 | 168.60                 | 123.80            | 142.78            | 146.64                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 57.05                                | 51.35                                  |
| 1366-70 | 161.46                 | 128.13            | 147.15            | 146.10                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 58.13                                | 52.32                                  |
| 1371-75 | 130.45                 | 134.13            | 147.60            | 135.26                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 62.26                                | 56.03                                  |
| 1376-80 | 105.00                 | 110.00            | 123.71            | 110.62                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 77.27                                | 69.54                                  |
| 1381-85 | 114.19                 | 109.13            | 117.21            | 112.90                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 73.89                                | 66.50                                  |
| 1386-90 | 96.54                  | 106.20            | 108.38            | 102.53                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 81.31                                | 73.18                                  |
| 1391-95 | 110.89                 | 102.80            | 103.25            | 106.33                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 79.53                                | 71.57                                  |
| 1396-00 | 117.42                 | 109.00            | 100.28            | 110.84                              | 5.00                              | 83.33                                 | 3.00                                | 75.00                                 | 75.59                                | 68.03                                  |
| 1401-05 | 126.71                 | 107.20            | 103.95            | 114.84                              | 5.10                              | 85.00                                 | 3.20                                | 80.00                                 | 75.29                                | 71.29                                  |
| 1406-10 | 114.81                 | 108.47            | 108.83            | 111.23                              | 5.80                              | 96.67                                 | 3.80                                | 95.00                                 | 87.56                                | 85.89                                  |

Sources: Phelps Brown and Hopkins 1955 and 1956.

OBS: The justification for the commodity weights in their basket, especially for the base 1451-75 = 100 was taken from the account books of the Savernak household, in Dorset, published in Wood-Legh 1956. I have utilized the working papers in the Phelps Brown Papers Collection in the Archives of the British Library of Political and Economic Science to correct errors and to interpolate missing data.

cite evidence for regional depopulations in early-fourteenth century Provence and Tuscany, though evidently related to the horrendous warfare then afflicting these regions.<sup>8</sup> Bruce Campbell, however, has provided equally compelling evidence of continued population growth in Norfolk, while also demonstrating in various articles that late-medieval English agriculture was far less primitive and far less prone to Malthusian pressures than Postan had indicated.<sup>9</sup> Richard Smith's masterful survey of 'demographic developments in rural England, 1300-48', while inconclusive, noting complex regional variations in demographic decline, with continued if slow growth, or stagnation, does not lend support to Postan's drastic views.<sup>10</sup> Nor do the nominal-wage data support the depopulation hypothesis; and the fall in prices was general, and not, as Table 2 demonstrates, limited to just grains.

This prolonged fall in prices was instead genuine deflation, for which monetary reasons must be sought. The true explanation for this evidently stark monetary contraction and deflation, apparent also from the Tuscan price data,<sup>11</sup> remains a mystery that cannot satisfactorily be resolved. Possibly it was due to a *relative* scarcity of precious metals, if, as several historians have asserted, the major German and Central European silver mines had begun to experience not just diminishing returns but serious physical depletion by the early fourteenth century, while the European economy continued to grow, and with it, the aggregate demand for coined money.<sup>12</sup> Indeed, as Nicholas Mayhew has also demonstrated, contrary to another of Postan's assertions, coined money is perishable to some considerable degree: from wear, tear, and normal loss in circulation, from shipwrecks, unrecovered hoards, conversion

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8. Herlihy 1967, pp. 55-77; Herlihy and Klapisch-Zuber 1985, pp. 232-79; Munro 1991(b); Harvey 1991.

9. B. M. Campbell 1983(a), 1983(b), 1984 and 2000.

10. Smith 1991; see also Harvey 1991 and 1966, with a much stronger attack on Postan's thesis, denying any evidence of population decline before the Black Death; and see also Hallam 1988, also casting doubts on general population decline before 1348. But also note Smith's criticisms of Hallam's data.

11. Herlihy 1967, pp. 122-25.

12. Thus: if aggregate supply and net national income should expand – with, say, increased capital investments and technological changes – at a greater rate than the expansion in the stocks and/or flows of money, then prices should fall. See Spufford 1988, pp. 267-82; Nef 1952; Kovacevic 1960; Braunstein 1983; Westermann 1986; Munro 1991(a).

into jewellery and plate, etc., so that the money supply would indeed contract, if not continually replenished with fresh minting.<sup>13</sup> For England itself, some historians have also suggested that the Crown's foreign military expenditures (under both Edward II and Edward III) had led to major outflows of bullion, though both the fall in mint-outputs and the onset of deflation seem to precede the evidence for any such drastic bullion outflows.<sup>14</sup> Finally, since England in this era was minting only silver, and no gold before January 1344 (none since 1257), the very dramatic rise in the bimetallic ratio, from about 12.0:1 in the 1290s to 14.2:1 in the mid-1320s, may have instigated a large outflow of silver coinage to acquire the higher valued gold. Indeed, such bullion movements may have been necessary to permit England's inauguration of an effective gold coinage in the period 1344-52, though with a then falling bimetallic ratio.<sup>15</sup>

Some very general indication of possible bullion outflows from England and a relative scarcity of specie during the second quarter of the fourteenth century may be found in the coinage-output statistics (Table 3). The mean annual values of those outputs (all in silver) fell from a peak of £125,836 sterling in 1306-10 to a nadir of £381 in 1326-30, recovering only to a mean of £7,091 in 1346-50, with the outbreak of the Black Death. Such mint-accounts provide, however, only a very general and very tenuous guide to current monetary conditions. They can be of some value in that years with very low mint outputs generally coincide with eras of prolonged deflation (marked as well by complaints about the scarcity of specie); and, conversely, years of very high mint outputs generally coincide with eras of prolonged inflation. But extrapolating a nation's current money supply from these accounts is an enterprise fraught with great dangers, for many complex reasons, the most important of which is that mint-accounts combine stocks and flows in unpre-

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13. See Mayhew 1974; Munro 1983.

