

Money and Prices in England from Henry II to Edward III

By N J MAYHEW

IN A recent article, Dr Bridbury has done monetary history and numismatics the great service of placing it at the centre of the debate about the behaviour of prices in England before the Black Death.¹ It is perhaps not too great a simplification of his paper to say that his preliminary examination of the subject led him to expect money supply to provide some crucial answers, but in the end his expectations were sorely disappointed. It is hoped that the following paper may go some way to satisfy his expectations of monetary history and to alleviate his disappointment in it. It is argued that the study of the money supply does significantly aid our understanding of the behaviour of prices, as Bridbury expected it should. To this end recent work on money supply is summarized, which provides additional data not used by Bridbury. Additionally a technique is advanced which may aid the analysis of price trends by neutralizing the effect of variable yields. As Bridbury observes, too often in the past yields have been invoked in one year to explain an unusual price, but ignored in others when the yield factor was equally important.² It is suggested that if adequate and consistent allowance is made for variable yields, and up-to-date information on money supply employed, monetary history can indeed make an important contribution to the prices debate.

A number of caveats is called for, however. Year-by-year analysis of price changes, from aggregated data primarily intended to be viewed in a broader sweep,

may at times be asking too much of the price information at our disposal. And secondly it must always be remembered that the medieval economy was not a perfect free market. For both these reasons we should not perhaps look for too perfect a correspondence between our theoretical expectation and the actual behaviour of prices as far as they are known to us.

A further important limitation of the analysis which follows concerns credit, for which no allowance has been made. There can be no doubt that in the period under consideration it did come to play an important part not merely at international but also at local level. It seems clear, however, that credit — in the sense of cash advances — followed the behaviour of the money supply. Lending does not contract in times of a glut of coin or expand in times of scarcity. Thus credit reflected the supply of coin rather than compensated for it. However, most peasant credit probably did not involve cash advances. Manor court rolls suggest that a clear majority of peasant debt concerned credit sales or unpaid wages.³ In a relatively locally-based and immobile society shortage of coin was most effectively eased by doing without it — by owing money for goods and services taken unpaid for. This raises the whole question of the nature of payments and demand for coin in medieval society which were expressed in the Fisher equation ($MV=PT$) as Velocity of

¹ A R Bridbury, 'Thirteenth century prices and the money supply', *Ag Hist Rev*, 33, pt 1, 1985, 1-21.

² *Ibid*, 15-17.

³ R H Hilton, *The English Peasantry in the Later Middle Ages*, Oxford, 1975, 46. For the late fourteenth and fifteenth centuries, Elaine Clark, 'Debt litigation in a late medieval English vill', in *Pathways to Peasants*, ed J A Raftis, Toronto 1981, 247-79, especially at 254-5, is useful since it supports similar conclusions with a statistical breakdown of debt cases at Whittle, Essex 1382-1490. Loans of cash were involved in only 8.8% of cases, while cases involving labour and services accounted for 23.7% and 46.6%.

circulation (V) and the level of Transactions (T). It is perhaps safe to assume that both V and T were rising, and to some extent therefore cancelled one another out, but for our present purposes I have confined my attention to M and P because they can be quantified, however approximately.

Another limitation of the present paper is that this study concerns only wheat prices. Obviously a thorough review of the prices of other grains and of livestock and livestock products would extend the scope of this paper beyond reasonable limits, but the point is an important one because it has been suggested that variable price movements for different commodities argue against the possibility of a monetary impact on prices. The influence of money supply on prices would, it is argued, have been general. Some extremely sophisticated versions of the quantity theory of money are now available,⁴ but this particular objection was forcefully disposed of long ago.⁵ In fact different commodities have variable elasticities of supply and demand. A man experiencing a change in purchasing power does not continue to buy commodities in the same proportions as he did before his change in circumstances. However, it is not in any case the contention of this paper that money supply was the only important influence on prices, but rather that monetary factors should always be given serious consideration. To this end, an estimate of English money supply is an essential first step.

I

Information on the money supply has the advantage of being quantifiable, and of relating to the whole country rather than to

a restricted geographical or social segment. Thus when Henry III ordered the recoinage of the domestic money supply in 1247, half of it was struck at provincial mints.⁶ It is true that the location of provincial mints does indicate a southern and eastern bias, but this largely reflects the distribution of population. The distribution of wealth as viewed through tax returns suggests that it was closely linked with the distribution of population,⁷ and there is no evidence that by the thirteenth century the regions had the use of less coin than their population and economic life would have entitled them to.

