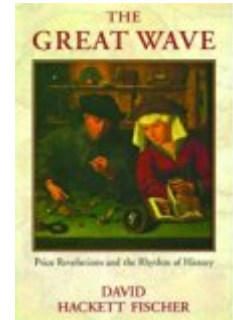


David Hackett Fischer. *The Great Wave: Price Revolutions and the Rhythm of History.* Oxford and New York: Oxford University Press, 1996. xvi + 536 pp. \$70.00, cloth, ISBN 978-0-19-505377-7.



Reviewed by John H. Munro

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Let me begin on a positive note. This is indeed a most impressive work: a vigorous, sweeping, grandiose, and contentious, though highly entertaining, portrayal of European and North American economic history, from the High Middle Ages to the present, viewed through the lens of "long-wave" secular price trends. Indeed its chief value may well lie in the controversies that it is bound to provoke, particularly from economists, to inspire new avenues of research in economic history, especially in price history. The author contends that, over the past eight centuries, the European economy has experienced four major "price-revolutions" whose inflationary forces ultimately became economically and socially destructive, with adverse consequences that provoked various complex reactions whose "resolutions" in turn led to more harmonious, prosperous, and "equitable" economic and social conditions during intervening eras of "price equilibria." These four price-revolutions are rather too neatly set out as the following: 1) the later- medieval, from c.1180-c.1350; 2) the far better known sixteenth-century Price-Revolution, atypically dated from c.1470 to c.1650, 3) the inflation of the Industrial Revolution era,

from c.1730 to 1815; and 4) the twentieth century price-revolution, conveniently dated from 1896 to 1996 (when he published the book).

Though I am probably more sympathetic to the historical concept of "long-waves" than the majority of economists, I do agree with many opponents of this concept that such long-waves are exceptionally difficult to define and explain in any mathematically convincing models, which are certainly not supplied here. For reasons to be explored in the course of this review, I cannot accept his depictions, analysis, and explanations for any of them. This will not surprise Prof. Fischer, who is evidently not an admirer of the economics profession. He is particularly hostile to those of us deemed to be "monetarists," evidently used as a pejorative term. After rejecting not only the "monetarist" but also the "Malthusian, neo-Classical, agrarian, environmental, and historicist" models, for their perceived deficiencies in explaining inflations, and after condemning economists and historians alike for imposing rigid models in attempting to unravel the mysteries of European and North American economic history, Fischer

himself imposes an exceptionally rigid and untenable model for all four of his so-called price-revolutions, containing in fact selected Malthusian and monetarist elements from these supposedly rejected models.

In essence, the Fischer model contends that all of his four long-wave inflations manifested the following six-part consecutive chain of causal and consequential factors, inducing new causes, etc., into the next part of the chain. First, each inflationary long-wave began with a prosperity created from the preceding era of price-equilibrium, one promoting a population growth that inevitably led to an expansion in aggregate demand that in turn outstripped aggregate supply, thus--according to his model--causing virtually ALL prices to rise. Evidently his model presupposes that all sectors of the economy, in all historical periods under examination, came to suffer from Malthusian-Ricardian diminishing returns and rising marginal costs, etc. Second, in each and every such era, after some indefinite lapse of time, and after the general population had become convinced that rising prices constituted a persistent and genuine trend, the "people" demanded and received from their governments an increase in the money supply to "accommodate" the price rises. As Fischer specifically comments, "in every price-revolution, one finds evidence of frantic efforts to expand the money supply, after people have discovered that prices are rising in a secular way" (p. 83). Third, and invariably, in his view, that subsequent and continuous growth in the money supply served only to fuel and thus aggravate the already existing inflation. He never explains, however, for any of the four long-waves, why those increases in money stocks were always in excess of the amount required "to accommodate inflation." Fourth, with such money-stock increases, the now accelerating inflation ultimately produced a steadily worsening impoverishment of the masses, aggravated malnutrition, generally deteriorating biological conditions, and a breakdown of family structures and the social order,

with increasing incidences of crime and social violence: i.e., with a rise in consumer prices that outstripped generally sticky wages in each and every era, and with a general transfer of wealth from the poorer to richer strata of society. Fifth, ultimately all these negative forces produced economic and social crises that finally brought the inflationary forces to a halt, producing a fall in population and thus (by his model) in prices, declines that subsequently led to a new era of "price-equilibrium," along with concomitant re-transfers of wealth and income from the richer to the poorer strata of society (where such wealth presumably belonged). Sixth, after some period of economic prosperity and social harmony, this vicious cycle would recommence, i.e., when these favorable conditions succeeded in promoting a new round of incessant population growth, which inevitably sparked those same inflationary forces to produce yet another era of price-revolution, continuing until it too had run its course.