14. Prestwich 1977; Ames 1965; Mate 1975; Spufford 1988, pp. 267-88.

15. The fall in the bimetallic ratio may have been due to both declining silver outputs from Bohemian mines and increasing supplies of West African (Sudanese) and Hungarian gold. See especially Lane 1977; Spufford 1986, Graph 3 and Table II, pp. li-lxiii; Spufford 1988, pp. 267-88 (on 'the victory of gold'), 340-42. Spufford's dates have been adjusted by those of Lane. See also Mate 1978.

*Table 3. England: Outputs of gold and silver coinages in kilograms of fine metal and in pounds sterling values, 1286-90 to 1406-10, in quinquennial means*

| Year    | Silver coinage outputs |                  | Gold coinage outputs |                  | Total Values in £ sterling | Price Index 1451-75 = 100 |
|---------|------------------------|------------------|----------------------|------------------|----------------------------|---------------------------|
|         | Total kilograms        | Value £ sterling | Total kilograms      | Value £ sterling |                            |                           |
| 1286-90 | 17,280.60              | 54,056.78        |                      |                  | 54,056.78                  | 80.52                     |
| 1291-95 | 1,552.35               | 4,856.03         |                      |                  | 4,856.03                   | 107.45                    |
| 1296-00 | 12,071.42              | 37,761.54        |                      |                  | 37,761.54                  | 102.34                    |
| 1301-05 | 16,017.46              | 50,105.48        |                      |                  | 50,105.48                  | 92.35                     |
| 1306-10 | 40,226.55              | 125,835.83       |                      |                  | 125,835.83                 | 109.81                    |
| 1311-15 | 10,706.71              | 33,492.50        |                      |                  | 33,492.50                  | 115.33                    |
| 1316-20 | 7,275.68               | 22,759.61        |                      |                  | 22,759.61                  | 161.91                    |
| 1321-25 | 1,780.11               | 5,568.49         |                      |                  | 5,568.49                   | 137.97                    |
| 1326-30 | 121.86                 | 381.19           |                      |                  | 381.19                     | 111.07                    |
| 1331-35 | 209.06                 | 665.13           |                      |                  | 665.13                     | 114.12                    |
| 1336-40 | 429.49                 | 1,551.60         |                      |                  | 1,551.60                   | 94.32                     |
| 1341-45 | 5,077.46               | 17,710.47        | 240.01               | 9,859.48         | 27,569.96                  | 90.06                     |
| 1346-50 | 1,991.05               | 7,090.87         | 675.84               | 27,123.30        | 34,214.17                  | 102.70                    |
| 1351-55 | 17,442.91              | 67,245.28        | 1,939.78             | 83,567.73        | 150,813.01                 | 132.18                    |

| Year    | Silver coinage outputs |                     | Gold coinage outputs |                     | Total<br>Values<br>in £ sterling | Price<br>Index<br>1451-75 = 100 |
|---------|------------------------|---------------------|----------------------|---------------------|----------------------------------|---------------------------------|
|         | Total<br>kilograms     | Value<br>£ sterling | Total<br>kilograms   | Value<br>£ sterling |                                  |                                 |
| 1356-60 | 4,423.02               | 17,081.46           | 1,726.69             | 74,406.84           | 91,488.31                        | 129.46                          |
| 1361-65 | 1,630.81               | 6,298.11            | 2,415.24             | 104,077.76          | 110,375.86                       | 146.64                          |
| 1366-70 | 293.82                 | 1,134.73            | 1,729.03             | 74,507.35           | 75,642.08                        | 146.10                          |
| 1371-75 | 316.97                 | 1,224.11            | 802.61               | 34,586.02           | 35,810.13                        | 135.26                          |
| 1376-80 | 356.90                 | 1,378.32            | 235.33               | 10,140.85           | 11,519.17                        | 110.62                          |
| 1381-85 | 317.41                 | 1,225.83            | 161.84               | 6,973.80            | 8,199.63                         | 112.90                          |
| 1386-90 | 247.51                 | 955.89              | 504.81               | 21,753.33           | 22,709.22                        | 102.53                          |
| 1391-95 | 193.49                 | 747.24              | 626.55               | 26,999.15           | 27,746.40                        | 106.33                          |
| 1396-00 | 175.60                 | 678.14              | 391.14               | 16,855.14           | 17,533.28                        | 110.84                          |
| 1401-05 | 66.34                  | 256.22              | 168.67               | 7,268.39            | 7,524.61                         | 114.84                          |
| 1406-10 | 10.59                  | 40.91               | 69.01                | 2,973.57            | 3,014.48                         | 111.23                          |

Sources: See Table 2, for the Phelps Brown and Hopkins 'Basket of Consumables' price index. For the mint outputs, see: Crump and Johnson 1913; Brooke and Stokes 1929; Challis 1992; Munro 1973, Appendix I, Tables A-B, pp. 188-97; Munro 1981, especially for the Calais mint data; Munro 1983 and 1984(a); Munro 2003(b).

dictable and unquantifiable fashions.<sup>16</sup> Nevertheless, some brave historians believe that a 30-year running average of such outputs may provide an acceptably reliable indication of the coined money stock. Recently, two economic historians have used a combination of mint accounts and coin hoards to show that the English money supply contracted by over one half in this era.<sup>17</sup>