The integrity of the English monetary system — that is the extent to which only English coin circulated in England — also makes it especially amenable to a quantitative approach. However, Bridbury has postulated the existence of a large body of extra coin in England, so it is necessary to look closely at his suggestion that 'we must expect to find that there was a great deal more foreign money or unauthorized English money in the form of counterfeit or token money circulating than we had thought possible; and we must also expect to find that the stock of money accumulated in the economic system as a result of previous mint issues was much larger than we were given to understand that it could have been'.⁸ In fact this surmise is offered as an explanation for the failure of prices to respond to monetary factors in the expected way, and it is the contention of this paper that prices did so respond. If that can be demonstrated, the logical foundation for this hypothesis disappears. Nevertheless, so that full confidence can be placed in the estimates of money supply which follow, it is necessary to dispense with these phantom sources of extra money. This can best be done by reference to the finds which provide

⁴ Dennis O'Flynn, 'Use and Misuse of the Quantity Theory of Money in Early Modern Historiography', in *Münzprägung, Geldumlauf und Wechselkurse*, Akten des 8th International Economic History Congress, Section C7, Budapest, 1982, eds Eddy von Cauwenberghe and Franz Irsigler, Trier, 1984, 383–417.

⁵ W C Robinson, 'Money, Population and Economic Change in Late Medieval England', *Econ Hist Rev*, 2nd ser, XII, 1959, 63–76; R B Outhwaite, *Inflation in Tudor and Early Stuart England*, 1969, 45–6.

⁶ And this is to count Canterbury as a metropolitan mint.

⁷ R E Glasscock, *A New Historical Geography of England before 1600*, ed H C Darby, 144. Also R A Donkin, *ibid*, 81.

⁸ Bridbury, *op cit*, 18.

many thousands of examples of medieval English money of all types for our examination.

Foreign coins are found in later medieval England, but except at certain well known periods — the 1290s (crockards and pollards), the 1340s (lusshebournes), the 1400s (galley halfpence) — they are not quantitatively significant.⁹ The fact that when they do intrude more significantly we meet them in the documents, in the hoards, and as stray finds, suggests that if and when foreign coins do play an important part then we know about them. A partial exception to this statement may perhaps be allowed in the case of gold. The documents suggest that Florentine and French gold may have been present in the City and at court in the early fourteenth century, and that this use of foreign gold may have encouraged Edward III to introduce his own gold coinage in 1344 and dictated the levels of valuation he chose for it.¹⁰ The high individual value of florins (about 3s sterling) as opposed to silver pennies, may explain why they were not frequently lost and have not therefore been found in England. However, since English gold is found, it seems likely that Italian gold was never widespread in the country at large in the way that crockards, pollards, lusshebournes and galley halfpence were.¹¹ The finds do tell us enough about the circulating medium for us to say confidently that there was no large pool of foreign coin in England except at the limited periods of which we already know.

The question of counterfeit or token money may also be discussed in the light of the finds. Hoards might reasonably be expected to exclude such items, so stray finds are especially important. Jettons or casting counters have always been found in large numbers, and some date from the late thirteenth or fourteenth century. There is no evidence, however, for their use as money,¹² and we know nothing about any arrangements, formal or informal, for their convertibility with silver. Since many of these early English jettons were struck by the government (for use as counters in the exchequer) we might confidently have expected some contemporary recognition of their role as money if they had been used as such. Lead or pewter tokens are found, though not as commonly as jettons. They have been authoritatively associated chiefly with religious institutions, and with taverns, but it has been pointed out that they seem to have been used mainly as a 'chit-for-service' rather than as a fraction of a farthing with any wide currency.¹³ Similarly counterfeits are found in small numbers in hoards, and as strays, especially in the Thames, but it is difficult to believe that they ever amounted to more than a tiny proportion of the total currency.¹⁴

Finally, Bridbury resurrects Postan's notion of accumulated silver stocks when he speaks of 'the stock of money accumulated in the economic system as a result of previous mint issues'. Between the accession of Henry II and the death of Edward I, the outward appearance of the coinage was altered four times, in 1158, 1180, 1247, and 1279. The alteration in design meant that the previous type could be effectively demonitized, since the old type was easily

⁹ For crockards and pollards and lusshebournes see N J Mayhew, *Sterling Imitations of Edwardian Type*, 1983, and for galley halfpence see P Spufford, 'Continental coins in late medieval England', *British Numismatic Journal* (hereafter *BNJ*) 32, 1963, 127–39. For a later fifteenth-century example of the phenomenon see P Spufford, 'Burgundian double patards in late medieval England', *BNJ* 33, 1964, 110–17.

¹⁰ Before the introduction of British gold coinage, facilities were established for the exchange of foreign gold for English silver. See N J Mayhew, in the forthcoming *History of the Mint*, CUP, ed C E Challis.

¹¹ Flemish nobles entered England in significant quantities at the end of the fourteenth and beginning of the fifteenth centuries, and examples have been found here. Spufford, 'Continental coins . . .', 129–32.

¹² Michael Prestwich, 'The crown and the currency: the circulation of money in the late thirteenth and early fourteenth century England', *Numismatic Chronicle* (hereafter *NC*), 142, 1982, 64.

¹³ Michael Mitchener and Anne Skinner, 'English tokens c1200 to 1425', *BNJ*, 53, 1983, 29–77.