While many economic historians, using more structured Malthusian-Ricardian type models, have also provided a similarly bleak portrayal of demographically-related upswings and downswings of the European economy, most have argued that this bleak cycle was broken with the economic forces of the modern Industrial Revolution era. Fischer evidently does not. Are we therefore condemned, according to his view, to suffer these never-ending bleak cycles--economic history according to the Myth of Sisyphus, as it were? Perhaps not, if government leaders were to listen to the various nostrums set forth in the final chapter, political recommendations on which I do not feel qualified to comment.

Having engaged in considerable research over the past thirty-five years on European monetary, price, and wage histories from the thirteenth to nineteenth centuries, I am, however, rather more qualified to comment on Fischer's four supposed long-waves. Out of respect for the author's prodigious labors in producing this magnum

opus, one that is bound to have a major impact on the historical profession, especially in covering such a vast temporal and spatial range, I feel duty-bound to provide detailed criticisms of his analyses of these secular price trends, with as much statistical evidence as I can readily muster. Problematic in each is defining their time span, i.e., the onset and termination of inflations. If many medievalists may concur that his first long-wave did begin in the 1180s, few would now agree that it ended as late as the Black Death of 1348-50. On the contrary, the preceding quarter-century (1324-49) was one of very severe deflation, certainly in both Tuscany (Herlihy 1966) and England. In the latter, the Phelps Brown and Hopkins "basket of consumables" price index (1451-75 = 100) fell 47 percent: from 165 in 1323 (having been as high as 216 in 1316, with the Great Famine) to just 88 in 1346. Conversely, while most early-modern historians would agree that the sixteenth-century Price Revolution generally ended in the 1650s (certainly in England), few if any would date its commencement so early as the 1470s. To be sure, in both the Low Countries and England, a combination of coinage debasements, civil wars, bad harvests, and other supply-shocks did produce a short-term rise in prices from the later 1470s to the early 1490s; but thereafter their basket-of-consumables price-indices resumed their deflationary downward trend for another three decades (Munro 1981, 1983). In both of these regions and in Spain as well (Hamilton 1934), the sustained rise in the general price level, lasting over a century, did not commence until c. 1520. For Fischer's third inflationary long-wave, of the Industrial Revolution era, his periodization is much less contentious, though one might mark its commencement in the late 1740s rather than the early 1730s.

The last and most recent wave is, however, by far more the most controversial in its character. Certainly a long upswing in world prices did begin in 1896, and lasted until the 1920s; but can we really pretend that this so neatly defined century

of 1896 to 1996 truly encompasses any form of long-wave when we consider the behavior of prices from the 1920s? Are we to pretend that the horrendous deflation of the ensuing Great Depression era was just a temporary if unusual aberration that deviated from this particular century long (saeculum) secular trend? Fischer, in fact, very rarely ever discusses deflation, ignoring those of the fourteenth century and most of the rest. Instead, he views the three periods intervening between his price-revolutions as much more harmonious eras of price-equilibria: i.e. 1350-1470; 1650-1730; 1820-1896; and he suggests that we are now entering a fourth such era. In my own investigations of price and monetary history from the twelfth century, prices rise and fall, with varying degrees of amplitude; but they rarely if ever remain stable, "in equilibrium."

Certainly "equilibrium" is not a word that I would apply to the first of these eras, from 1350 to 1470: not with the previously noted, very stark deflation of c.1325-48, followed by an equally drastic inflation that ensued from the Black Death over the next three decades, well documented for England, Flanders (Munro 1983, 1984), France, Tuscany (Herlihy 1966), and Aragon-Navarre (Hamilton 1936). Thus, in England, the mean quinquennial PB&H index rose 64 percent: from 88 in 1340-44 to 145 in 1370-74, falling sharply thereafter, by 29 percent, to 103 in 1405-09; after subsequent oscillations, it fell even further to a final nadir of 87 in 1475-79 (when, according to Fischer, the next price-revolution was now under way). For Flanders, a similarly constructed price index of quinquennial means (1450-74 = 100: Munro 1984), commencing only in 1350, thereafter rose 170 percent: from 59 in 1350-4 to 126 in 1380-84, reflecting an inflation aggravated by coinage debasements that England had not experienced, indeed none at all since 1351. Thereafter, the Flemish price index plunged 32 percent, reaching a temporary nadir of 88 in 1400-04; but after a series of often severe price oscillations, aggravated by warfare and more coin debasements, it rose to

a peak of 138 in 1435-9; subsequently it fell another 31 percent, reaching its fifteenth century nadir of 95 in 1465-9 (before rising and then falling again, as noted earlier).