### **The problem of wages, nominal and real, before and after the Black Death**

What is especially striking and peculiar about this deflation, though affording further evidence that it was a genuine deflation, was the marked decline in nominal or money wages shown in the accompanying tables. From about 1337 to 1340, the mean money wage of a master building craftsmen in southern England fell from 4d per day to 3d per day, a decline of 25 percent; and that very low mean wage-rate was maintained until early 1351, i.e., several years after the Black Death.<sup>18</sup> The only other period in recorded English price-history with any such decline in the nominal wages of building craftsmen came almost six centuries later: in the post-World War I slump of 1920-23 (31.3 percent decline) and the early depression years of 1929-34 (8.3 percent decline).<sup>19</sup> In the earlier part of this early-fourteenth century period, before this fall in

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16. An absence of minting may indicate only that the nation's mints were offering a mint price for bullion uncompetitive with those of neighbouring foreign mints. With coinage debasement in a bimetallic system (in England, after 1344), a mint's coinage debasement in, say silver, may have succeeded in recoinng much of the current silver monetary stock, in inducing dishoarding, and in attracting foreign bullion, but at the expense of losing the now 'disfavoured' gold to foreign mints.

17. Mayhew 1987, Table I, p. 125: indicating that the coined money supply contracted from about £1,100,000 sterling in 1311-24 to just £500,000 in the 1340s. See also Mayhew 1974 and 1995; and sources in n. 14 above. For a more recent estimate, see Allen 2000 and 2001, especially Table 1: an estimated coined silver stock of £1,900,000-£2,300,000 in 1319, falling to about £700,000-£900,000 in 1351.

18. See the sources cited above in n. 5 (Phelps Brown and Hopkins). Wages for masons and carpenters at the Oxford colleges did not fall, however; and remained at the daily rate of 4d set from at least 1300.

19. Phelps Brown and Hopkins 1955, Table 1, p. 178 (cited from the reprint in Carus-Wilson, ed. 1954-62, vol. II, pp. 168-78).

nominal wages, i.e., with continued nominal wage rigidity,<sup>20</sup> real wages did rise, though the brief rise appears to be dramatic only because of the recovery from the drastic nadir of the Great Famine years. When the real-wage of those master craftsmen peaked in 1334-35, it was not appreciably higher than in the very early years of the century (1303-07). Then their real wages suffered a sharp fall, indeed they fell quite steeply before the Black Death, with the initial recovery of the price level from 1344, and especially with the inflation that soared immediately after the Black Death, one that endured for a full generation.

That is why the Ordinance (1349) and Statute of Labourers (1350-51) were so very unreasonable and cruel, but also so difficult to enforce: in attempting to fix money-wages at the pre-Plague level, when both money and real wages had been so unusually low.<sup>21</sup> Thus, specifically forbidding anyone to offer or accept any wages higher than those prevailing in 1346 (20 Edwardi III), the Statute of Labourers set the maximum summer wages (Easter to Michaelmas) for master masons, carpenters, and tilers, 'without meat or drink', at 3d per day; for their servants and labourers, at 1½d a day; but it also permitted a rate of 4d per day for master free-masons.<sup>22</sup> This harsh statute remained in force (reconfirmed numerous times), ostensibly on a national basis, until 1444, when Parliament finally raised the maximum daily rate for such craftsmen to 5½d for summer and 4½d for the winter season, without food and drink (or: 4d and 3d, respectively, with food and drink: see Table 1).<sup>23</sup>

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20. Money wages for master masons and carpenters were typically 3d per day from before 1264 to 1302; for many, 3.5d until 1310; and then 4d until 1338. See n. 3 above.

21. For other analyses of medieval English wages before and after the Black Death, see in particular Farmer 1983, 1988 and 1991. His conclusions do not always match my own. For the more general economic and social consequences of the Black Death, see: Hatcher 1994 and 1977, pp. 11-73; Platt 1996, pp. 1-47, 177-92; Bolton 1996; Putnam 1908; Penn and Dyer 1990.

22. Statute 25 Edwardi III stat. 2 c. 3, in Tomlins et al., eds. 1810-22, vol. I, pp. 311-12. Wages for the winter season from Michaelmas to Easter were not specifically stipulated, except that they were to be 'less according to the rate and discretion of the justices'. For a discussion of this Statute, and the subsequent labour legislation, see Farmer 1991, pp. 483-90.

23. Statute 23 Henrici VI c. 12 (1444-45), in Tomlins et al., eds. 1810-22, vol. II, pp. 337-39.

The city of London, however, had blatantly ignored the 1349 Ordinance, and, in the following year (1350), it issued its own wage ordinance: to fix the maximum wage for building craftsmen at 6d per summer and 5d per winter day (i.e., Easter to Michaelmas to Easter), one pence higher than the maximum summer wage permitted in the previous such ordinance of 1290, but double that permitted in the 1349 royal Ordinance and the 1351-52 national statute.<sup>24</sup> Indeed, such rates for master building craftsmen were already in force, in 1349, at Westminster Abbey.<sup>25</sup>

Thereafter, but *not* immediately after the Black Death, money wages did rise, certainly for these urban-based craftsmen.<sup>26</sup> At Oxford, where most building craftsmen had not suffered the nominal wage cuts in the 1330s, the prevailing daily wage rate rose from 4d to 5d during the 1350s; in other small-sized towns the rate rose from 3d to 5d by the end of the decade. Not until 1363, as noted before, did Oxford masons and carpenters gain the daily rate of 6d, at least for summer work, that London had authorized in 1350; and not until about 1407-09 did the mean daily rate for craftsmen in the other smaller towns achieve the same level of 6d per day. In many, indeed evidently most, of the Winchester manors and at Battle Abbey, the daily wage for such building craftsmen, while soon rising back to the 4d level that had prevailed from about 1310 to 1337, remained fixed at that truly low level – even if 25 percent above that stipulated by the Statute of Labourers – with some occasional exceptions for senior craftsmen at 5d daily, until about c.1410-c.1425.<sup>27</sup>

24. Riley, ed. 1860, I, pp. 99-100; II, pp. 541-43; Riley, ed. 1868, pp. 253-55; Sharpe, ed. 1905, pp. 148, 301 and 1907, p. 184.

25. Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection, Box P9.

26. Beveridge 1936-37 and 1955-56. See his comments, in the first article, on 'the failure of the Black Death to cause any immediate change of [wage] rates' in the Winchester manorial accounts of 1349-50.

27. For the following urban and manorial records, in: (1) Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection: Canterbury, 1393-1600 (Box D.3); Dover, 1227-1565 (Box H.13-14); Exeter (Exebridge Accounts), 1338-1600 (Box F.1); Westminster Abbey, 1393-1541 (Box P.10); Winchester College, 1354-1513 (Box F.8); York, 1354-1513 (Box I.10); Battle Abbey: Alciston Manor, 1336-1487 (Boxes H.10-11); Downton, 1257-1306 (Box C.157); Esher, 1257-1306, 1270-1308, and 1300-1453 (Boxes C. 157, A.31-32); Hinderclay (Suffolk), 1262-1405 (Box G.14); Itch-



Nora Kenyon Ritchie, however, did find a few examples of higher wage rates, though largely for agricultural workers, given in some Essex manors in the late 1380s. Furthermore, such evidence comes from judicial proceedings and not from account rolls. Nevertheless her hypothesis is certainly one to be considered: that aggressive new leaseholders of former demesne lands were more willing to offer higher wages to attract labour than were traditional manorial lords. Rather surprisingly, no one has pursued or investigated this intriguing thesis since the publication of her article, in 1934.<sup>28</sup>

London's own 1350 wage ordinance was soon if not immediately allowed to lapse. For when the Tower Bridge accounts commence in 1381, the prevailing daily rate then ranged from 7d to 7½d, and

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ingswell (Ecchinswell), 1270-1453 (Box A.33); Meon, 1257-1306 (Box C.157); Nailsbourne, 1257-1306 (Box C.157); Overton, 1309-1453 (Box A.33); Redgrave (Suffolk), 1323-1492 (Box G.14); Southwark (Bishop of Winchester), 1406-1454 (Box A.34); Taunton, 1270-1308, 1309-1453 (Boxes A.31-32); Wargrave, 1257-1306 (Box C.157); Witney, 1257-1306 (Box C.157); Wycombe, 1257-1306, 1309-1453 (Boxes C.147, A.33); (2) The London Guildhall Manuscripts Library: Armourers' Company Accounts (1499-1557): MS 12.065, vol. I; Bakers' Audit Books (1505-1547), MS 5174, vol. I; Brewers' Guild, Warden's Accounts (1424-1562): MS 5440; Carpenters' Guild, Warden's Accounts (1456-1573): MS 4326, vols. I and II; Cutlers's Guild Accounts (1442-1497): MS 7146, roll I; Grocers' Guild, Warden's Accounts (1452-1578): MS 11,570-571, vols. I-VI; Ironmongers' Guild Accounts (1455-1561): MS 11,698: Vols. I-II; Pewterers' Company Accounts (1474-1500): MS 7086, vol. I; (3) Corporation of London Record Office: Bridge Master's Account Rolls, 1381-1398; Bridge Master's Accounts: Weekly Payment Series, 1404-1510 (Vols. I-III). At Battle Abbey (Box H:10-11), carpenters and masons had their pay raised from 4d to 5d daily in 1425; at Itchingswell (Box A.33:159432), from 1433; but at Overton (Box A.33:159406), and Wycombe (Box A.33:159407) first carpenters and then masons enjoyed the same increase from 4d to 5d as early as 1401-05. At the urban Winchester College (Box F.8), wages for master carpenters had risen to 6d per day without food by 1398 (4d daily with food); but for master masons, the mean rate did not reach 6d daily (without food) until 1409. See also the raw-wage data published in Rogers 1866-1902, vol. I: 1259-1400, pp. 272-34; and vol. IV: 1401-1582, pp. 514-23.

28. Ritchie 1934 (cited from the reissue in revised form in Carus-Wilson, ed. 1954-62, vol. II, pp. 91-112). Data from presentments before Justices of the King's Bench at Brenwood in November 1389, following the 1388 Statute of Cambridge. As she also notes (p. 102), 'eight hundred men who were receiving illegally high wages is not a large number for a county the size of Essex.' She also noted daily wage payments of 4d with food, for tasks in the Winchester manorial accounts that are specifically listed as 'without food'.

indeed for winter months as well as for the summer. At Westminster Abbey, however, the rate was less, at 6 2/3d per day, though with some extra material benefits not given to the Tower Bridge craftsmen.