¹⁴ Michael Mitchener and Anne Skinner, 'Contemporary forgeries of English silver coins and their chemical compositions: Henry III to William III', *NC*, 145, 1985, 209–36.

distinguishable from the new. The hoards from these two centuries demonstrate beyond a shadow of a doubt that over 95 per cent of the currency consisted of coins of the 'new' type appropriate to the date of the hoard.¹⁵ Hoards from outside Britain, containing sterling do contain larger numbers of earlier types,¹⁶ but this merely confirms our certainty that if earlier issues were still playing a significant part in Britain, the finds would tell us of it. In fact they do not. The numismatic evidence is quite clear on this point; England's money supply was totally dominated by issues of the current type. Indeed it is even possible to show that within the issue of a single type, more recent issues tend to predominate over the earlier coins, chiefly because over time large quantities of English coin were lost or carried abroad in trade and war.¹⁷

II

Confident, therefore, that the vast majority of the money circulating in England was official English coin, we may now advance to the estimates of the English money supply 1158–1351 which appear in Table 1.

Documentary evidence for mint output survives for England from the 1220s;¹⁸ additionally, output under the earlier Angevins has been estimated¹⁹ and estimates of the likely amount of coins in circulation — as distinct from output, much of which did not remain in circulation — are provided for a number of fixed points through

the thirteenth and fourteenth centuries. Attention is drawn to the notes to the Table, which detail not only the sources of these estimates, but also point out that the individual figures are not always strictly comparable with one another. This is partly because different methods have been used to arrive at some of the figures, and also because provincial mint output is not always included. The general trend, however, is valid.

These estimates of the English currency are endorsed by the archaeological evidence for site finds of coins, collected and analysed by Rigold.²⁰ Rigold's evidence came from 100 archaeological sites, and his findings are summarized in Table 2. He originally provided totals of coin finds for ten coinage periods, of which only periods III to VI concern us now. Rigold also adjusted the raw coin find totals to give a mean loss per decade for each period. The total for period VI (Edwardian) was reckoned to be inflated by some 10 to 15 per cent by coins of Edwardian type used and lost after the end of that period.²¹ The Edwardian totals have therefore been reduced by 15 per cent, giving an adjusted mean loss per decade of 23.8. The final row of figures in Table 2 shows the earlier phases as a proportion of the Edwardian total.

These figures for relative coin loss compare well with the estimates of total circulation (Table 1). There is perhaps some slight under-representation of Short Cross (1180–1247) finds compared with the estimates of circulation. To the extent that loss correlates with use, this may suggest that Short Cross supply was running ahead of demand, ie at this time they were making more than they were using. More extensive analyses of stray find evidence need to be made before conclusions of this sort can be pushed further.

¹⁵ The English hoard evidence may most easily and quickly be surveyed by reference to J D A Thompson, *Inventory of British Coin Hoards AD 600–1500*, 1956, augmented for more recent finds by the *British Numismatic Journal*, the *Numismatic Chronicle* and *Coin Hoards*.

¹⁶ N J Mayhew, *Sterling Imitations of Edwardian Types*, Appendix 2, lists foreign hoards containing Edwardian type sterlings; a number of these hoards also contain earlier types.

¹⁷ N J Mayhew, 'Numismatic evidence and falling prices', *Econ Hist Rev*, 2nd ser, XXVII, 1974, 1–15.

¹⁸ C E Blunt and J D Brand, 'Mint output of Henry III', *BNJ*, 39, 1970, 61–6 and C G Crump and C Johnson, 'Tables of bullion coined under Edward I, II, III', *NC*, 13, 1913, 200–45.

¹⁹ D M Metcalf, 'A survey of numismatic research into the pennies of the first three Edwards', in *Edwardian Monetary Affairs*, 1279–1344, ed N J Mayhew, *BAR* 36, 1977, esp pp 6–7; N J Mayhew, 'Frappes de monnaies et hausse des prix de 1180 à 1220', in *Études d'Histoire Monétaire*, ed John Day, Lille, 1984, 159–77.

²⁰ S E Rigold, 'Small change in the light of medieval site-finds', in *Edwardian Monetary Affairs* 1279–1344, 59–80.

²¹ Edwardian pennies, in contrast with earlier issues, continued in circulation during later periods because the type was not changed.

TABLE I
English currency estimates 1158-1377

Date	Mint output	Estimated circulation
1158-1180	£125,000 ^a	
1180-1191	£300,000 ^b	
1191-1205	£200,000 ^{b?}	Heavy losses 1190-1204 1205 c£250,000
1205-1210	£240,000 ^{b?}	
1210-1218	£200,000 ^{b?}	1218 c£300,000 ^c
1220-1247	£667,000 ^d	1247 c£400,000 ^f
1247-1250	£552,827 ^e	
(Scotland c1250)		c£50,000-80,000 ^j
1250-1278	£1,154,242 ^g	1278 c£674,053 ⁱ
(Scotland c1280)		c£130,000-180,000 ^j
1279-1290	£1,172,655 ^h	
1290-1299	£51,280 ^k	Heavy Loss 1294-8 1298 c£400,000 plus £200,000 ^l crockards and pollards
1299-1307	£636,432 ^m	
1307-1327	£580,516 ⁿ	1311 c£1,100,000 ^p 1324 c£1,100,000
1327-1343	£37,861 ^k	Heavy losses 1337-43
1343-1351	£94,734 ^k	1350 c£500,000 ^p