Implicit in these observations is the quite pertinent criticism that Fischer has failed to use, or use properly, these and many other price indices--especially the well-constructed Van der Wee index (1975), for the Antwerp region, from 1400 to 1700, so important in his study, and the Rousseaux and Gayer-Rostow-Schwarz indices for the nineteenth century (Mitchell & Deane 1962). On the other hand, he has relied far too much on the dangerously faulty d'Avenel price index (1894-1926) for medieval and early-modern France. Space limitations, and presumably the reader's patience, prevent me from engaging in similar analyses of price trends over the ensuing centuries, to indicate further disagreements with Fischer's analyses, except to note one more quarter-century of deflation during a supposed era of price equilibrium: that of the so-called Great Depression era of 1873 to 1896, at least within England, when the PB&H price index fell from 1437 to 947, a decline of 34 percent that was unmatched, for quarter-century periods in English economic history, since the two stark deflations of the second and fourth quarters of the fourteenth century. (The Rousseaux index fell from 42.5 percent from 127 in 1873 to 73 in 1893).

My criticisms of Fischer's temporal depictions of both inflationary long-waves and intervening eras of supposed price equilibria are central to my objections to his anti-monetarist explanations for them, or rather to his misrepresentation of the monetarist case, a viewpoint he admittedly shares with a great number of other historians, especially those who have found Malthusian-Ricardian type models to be more seductively plausible explanations of inflation. Certainly, too many of my students, in reading the economic history literature on Europe before the Industrial Revolution era, share that beguiling view, turning a deaf ear

to the following arguments: namely, that 1) a growth in population cannot by itself, without complementary monetary factors, cause a rise in all prices, though certainly it often did lead to a rise in the relative prices of grain, timber, and other natural-resource based commodities subject to diminishing return and supply inelasticities; and thus 2) that these simplistic demographic models involve a fatal confusion between a change in the relative prices of individual commodities and a rise in the overall price-level. Some clever students have challenged that admonition, however, with graphs that seek to demonstrate, with intersecting sets of aggregate demand and supply curves, that a rise in population is sufficient to explain inflation. My response is the following. First, all of the historical prices with which Fischer and my students are dealing (1180-1750) are in terms of silver-based moneys-of-account, in the traditional pounds, shillings, and pence, tied to the region's currently circulating silver penny, or similar such coin, while prices expressed in terms of the gold-based Florentine florin behaved quite differently over the long periods of time covered in this study. Indeed we should expect such a difference in price behavior with a change in the bimetallic ratio from about 10:1 in 1400 to about 16:1 in 1650, which obviously reflects the fall in the relative value or purchasing power of silver--an issue virtually ignored in Fischer's book. Second, the shift, in this student graph, from the conjunction of the Aggregate Demand and Supply schedules, from P1.Q1 and P2.Q2, requires a compensatory monetary expansion in order to achieve the transaction values indicated for the two price levels: from 17,220,000 pounds and 122,960,000 pounds, which increase in the volume of payments had to come from either increased money stocks and/or flows. Even if changes in demographic and other real variables, shared responsibility for inflation by inducing changes in those monetary variables, we are not permitted to ignore those variables in explaining historical inflations.

Admittedly, from the twelfth to the eighteenth centuries, to the modern Industrial Revolution era, correlations between demographic and price movements are often apparent. But why do so few historians consider the alternative proposition that much more profound, deeper economic forces might have induced a complex combination of general economic growth, monetary expansion, and a rise in population, together (so that such apparent statistical relationships would have adverse Durbin-Watson statistics to indicate significant serial correlation)? Furthermore, if population growth is the inevitable root cause of inflation, and population decline the purported cause of deflation, how do such models explain why the drastic depopulations of the fourteenth-century Black Death were followed by three decades of severe inflation in most of western Europe? Conversely, why did late nineteenth-century England experience the above-noted deflation while its population grew from 23.41 million in 1873 (PB&H at 1437) to 30.80 million in 1896 (PB&H at 947)?