These rather complex data indicate that the commonly expressed views about post-Plague wages in England are much oversimplified, in particular the comment in a recent article by Simon Penn and Christopher Dyer: that 'the evidence for a rise in both cash wages and real wages ... coinciding with the sudden and sustained population decline after the Black Death of 1348-9 has been well established'.<sup>29</sup> What must be challenged in this statement (and article) is the verdict on real wages, for the very simple reason that the Black Death, not only in England but throughout Western Europe, was followed by a horrendous inflation that lasted for at least the ensuing quarter-century. Thus, as the Table 2 clearly indicates, its initial consequence was to swamp the rise in nominal wages for most workers, but even for England's urban craftsmen (certainly in the small to middle-sized towns), and certainly for most of the manorial craftsmen and other artisans. As Table 2 also indicates, the real wages for master masons and carpenters at Oxford, and Cambridge (and also Canterbury and Exeter, etc.) fell, not rose, in the immediate aftermath of the Black Death and then recovered somewhat during the 1350s, only to decline again slightly in the 1360s. They did not in fact regain the level that had been achieved in the mid-1330s until about the mid-1370s. Many manorial craftsmen in many manorial estates, especially those of the far flung holdings of the Bishop of Winchester, had to wait until the early fifteenth century to achieve a significant gain in their real incomes (at least those measured in terms of wages given without food and drink): at Battle Abbey, Redgrave manor, Hinderclay, Itchingswell (Ecchinswell), Overton, Taunton, Esher, Wycombe, and also Winchester College, to name only a few.<sup>30</sup> The post-Plague European inflation, which was even more severe and longer lasting in Flan-

29. Penn and Dyer 1990.

30. Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection: boxes A.31 (Taunton), A.32 (Esher), A. 33 (Itchingswell, Overton, Wycombe), F.8 (Winchester College), G.14 (Hinderclay and Redgrave), H.10-11 (Battle Abbey).

ders than in England (and in Tuscany, as well), was again clearly a monetary phenomenon. Depopulation, after all, according to some disciples of the Postan school, is supposed to cause deflation – not the opposite.<sup>31</sup>

### **The monetary causes of rising prices and nominal wages**

The monetary reasons – if we properly relate monetary and real variables – are not difficult to seek. As David Herlihy so aptly commented, ‘men were dying, but coins were not’ (at least not so quickly).<sup>32</sup> Thus, whatever the current status of Western European precious-metal mining, the effect of such drastic depopulations, perhaps as much as 40 percent of the total inhabitants, from bubonic and pneumonic plagues, if not so much from warfare, was undoubtedly to augment dramatically the per capita supplies of coined money. In terms of the modernized version of the Fisher Identity, i.e.,  $M.V = P.y$ , if the real variable  $y$ , representing Net National Income, contracted so much more rapidly than did the volume of money payments (i.e., the product of  $M.V$ ), then obviously prices had to rise. The same conclusions are to be drawn in using the preferable Cambridge ‘cash balances’ approach: so that  $M = k.P.y$  (in which  $k = 1/V$ ), so that a reduction in  $y$  (NNP) had to mean a corresponding rise in  $P$  and/or  $k$ .

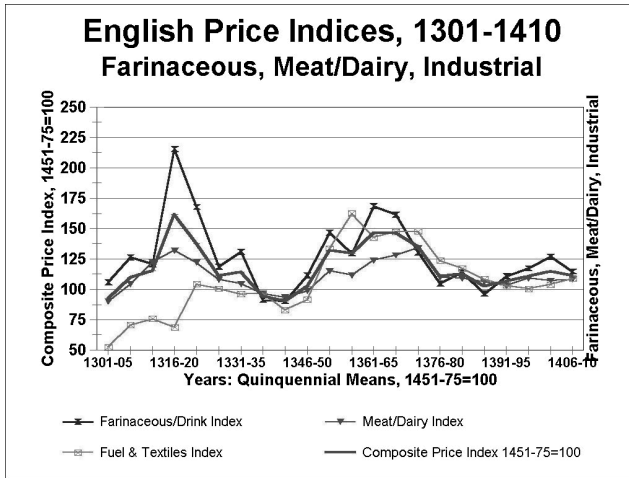
Secondly, the fiscal consequences of warfare in Western Europe (including the concurrent Italian wars), of increased taxes and other levies, probably also induced some considerable dishoarding. At the same time the French, Flemish, Brabantine, Spanish, and various Italian governments, to mention only a few, sought both to finance and to facilitate the necessary cash flows for warfare by engaging in drastic coinage debasements, some severe enough to promote a veritable ‘flight from coinage’. The English crown, however, was a singular exception to these monetary manipulations: for it undertook only one, relatively minor weight-reduction in its

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31. For the inflation in Flanders, see Munro 1984(a); for Tuscany, see Herlihy 1967, pp. 122-30.

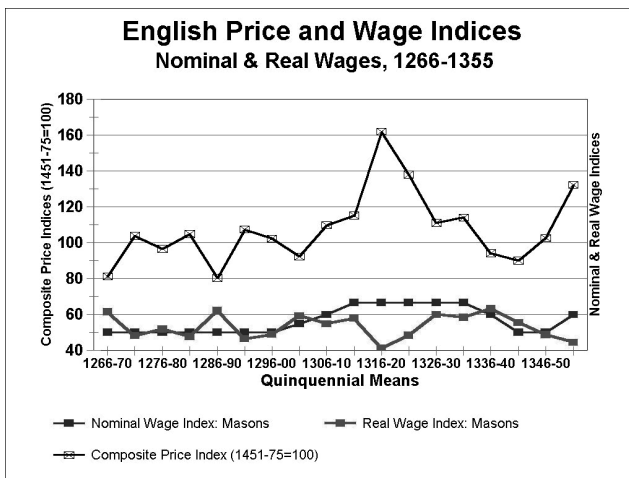
32. Herlihy 1967, p. 125.

Figure 1. English prices, 1301-1410



Source: British Library of Political and Economic Science, Archives, Phelps Brown Collection, Box Ia. 324, Box J:III.2a; Phelps Brown and Hopkins 1956 (reprinted in Phelps Brown and Hopkins 1981, pp. 13-59).