For full details of these publications, see the notes to the text.

a. Metcalf, *Edwardian Monetary Affairs*

b. Mayhew, *Études d'Histoire Monétaire*

c. The recoinage of 1205 consisted in large measure of recoinning clipped and worn Short Cross pennies of the period 1180-1204. Coin was exported extensively by the Crown in the interests of war, ransom, and diplomacy in the period 1180-1218 and sterling was also no doubt carried abroad in trade. It is for all these reasons that an estimated output of some £940,000 in the period 1180-1218, resulted in an estimated circulation of only £300,000 around 1218.

d. Mint output figures for London and Canterbury, Blunt and Brand.

e. Archibald, *Edwardian Monetary Affairs*, p 172. This estimate is based on the surviving mint output figures for London and Canterbury, with an allowance for likely provincial mint output during the Long Cross recoinage.

f. This is an estimate of the Short Cross coinage available for recoinage 1247-50. During the 1240s about £50,000 of foreign silver was coined at London and Canterbury each year. Therefore, allowing for, say, £150,000 foreign silver coined 1247-50, the rest of the £552,827 estimated output during this recoinage may have been old Short Cross in circulation c1247. Because of wear, however, it is likely that more than £400,000 of Short Cross coin was required to make £400,000 of Long Cross.

g. Archibald, *op cit*, p 174

h. Archibald, *op cit*, p 182

i. Archibald, *op cit*, p 183

j. Mayhew, *Coinage in Medieval Scotland*, ed D M Metcalf, Oxford 1977, p 92

k. Crump and Johnson, London and Canterbury mints only.

l. Mayhew, *Sterling Imitations of Edwardian Type*, 1983, p 24

m. Crump and Johnson, with no allowance for Bury and Durham mints whose accounts have not survived.

n. Crump and Johnson, amended. London and Canterbury only.

p. Mayhew, 'Numismatic evidence and falling prices in the fourteenth century', *Econ Hist Rev*, 2nd ser, 17, 1974, p 7.

Thus money supply in England increased dramatically at the end of the twelfth century, grew gradually through the thirteenth century, peaked sharply in the early years of the fourteenth century, and then fell back before the plague. The third quarter

of the fourteenth century saw plentiful supplies of coin in England, though the very large quantities of gold struck relative to silver may have made the circulation somewhat top-heavy. The picture in Europe as a whole — at any rate as far as the date

TABLE 2

Abstract and summary of Rigold's site-find analysis

<i>Rigold phase</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>
Coin types	Late Henry I to Tealby	Short Cross	Long Cross	Edwardian
Dates	1125?-1180	1180-1247	1247-79	1279-1351
Totals found	26	60	39	196 (166.6)
Totals per decade	4.5	8.0	13.0	28.0 (23.8)
As a proportion of Edwardian loss	18.9	33.6	54.6	100

of the twelfth-century up-turn, and the sustained high levels of the thirteenth century are concerned — was broadly similar.²²

III

The study of prices relative to money supply is complicated by the fact that cereal prices varied sharply from year to year chiefly because of variable harvests. The case of wheat makes a suitable study, since we know a good deal about wheat prices and yields.²³ Beginning from the assumption that wheat yields are a principal determining factor in wheat prices, yields (x-axis) taken from Titow's study of the weather on the Winchester estates were plotted against prices (y-axis). It is important to note that the yield of any year should be linked with the price of the following year. If yields were the only determining factor the resulting scatter graph would give a straight line, but of course other factors were at work as well. The amount of scatter on the graph about the overall trend line indicates the importance of those other factors. It is apparent, for

example, that the likely price for any given yield moved, usually upwards, in the course of the period as a whole. A graph with a single trend line was therefore not as instructive as a series of lines for shorter periods. The resulting individual trend lines provide what may be regarded as mean prices for any given yield in each period (Fig 1). From this graph it is apparent that the general level of wheat prices was at its lowest in the first period (A) 1211-26, rose in the second period (B) 1232-77, fell away markedly in the third period (C) 1283-1302, peaked sharply in the fourth period (D) 1305-32, and fell back somewhat once more in the fifth period (E) 1335-50. While the general level of prices is indicated by the position of the trend line, the angle of the slope may also be important. Thus although prices were higher in the third period (C) 1283-1302 than in the first (A) 1211-26, the angle of the slope was steeper in the first period. The angle of the slope reflects the extent to which prices rose or fell in times of dearth or plenty. In other words, although the level of prices was generally lower in the first period, prices were more elastic, or responsive to changes in yields then, than in the third period. Usually a steeper slope was characteristic of rising prices, a flatter slope of falling prices. The angle of slope, as well as the general level of prices, needs to be examined, when using price data as a possible indicator of demand for coin relative to supply.