Nor is Fischer correct in asserting that, in each and every one of his four price-revolutions, an increase in money supplies followed rather than preceded or accompanied the rises in the price-level. For an individual country or region, however, one might argue that a rise in its own price level, as a consequence of a transmitted rise in world or at least continental prices would have quickly--and not after the long-time lags projected in Fischer's analysis--produced an increase in money supplies to satisfy the economic requirements for that rise in national/regional prices. Fischer, however, fails to offer any theoretical analysis of this phenomenon, and makes no reference to any of the well-known publications on the Monetary Approach to the Balance of Payments (by Frenkel and Johnson [1976], McCloskey and Zecher [1976], Dick and Floyd [1985, 1992]; Flynn [1978] and D. Fisher [1989], for the Price Revolution era itself). In essence, and with some necessary repetition, this thesis contends: 1) that a rise

in world price levels, initially arising from increases in world monetary stocks, is transmitted to most countries through the mechanisms of international commerce (in commodities, services, labor) and finance (capital flows); and 2) that monetized metallic (coin) stocks and other elements constituting M1 will be endogenously distributed among all countries and/or regions in order to accommodate the consequent rise in the domestic price levels, 3) without involving those international bullion flows that the famous Hume "price-specie flow" mechanism postulates to be the consequences of inflation-induced changes in national trade balances.

In any event, the historical evidence clearly demonstrates that, for each of Fischer's European-based price-revolutions, an increase in European monetary stocks and flows always preceded the inflations. For the first, the price-revolution of the so-called "long-thirteenth century" (c.1180-c.1325), Ian Blanchard (1996) has recently demonstrated that within England itself, specifically in Cumberland-Northumberland, a very major silver mining boom had commenced much earlier, c.1135-7, peaking in the 1170s, with annual silver outputs that were "ten times more than had been produced in the whole of Europe" for any year in the past seven centuries. By the 1170s, and thus still before evident signs of general inflation or a marked demographic upswing, an even greater silver mining boom had begun in the Harz Mountains region of Saxony, which continued to pour out vast quantities of silver until the early fourteenth century. For this same "Commercial Revolution" era, we must also consider the accompanying financial revolution, also evident by the 1180s, in Genoa and Lombardy; and though one may debate the impact that their deposit-and-transfer banking and foreign-exchange banking had upon aggregate European money supplies, these institutional innovations undoubtedly did at least increase the volume of monetary flows, and near

the beginning, not the middle, of this first documented long-wave.

For the far better known sixteenth-century Price Revolution, Fischer seems to pose a much greater threat to traditional monetary explanations, especially in so quixotically dating its commencement in the 1470s, rather than in the 1520s. Certainly Fischer and many other critics are on solid grounds in challenging what had been, from the time of Jean Bodin (1566-78) to Earl Hamilton (1928-35), the traditional monetary explanation for the origins of the Price Revolution: namely, the influx of Spanish American treasure. But not until after European inflation was well underway, not until the mid-1530s, were any significant amounts of gold or silver being imported (via Seville); and no truly large imports of silver are recorded before the early 1560s (a mean of 83,374 kg in 1561-55: TePaske 1983), when the mercury amalgamation process was just beginning to effect a revolution in Spanish-American mining.

Those undisputed facts, however, in no way undermine the so-called "monetarist" case; for Fischer, and far too many other economic historians, have ignored the multitude of other monetary forces in play since the 1460s. The first and least important factor was the Portuguese export of gold from West Africa (Sao Jorge) beginning as a trickle in the 1460s; rising to 170 kg per annum by 1480, and peaking at 680 kg p.a. in the late 1490s (Wilks 1993). Far more important was the Central European silver mining boom, which began in the 1460s, at the very nadir of the West European deflation, which had thus raised the purchasing power of silver and so increased the profit incentive to seek out new silver sources: as a technological revolution in both mechanical and chemical engineering. According to John Nef (1941, 1952), when this German-based mining boom reached its peak in the mid-1530s, it had augmented Europe's silver outputs more than five-fold, with an annual production that ranged from a minimum of 84,200 kg fine silver to a maximum

of 91,200 kg--and thus well in excess of any amounts pouring into Seville before the mid-1560s. My own statistical compilations, limited to just the major mines, indicate a rise in quinquennial mean fine-silver outputs from 12,356 kg in 1470-74 to 55,025 kg in 1534-39 (Munro 1991). In England, twenty-five-year mean mint outputs rose from 18,932 kg silver in 1400-24 to 33,655 kg in 1475-99 to 59,090 kg in 1500-24; and then to 305,288 kg in 1550-74 (i.e., after Henry VIII's "Great Debasement"); in the southern Low Countries, those means go from 54,444 kg in 1450-74 to 280,958 kg in 1550-74 (Challis 1992; Munro 1983, 1991).