Figure 2. English prices, nominal wages, and real wages 1266-1355



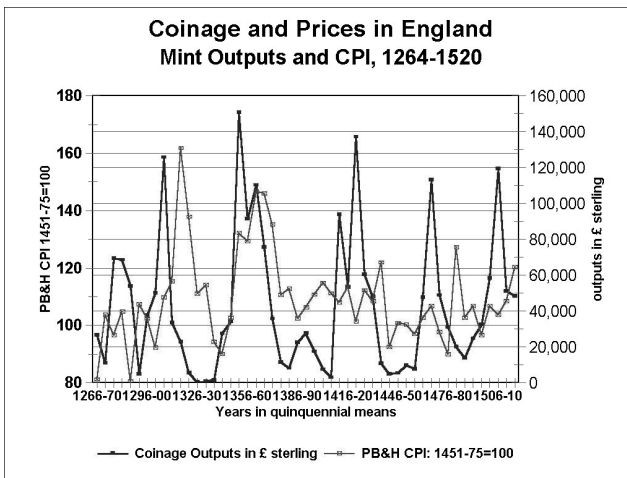
Source: British Library of Political and Economic Science, Archives, Phelps Brown Collection, Box Ia. 324, Box J:III.2a; Phelps Brown and Hopkins 1955 and 1956 (both reprinted in Phelps Brown and Hopkins 1981, pp. 1-59).

Figure 3. English prices, nominal wages, and real wages, 1321-1420



Source: British Library of Political and Economic Science, Archives, Phelps Brown Collection, Box Ia. 324, Box J:III.2a; Phelps Brown and Hopkins 1956 (reprinted in Phelps Brown and Hopkins 1981, pp. 13-59).

Figure 4. English mint outputs and the Consumer Price Index (Phelps Brown and Hopkins), 1264-1520



Source: For prices, see sources for figures 1-3, and for the mint outputs, see Crump and Johnson 1913; Brooke and Stokes 1929; Challis 1992; Munro 1973, Appendix I, Tables A-B, pp. 188-97; and Munro 1981, 1983 and 1984(a) (all reprinted in Munro 1992).

silver coins, in 1351, thereafter maintaining a perfectly stable coinage, in both metals, until 1411-12.<sup>33</sup>

Thirdly, as some historians have suggested – citing Italian literature (e.g., Boccaccio's *Decameron*) and paintings, adornments in dress and housing – the socio-psychological consequences of both plague and warfare, especially with such devastating and arbitrary death tolls, was to foster a fatalistic yet hedonistic spending spree, facilitated all the more by suddenly inherited cash balances.<sup>34</sup> The overall consequences, as demonstrated in Table 3, was to produce a very large increase in coinage outputs, whose inflationary consequences can hardly be disputed. One will note from Table 2 that all three major price series – for grains, meat-fish-dairy products, and industrial goods – rose during this quarter-century period following the Black Death, to the late 1370s in England. Clearly many labourers, artisans, and craftsmen, those living from money-wages alone, did suffer a reduction in real incomes with such rampant inflation.

### **The problem of determining post-Plague real wages**

Nevertheless many historians may well doubt that these money-wage and price statistics tell the whole story about labour markets and real wages. On the one hand, many believe that the 1349 Ordinance and the 1351 Statute of Labourers did prevent a further rise in money wages, one that would have entitled these craftsmen to earn the real wage that the post-Plague depopulation and obvious changes in the land:labour ratio should have provided them. Furthermore, several scholars – most notably Putnam, Ritchie, Hatcher, Penn and Dyer – have provided strong and convincing evidence that the Crown and local authorities did seek to enforce these statutes, at least until the late 1380s, though notably such evidence becomes very scarce thereafter.<sup>35</sup> Others, however, believe

33. See Feavearyear 1963, pp. 15-45; and various essays in Munro 1992. For the coinage outputs in this period, see Table 3.

34. See in particular: Miskimin 1975, pp. 25-32; Herlihy 1967, pp. 55-71, 180-212; Lopez 1962; Boccaccio 1921: Introduction, especially p. 7; Cassell 1982-89.

35. The classic study remains Putnam 1908. See also Hatcher 1994; Penn and Dyer 1990; Ritchie 1934.

that the manorial accounts deceitfully recorded only the wages that would indicate compliance with the ordinances, but not the actual money wages actually paid.

Yet a close examination of the available wage evidence in numerous manorial accounts does not really substantiate such a view of enforcement of the statutes, for virtually all of them demonstrate that most of the wide variety wages so recorded were substantially above those permitted by the 1349 Ordinance and the 1351 Statute of Labourers.<sup>36</sup> Why would the manorial lords feel free to *pay and record* these higher wages, even if a few other manors paid or recorded wages corresponding to the Statute? Furthermore, in most manors, including those in the latter small category that paid wages in accordance with the Statute, some craftsmen, evidently senior and/or more skilled, received wages that were 25 percent to 50 percent in excess of permitted rates.

Furthermore, as just noted, London and then other later-medieval English towns, with presumably a higher cost of living, readily permitted wages above those prescribed in the Ordinance and Statute of Labourers. By the 1370s, most employers of building craftsmen in London were ignoring not only the Statute of Labourers, and the 1388 Statute of Cambridge, but also their local civic ordinances on maximum wages, as the evidence just cited clearly shows.<sup>37</sup> Not until 1495 did Parliament recognize London's special status within the kingdom, and its much higher cost of living, with legislation to authorize these very same rates of 6d and 5d per day, respectively (but only 4d daily with food and drink), with some minor exceptions.<sup>38</sup>

Possibly, however, the true real wage was actually higher than indicated by the recorded money wages, if workers also received a supplement in kind: in food, drink, and or clothing. Indeed, in many manorial accounts, especially the Winchester accounts, wage

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36. Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection, boxes A.31 (Taunton), A.32 (Esher), A. 33 (Itchingswell, Overton, Wycombe), F.8 (Winchester College), G.14 (Hinderclay and Redgrave), H.10-11 (Battle Abbey).