Within each separate period the scatter about the trend line is worth closer examin-

²² See the essays by N J Mayhew and Peter Spufford in *Etudes d'histoire Monétaire*, ed John Day, 159-77 and 355-95.

²³ The evidence of prices and yields is taken from J Titow's 'Evidence of weather in the account rolls of the bishopric of Winchester 1209-1350', *Econ Hist Rev*, 2nd ser, XII, 1960, 360-407. Although in some respects the price evidence in D L Farmer, 'Some grain price movements in thirteenth century England', *Econ Hist Rev*, 2nd ser, X, 1957 is to be preferred, on balance it was thought better to take both yields and prices from the same source in the hope of minimizing regional and manorial variations. It should however be noted that even Titow's price and yield data are drawn from slightly disparate sources, the prices coming from five large manors, but the yields being taken from any Winchester manor where they are calculable for the year.

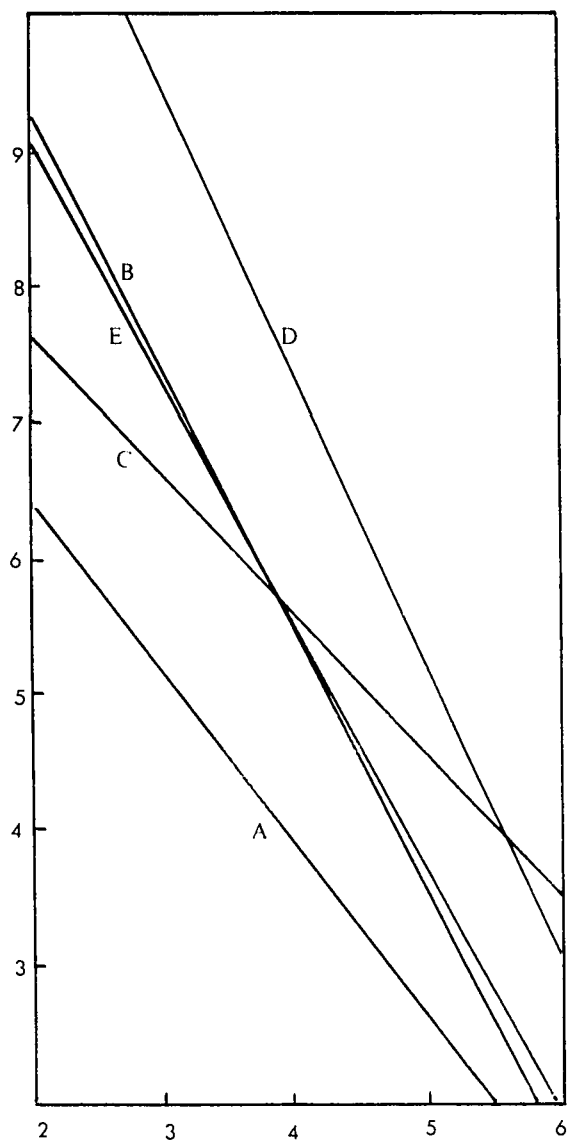


FIGURE 1

Trend-lines for the periods A to E, 1211-1350.
Prices in shillings (y-axis), yields (x-axis).

ation (see Tables A-E).²⁴ In period A it is clear that two years, 1211 and 1224, produced prices more than one standard error of estimate above or below the trend line. However, the standard error of estimate for this period was high (± 1.28 , just over 1s 3d), the data available for only seven

²⁴ The graph is based on a simple linear trend ($y = a + bx$). In some respects a parabola ($y = a + bx + cx^2$) provides a slightly better fit, but the graphs and the commentary which follow refer to a simple linear trend. I am most grateful for the help of Mr David Gomm with these calculations.

years scarce, and there is a real possibility that the earlier years mark a crucial period of transition from lower twelfth- to higher thirteenth-century prices. It is clear that the general level of prices people were accustomed to ask or pay was important, and it took several years for prices to move onto a different plateau.²⁵

In period B, 1232-77, the aberrant years ($\pm$ at least one standard error of estimate from the trend) were 1236, 1253, 1254, 1257, 1271 and 1272. Again the standard error of estimate is high, indicating a wide scatter, but the larger number of years for which data is available is encouraging. The high prices of 1236 and 1257 are for the moment without explanation, but the behaviour of prices in 1253 and 1254, the most irregular prices of the period, may perhaps be explained in terms of post-recoinage deflation. The *Calendar of Patent Rolls* 1247-58 speaks of low prices at this time attributed to 'the present lack of money in England'.²⁶ A recoinage would be deflationary because the previous issue which was worn and clipped was replaced by fewer better coins.²⁷ The normal inflow of foreign silver to the mint could take some years to offset this deflation, especially if a significant proportion of coin brought to the English mint was subsequently re-exported. Monetary factors, chiefly a deteriorating and increasingly clipped currency, may help to explain the higher prices characteristic of the 1270s.

Period C, 1283-1302, had slightly less scatter, the standard error of estimate being just over one shilling. Irregular prices may

²⁵ Bridbury was also struck by these different price plateaux.

²⁶ *CPR* 1247-58, 426. I am grateful to J R Maddicott for this reference dated 1255, and also for drawing my attention to Matthew Paris, *V* (Roll Series), 660, 702 (1257-8).

²⁷ The deflationary effect of a recoinage is one factor which Bridbury anticipated, but was especially disappointed not to find. In fact Farmer observed this expected effect as long ago as 1969, and re-emphasized it as recently as 1983. (D L Farmer, 'Some livestock price movements in thirteenth-century England', *Econ Hist Rev*, 2nd ser, 1969, XXII, 12-13 and 'Crop yields, prices and wages in medieval England', *Studies in Medieval and Renaissance History*, 6, 1983, 139 and note 69.) We can agree with Bridbury in expecting this effect, and with Farmer in detecting it.

be noted for the years 1284, 1286, 1287, 1288, 1296, 1297, 1298 and 1302, though it is apparent that prices in the 1280s were usually below the trend line, while those of the 1290s were above it. If a little more data had been available it might have made sense to divide the period in two. It is possible that post-recoinage deflation arising from the replacement of the old coinage with rather fewer coins of better weight may have contributed to the low prices of the 1280s, while this was also probably a period of considerable illegal export of sterling.²⁸ In the 1290s crockards and pollards and widespread purveyance and government spending at home seem to have inflated prices, though on the other hand it is surprising that the extensive export of coin by government did not depress prices somewhat.²⁹

The dramatic rise in prices in period D, 1305–32, has already been noted and studied by Mavis Mate.³⁰ By regressing prices against yields we can confirm Dr Mate's assertion that the high prices of this period were not a response to poor yields. The calculations for this period exclude the famine years 1315 and 1316. The inclusion of data from these years distorts the trend considerably; by excluding the famine, the resultant trend line has a standard error of estimate of less than one shilling (0.98) as opposed to about 1s 6d. With the famine data excluded, prices are still far higher than anything experienced before, and the slope of the trend far steeper. Aberrant prices occurred in 1306, 1307, 1309, 1327, 1330 and 1331. The low prices of 1306 and 1307 may mark the kind of transition from one price plateau to the next already noted above. Mint output was just beginning to soar at this time. The huge price of 1309,

despite a good yield, most probably results from this massive surge in mint output. Prices went even higher in 1310, but with a much poorer yield this price is closer to the trend line of the period. There is some evidence of mild deflation in the later 1320s, when mint output had almost dried up, but two very high prices were recorded in 1330 and 1331. That for 1331 may probably be explained by the severe drought experienced in eastern England that year.³¹ Yields on the Bishop of Winchester's estates in central southern England were not affected, but if regional shortages promoted inter-regional transport of grain the general level of wheat prices could have been inflated even in areas of reasonable yield.

In the final period E, 1335–50, the standard error of estimate was at its lowest (0.40 shilling), and the scatter accordingly narrow. The general level of wheat prices and the angle of slope shows a marked reduction from the great inflationary period which preceded it. The aberrant years were 1339, 1341, 1346, 1347, and 1350. The low prices of 1339, 1341 have already been noted by Michael Prestwich,³² and interpreted in terms of monetary shortage resulting from a period of very low mint output coinciding with a time of extremely heavy government expenditure abroad. He interprets the decision to raise a tax in kind in the same light, and Maddicott has endorsed these views.³³ This scarcity seems to have been at least partially relieved by the reduction in the weight of the penny and the introduction of gold coinage in 1343/4, but the unusually (for this fifth period) high prices of 1346

²⁸ N J Mayhew, *Sterling Imitations of Edwardian Type*, 1983, 22.

²⁹ Mavis Mate, 'Monetary policies in England, 1272–1307', *BNJ*, 41, 1972, 34–79 and 'The impact of war on the economy of Canterbury cathedral priory, 1294–1340', *Speculum*, 57, 4, 1982, 766–8.

³⁰ Mavis Mate, 'High prices in early fourteenth-century England: causes and consequences', *Econ Hist Rev*, 2nd ser, XXVIII, 1975, 1–16.

³¹ I am most grateful to Mavis Mate for this point, revealed by her work on the estates of Canterbury Cathedral Priory. See especially her paper entitled 'The estates of Canterbury Cathedral Priory before the Black Death 1315–1348', in *Studies in Medieval and Renaissance History* (1985). Dr Mate also notes extensive purveyance at this time on the Canterbury estates, *ibid*, note 28. Naturally purveyance was more severe after 1333.

³² M Prestwich, 'Currency and the economy of early fourteenth-century England', in *Edwardian Monetary Affairs 1279–1344*.