37. See nn. 21-22 above.

38. Statute 11 Henrici VII c. 22 (1495), in Tomlins et al., eds. 1810-22, vol. II, pp. 585-87. The major exception was a maximum daily rate of 7d, summer and winter, for those senior or chief master masons and carpenters employing or supervising six or more men; or a rate of 5d daily, with food and drink.

payments in kind were quite common, often accounting for 50 per cent of the total wage package, but only up to the eve of the Black Death. Thereafter, the food-and-drink components fell to a third or less of the total pay package and they became less common in the following generations, except principally at Battle Abbey. The Battle Abbey manorial accounts generally provide two series of wage payments for the same classes of craftsmen and agricultural workers: those paid in both money and kind, and those paid in coined money alone. The sum of the former seems to equal the latter; and the rates for those paid in money alone at Battle Abbey were identical or virtually identical to those for unspecified but presumably 'money-alone' wage payments on other manors.<sup>39</sup> Furthermore, even the national wage statutes recognize such a difference between wage payments in money alone, and thus with a lower money wage combined with food and drink. In any event, one may well surmise that when the price of foodstuffs fell sharply in the late fourteenth century (see tables), labourers and artisans would have resisted having any substantial portion of their pay package supplied in kind.

There are very few available urban wage data before the Black Death; but for later-medieval London and other smaller English towns (Canterbury, Dover, Exeter), I did not find any significant evidence of payments in kind, other than some allotments of clothing (chiefly and only significant for master-masons and some carpenters in long-term employ at Westminster Abbey).<sup>40</sup> For these reasons, one may conclude that wage payments in kind did not appreciably alter the picture of real wages constructed by using money payments alone, at least not for the later Middle Ages, even if such views are not endorsed in John Hatcher's recent (1994) and otherwise persuasive article discussed above.<sup>41</sup>

Finally, John Hatcher and other historians have suggested that the post-Plague rise in real wages took place partly by a substitution of leisure for paid work. Many historians have suggested that,

39. Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection, Battle Abbey: Alciston Manor, 1336-1487 (Boxes H.10-11). See also n. 31 above.

40. Archives of the British Library of Political and Economic Science, Beveridge Price and Wage History Collection, Westminster Abbey: 1393-1541 (Box P.10).

41. Hatcher 1994.



in pre-Industrial societies especially, many artisans, craftsmen, and labourers had a 'backward bending supply curve of labour'. Thus, many workers, on finding that their real wages had risen to permit them to acquire some desired level of sustenance and comfort, would have preferred to enjoy increased leisure time over further increases in money income; and thus they would have chosen to work less, or to refuse to work for traditionally long hours.<sup>42</sup>

In medieval and early-modern Europe, and indeed up to modern times in many regions, the payment of wages took two forms. The much more common form was piece-work wages: i.e., wages paid for the amount of product produced. That form was almost universal in the textile industries and in agriculture: payment for the number of yards of yarn spun and cloth woven, acres of grass mown, bushels of wheat reaped. Evidence on piece-work wages is, however, scarce and difficult to use. Historians really have no accurate way of knowing whether the amount of labour expended for piece-work wages rose or fell after the Black Death. Less common, though almost universal in the building trades, were money wages based on the time employed; but throughout Europe, such employees received time-work wages commonly by the week and then more commonly by the day, but certainly not by the hour.

Thus one may conjecture that if labourers and artisans had enjoyed more bargaining power with presumed labour scarcities after the Black Death, they may have used that power to secure a reduction in the number of hours worked per day. The research that I myself have done on this question may be found in a recent publication on seasonal wages and leisure in late-medieval England and the Low Countries.<sup>43</sup> For neither region did I find any convincing evidence that urban craftsmen sought to increase their leisure time, even after real wages had peaked in the mid-fifteenth century, by reducing either the work day or the work week, which was usually six full days. Indeed evidence on the length of the working day may be found from evidence on seasonal wages, which were clearly paid on the basic principle that 'man works

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42. For an example in the late-medieval English mining industry, many of whose rural workers were seasonal, primarily engaging in the agrarian economy, see Blanchard 1978.

43. Munro 1994.

from sun to sun'. The stipulation that both men and women were required to work at least twelve hours during the summer months can be found in the 1495 parliamentary statute on maximum wages. From mid-March to mid-September all English 'artificers and labourers' were to work from 5:00 a.m. to 7:30 p.m., with 30 minutes for breakfast, 30 minutes for *nonemete* (or sleep) and one hour for dinner; and in the other half of the year, they were to work from sunrise to nightfall.<sup>44</sup> If the statute does not stipulate the hours of work for the other six months, we may deduce from earlier English evidence and from continental evidence that the normal length of the work day during winters months was shorter. In parts of the late-medieval Low Countries, for example, the winter wage was only two-thirds of the summer wages, for the simple reason that the number of hours of daylight during winter months at this latitude (50° N) is about eight hours.<sup>45</sup>

In London, and some other English towns, however, seasonal wages generally disappeared after the Black Death, as the records of building accounts clearly indicate, even though the official ordinances still stipulated a lower winter wage (see Table 1).<sup>46</sup> Quite possibly the payment of a uniform wage rate, i.e., a winter wage equal to the summer wage, came to be an acceptable method of circumventing the Statute of Labourers' wage controls, since the Statute and its enforcement really focused only the summer maxima.<sup>47</sup> Possibly the combination of the consequently higher wage

44. Statute 11 Henrici VII c. 22, in Tomlins et al., eds. 1810-22, vol. II, pp. 585-87; repeated in 6 Henrici VIII c. 3 (1514-15), in Tomlins et al., eds. 1810-22, vol. III, pp. 124-26. The framers of the 1495 statute, however, evidently believed that too many wage-earners were stealing leisure time during working hours by *late commying unto their worke, erly departing therfro, long sitting at ther brekfast, dyner, and nonemete, and long tye of sleping at after none*.