³³ J R Maddicott, *The English Peasantry and the Demands of the Crown, 1294–1341*, Past and Present Supplement 1, Oxford 1975, 48–50. Dr Maddicott marshals an impressive body of contemporary witness to the shortage of coin, its effects on prices, and the choice of a tax in kind.

and 1347 may perhaps be explained partly in terms of very heavy government spending on the provisioning of Calais.³⁴ The aberrant price of 1350 no doubt reflects the dislocation of production and the market arising from the plague.

It is important not to press this analysis too far. The trend line is only an artificial 'norm', and the division into periods, although it seems to fit the evidence, is arbitrary.³⁵ It is also important to remember that medieval society was not a perfect market, and that the price data (based on only five large Winchester manors) may not always be fully representative. Unexplained deviations from the norm are common enough to make it clear that even in years where the behaviour of wheat prices does seem explicable, many unseen factors were also no doubt at work. With these reservations in mind, however, the analysis is offered as a means of looking at prices of wheat with the yield factor largely neutralized. The evidence does seem to suggest that demand for money did adjust, albeit rather slowly and imperfectly, to changes in supply by inflating and deflating prices. Greater price elasticity may correspond with periods of increased monetary supply relative to demand.

IV

If one relates the general level of wheat prices in these periods to the estimates of money supply advanced at the beginning of this paper, one may detect some measure of broad correspondence. As Bridbury has noted, the sudden late twelfth-century surge in prices has every appearance of monetary inflation, and will not easily be reconciled with the sort of gradually expanding

demand to be expected from population growth.³⁶ Had Bridbury extended his enquiry beyond the thirteenth century he would perhaps have found the suddenness of the early fourteenth-century price boom pushing him towards a similar conclusion.³⁷ Between these two price leaps, early thirteenth-century prices and money supply both seem to have been significantly above twelfth-century levels and below the levels achieved later from the middle of the century. After the great inflation of the early fourteenth century both prices and money supply receded in the twenty years before the Black Death.³⁸ After the plague, the puzzling buoyancy of prices despite the drastic reduction in population and demand finds its simplest explanation in the increased quantities of coin available per head of population.

It is therefore suggested that both in the long-term trend, and in its short-term effects, especially at times of recoinages, monetary factors may have had an important effect on prices. It may also be suggested that both through its effect on prices, and directly by increased or reduced availability of coin, changes in money supply may be relevant to historians pursuing other questions of social and economic organization. Long ago P D A Harvey attributed the English experiment in high farming to the great inflation of 1180-1220.³⁹ More recently Spufford has written of a thirteenth-century economic revolution across Europe as a whole, fuelled in large part by a booming money supply.⁴⁰ It may be that the historians of markets, or labour services,

³⁴ Mavis Mate, 'The estates of Canterbury Cathedral Priory before the Black Death 1315-1348', *loc cit*. I am grateful to Dr Mate for kindly allowing me a preview of this paper.

³⁵ When 1232 was moved from the second period to the first, the correlation for the first group improved, but that for the second suffered correspondingly. The degree of scatter seems to be such that a division of periods based chiefly on the availability of the data seems as good as any other.

³⁶ See also P D A Harvey, 'The English inflation of 1180-1220', *Past and Present*, 61, 1973, 26-9.

³⁷ See M Mate, 'High prices in early fourteenth century England: causes and consequences', *Econ Hist Rev*, 2nd ser, XXVIII, 1975, 1-16.

³⁸ D L Farmer, 'Crop yields . . .', *Studies in Medieval and Renaissance History*, 6, 1983, 139. Farmer accepts a monetary inflation for both the inflations of 1180-1220 and 1304-1311, and the deflation of the 1330s and 40s.

³⁹ P D A Harvey, *op cit* (note 36 above).

⁴⁰ Peter Spufford, 'Le rôle de la monnaie dans la révolution commerciale du XIII^e siècle', *Études d'Histoire Monétaire*, ed John Day, Lille, 1984, 355-95.

or taxation, or professional armies also need to give greater attention to the question of availability of coin. The matter is not straightforward: did a larger money supply facilitate money rents or through inflation encourage the exaction of labour services? It is by no means clear how the availability of coin will have affected methods of payment, or indeed whether an expanded

money supply did make coin more generally available or merely inflated prices. Yet given that the English population of 1300 could not have conducted its business as it did with the money supply of 1160, it may well be that monetary questions and the numismatic data through which they may be approached would justify further historical research.

Appendix: Price Analysis by Period

A: 1211-1226

$x = \text{yield}$ $y = \text{price}$
 curve type: $y = a + bx$, where $a = 8.89$
 (y intercept)
 and $b = -1.27$ (coefficient of slope)
 Index of determination = 0.11
 Correlation coefficient = 0.34

Year	Yield x	Price y (actual)	Price y (calculated)	Difference
1211	3.17	2.70	4.88	-2.18
1218	2.97	4.63	5.14	-0.51
1219	3.53	3.44	4.43	-0.99
1220	3.18	5.73	4.87	0.86
1224	3.01	6.53	5.08	1.45
1225	3.86	4.93	4.01	0.92
1226	2.81	5.78	5.34	0.44