45. See Sosson 1977: citing guild statutes in Rijksarchief Brugge, Ambachten, no. 1: *dat hi sculdich es te werkene van nuchtens toten avonde also wel tsaterdaechs up vighelie avond als up anderen daghen....* Similarly the Bruges carpenters guild forbade them *te weerkene ... by avonde of bi nachte met keersen* [candles]. See other guild records that specify working hours in the textile trades (forbidding work by night), in Delepierre and Willems, eds. 1842; Espinas and Pirenne, eds. 1906-20.

46. See the London ordinance of 1350, in setting maximum summer and winter rates (6d and 5d respectively); and also the Statute 23 Henrici VI, c. 12, of 1444-45, cited in n. 41 above, and in Table 1.

47. The subsequent Statutes of 1444 and 1495 did more clearly specify a winter maximum wage, lower than the stipulated summer wage.

throughout the entire year may have permitted some such substitution of greater leisure, at least in the summer months, for paid work.<sup>48</sup> Since, however, there is no evidence of any reduction in the normal working day in England until the passage of Fielden's Law or the Ten-Hour Day Act in 1847, the more likely result was that, after the Black Death, many labourers, craftsmen, and artisans received their real wage increase during these winter months, with shorter daylight hours.<sup>49</sup>

### Conclusions

Subsequently, the very striking changes in money supplies, coinage, prices, and real wages that took place during the final quarter of the fourteenth-century deserve at least some parting comment. For, not only England, but also most regions of Western Europe – certainly including the Low Countries, Tuscany, and Aragon-Navarre – experienced an equally dramatic deflation that lasted until well into the fifteenth century, though generally becoming much more moderate by the early decades.<sup>50</sup> In England, itself, as Table 3 clearly shows, this period of pronounced deflation was accom-

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48. In the mid-fifteenth century, however, the London Bridgemaster did introduce a slight differential in seasonal payments (1441), and one that effectively raised the annual wage. In 1441: by reducing the uniform daily rate to 7½d (or even 7d for some) for the winter season (three months), while raising it to 8½d for the rest of the year. Corporation of London Record Office, London Bridgemaster's Accounts, Weekly Payments, First Series, vol. IV. Unfortunately these accounts cease in 1445. See also Knoop and Jones 1933 and 1967, pp. 105-06.

49. See R. Campbell 1747, pp. 331-41. In specifying hours of work for 380 crafts, this treatise indicated that the typical working day still remained a very long one: from 6:00 a.m. to 8:00 p.m. (or during all 'daylight' hours). Subsequently, the 1833 Factory Act had stipulated a maximum working day of nine hours for children, aged nine to thirteen; and for those aged thirteen to eighteen, a maximum of 69 hours a week, with no more than 12 hours per day. The 1844 Factory Act limited the working day for women to 12 hours per day, and for children aged eight to thirteen, to 6.5 hours. Fielden's Act, imposing a limit of ten hours per day for both women and men (implicitly), was passed at a time of great labour unrest, on the eve of the 1848 Chartist's Revolt. See Clapham 1964, pp. 572-78.

50. Herlihy 1967, pp. 128-30; Hamilton 1936, Appendices; Munro 1981, 1983, 1984(a), 1984(b) and 2003(b).

panied by a severe slump in the gold and silver coinage outputs, almost as severe as those for the early fourteenth-century.<sup>51</sup>

The explanations – again chiefly if not exclusively monetary – for this severe slump in coinage outputs and for the related deflation lie beyond the scope of this study. It should be noted, however, if only to intrigue interest in companion studies, that this late fourteenth-century deflationary era also witnessed a sharp rise in the real wages of building craftsmen, but chiefly because their money wages remained stable, while prices fell, so that they were able to buy more goods and services with the same wages.<sup>52</sup>

Finally, for an examination of the pattern of real wages during any part of the late-medieval era, especially, but also for much of the early modern era, historians should recognize the fact that the proportion of the population living from money-wages alone was rather small.<sup>53</sup> Many craftsmen and artisans receiving money wages had their own small agricultural holdings, if only vegetable gardens with their homes; and many masters, if not labourers, were often also petty merchants in their professions, often earning profits that exceeded their wages.<sup>54</sup>

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51. The sources of the mint data used in these tables, may be found in: Challis 1992; Brooke and Stokes 1929; Munro 1973, Appendix I, Tables A-B, pp. 188-97; Munro 1981.

52. Munro 2003(b) and 2005.

53. Penn and Dyer recently commented as well, to stress the importance of this issue, that 'at least one-third of the population of late medieval England gained all or a part of their livelihood from earning wages'. Penn and Dyer 1990, p. 356, citing in particular Hilton 1985. That argument would be more persuasive if they had qualified to read: 'gained part or all', or better 'part if not all' of their livelihood.

54. See, for example, Woodward 1981 and 1995.

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