Standard error of estimate = 1.28

B: 1232-1277

$x = \text{yield}$ $y = \text{price}$
 curve type: $y = a + bx$, where $a = 13.05$
 (y intercept)
 and $b = -1.90$ (coefficient of slope)
 Index of determination = 0.40
 Correlation coefficient = 0.64

Year	Yield x	Price y (actual)	Price y (calculated)	Difference
1232	4.58	4.10	4.36	-0.26
1236	5.11	4.88	3.36	1.52
1245	4.20	3.83	5.08	-1.25
1246	3.33	6.67	6.73	-0.06
1247	3.49	6.58	6.43	0.15
1248	4.73	3.50	4.08	-0.58
1252	3.97	5.58	5.52	0.06
1253	4.02	3.33	5.42	-2.09
1254	3.77	3.17	5.90	-2.73
1257	3.50	8.17	6.41	1.76
1265	3.97	4.50	5.52	-1.02
1268	3.84	5.50	5.77	-0.27
1271	3.33	8.58	6.73	1.85
1272	4.63	5.58	4.27	1.31
1273	3.42	6.63	6.56	0.07
1274	3.32	7.50	6.75	0.75
1277	4.44	5.42	4.63	0.79

Standard error of estimate = 1.29

C: 1283-1302

x = yield y = price
 curve type: $y = a + bx$, where $a = 9.68$
 (y intercept)
 and $b = -1.03$ (coefficient of slope)
 Index of determination = 0.23
 Correlation coefficient = 0.47

D: 1305-1332

x = yield y = price
 curve type: $y = a + bx$, where $a = 15.79$
 (y intercept)
 and $b = -2.12$ (coefficient of slope)
 Index of determination = 0.54
 Correlation coefficient = 0.73

Year	Yield x	Price y (actual)	Price y (calculated)	Difference
1283	2.79	6.83	6.82	0.01
1284	3.43	4.83	6.16	-1.33
1285	3.32	6.42	6.28	0.14
1286	3.46	4.67	6.13	-1.46
1287	4.65	3.25	4.91	-1.66
1288	4.16	3.92	5.42	-1.50
1289	3.37	6.08	6.23	-0.15
1290	3.06	7.58	6.54	1.04
1291	3.54	6.58	6.05	0.53
1292	3.49	6.67	6.10	0.57
1296	4.40	6.42	5.17	1.25
1297	3.89	7.42	5.69	1.73
1298	4.90	5.75	4.66	1.09
1299	3.85	6.42	5.73	0.69
1300	3.64	5.92	5.95	-0.03
1301	4.20	5.58	5.37	0.21
1302	3.95	4.50	5.63	-1.13

Standard error of estimate = 1.07

Year	Yield x	Price y (actual)	Price y (calculated)	Difference
1305	4.37	6.00	6.54	-0.54
1306	4.08	5.08	7.15	-2.07
1307	3.95	6.42	7.43	-1.01
1308	3.91	8.17	7.51	0.66
1309	4.50	8.33	6.26	2.07
1310	3.23	9.08	8.95	0.13
1311	4.51	6.08	6.24	-0.16
1312	4.30	5.75	6.69	-0.94
1313	4.66	6.25	5.92	0.33
1314	4.14	7.42	7.02	0.40
1317	3.33	9.17	8.74	0.43
1318	5.07	4.75	5.06	-0.31
1320	3.94	6.67	7.45	-0.78
1324	3.62	7.83	8.15	-0.30
1325	4.94	5.67	5.33	0.34
1326	5.15	4.75	4.89	-0.14
1327	4.28	5.75	6.73	-0.98
1328	3.83	7.25	7.68	-0.43
1329	4.18	7.17	6.94	0.23
1330	3.99	8.75	7.34	1.41
1331	4.08	9.17	7.15	2.02
1332	4.45	6.00	6.37	-0.37

Standard error of estimate = 0.98

E: 1335-1350

$x = \text{yield}$ $y = \text{price}$

curve type: $y = a + bx$, where $a = 12.66$
(y intercept)

and $b = -1.78$ (coefficient of slope)

Index of determination = 0.69

Correlation coefficient = 0.83

Year	Yield x	Price y (actual)	Price y (calculated)	Difference
1335	3.85	5.92	5.79	0.13
1336	4.19	4.83	5.19	-0.36
1337	4.88	4.42	3.96	0.47
1338	4.67	4.58	4.33	0.25
1339	2.27	7.17	8.61	-1.44
1340	4.11	4.75	5.33	-0.58
1341	3.26	5.33	6.84	-1.51
1342	4.14	4.83	5.28	-0.45
1343	3.25	7.33	6.86	0.47
1344	4.89	4.42	3.98	0.48
1345	4.04	4.83	5.45	-0.62
1346	3.12	8.08	7.09	0.99
1347	3.36	7.75	6.67	1.08
1348	4.03	4.58	5.47	-0.89
1349	3.25	7.08	6.86	0.22
1350	2.71	9.59	7.83	1.77

Standard error of estimate = 0.90