In my view, however, equally important and probably even more important was the financial revolution that had begun in or by the 1520s with legal sanctions for and then legislation on full negotiability, and the contemporary establishment of effective secondary markets (especially the Antwerp Bourse) in fully negotiable bills and rentes, i.e., heritable government annuities; and the latter owed their universal and growing popularity, compared with other forms of public debt, to papal bulls (1425, 1455) that had exonerated them from any taint of usury. To give just one example of a veritable explosion in this form of public credit (which thus reduced the relative demand for gold and silver coins), an issue that Fischer almost completely ignores: the annual volume of transactions in Spanish heritable juros rose from 5 million ducats (of 375 maravedis) in 1515 to 83 million ducats in the 1590s (Van der Wee 1977). Thus we need not call upon Spanish-American bullion imports to explain the monetary origins of the European Price Revolution, though their importance in aggravating and accelerating the extent of inflation from the 1550s need hardly be questioned, especially, as Frank Spooner (1972) has so aptly demonstrated, even anticipated arrivals of Spanish treasure fleets would induce German and Genoese bankers to expand credit issues by some multiples of the perceived bullion values. Fischer, by the way, comments that

"the largest proportionate increases in Spanish prices occurred during the first half of the sixteenth century--not the second half, when American treasure had its greatest impact" (p. 82). This is simply untrue: from 1500-49, the Spanish composite price index rose 78.5 percent; from 1550-99, it rose by another 92.1 percent (Hamilton 1934).

Changes in money stocks or other monetary variables do not, however, provide the complete explanation for the actual extent of inflation in this or in any other era. Even if every inflationary price trend that I have investigated, from the twelfth to twentieth centuries, has been preceded or accompanied by some form of monetary expansion, in none was the degree of inflation directly proportional to the observed rate of monetary expansion, with the possible exception of the post World War I hyperinflations. Consider this proposition in terms of the oft-maligned, conceptually limited, but still heuristically useful monetary equation $MV = Py$ [in which real $y = Y/P = C + I + G + (X-M)$]; or, better, in terms of the Cambridge "real cash balances" approach: $M = kPy$, in which k = the proportion of real NNI (Py) that the public chooses to hold in real cash balances, reflecting the constituent elements of Keynesian liquidity preference. Some Keynesian economists would contend that an increase in M , or in the rate of growth of money stocks, would be accompanied by some offsetting rise in y (i.e. real NNI), whether exogenously created or endogenously induced by related forces of monetary expansion, and also by some decline in the income velocity of money, with a reduced need to economize on the use of money. Since mathematically $V = 1/k$, they would similarly posit that an expansion in M , or its rate of growth, would have led, *ceteris paribus*--without any change in liquidity preference, to a fall in (nominal) interest rates, and thus, by the consequent reduction in the opportunity costs of holding cash balances, to the necessarily corresponding rise in k (i.e., an increase in the demand for real cash balances; see Keynes 1936, pp. 306-7). Sometimes, but only very rarely, have changes in

these two latter variables y and V ($1/k$) fully offset an increase in M ; and thus such increases in money stocks have also resulted, in most historical instances, in some non-proportional degree of inflation: a rising P , as measured by some suitable price index, such as the Phelps Brown and Hopkins basket-of-consumables. (Other economists, it must be noted, would contend that, in any event, the traditional Keynesian model is really not applicable to such long-term phenomena as Fischer's price-revolutions. Keynes himself, in considering "how changes in the quantity of money affect prices... in the long run," said, in the *General Theory*: "This is a question for historical generalisation rather than for pure theory" [1936, p. 306].)

For the sixteenth-century Price Revolution, therefore, the interesting question now becomes, not why did it occur so early (i.e., before significant influxes of Spanish American bullion), but rather why so late--so many decades after the onset of the Central European silver-copper mining boom? Since that boom had commenced in the 1460s, precisely when late-medieval Europe's population was at its nadir, perhaps 50 percent below the 1300 peak, and just after the Hundred Years' War had ended, and just after the complex network of overland continental trade routes between Italy and NW Europe had been successfully restored, one might contend that in such an economy with so much "slack" in under-utilized resources, especially land, and with elastic supplies for so many commodities, both the monetary expansion and economic recovery of the later fifteenth century, preceding any dramatic demographic recovery, permitted an increase in y proportional to the growth of M , without the onset of diminishing returns and without significant inflation, before the 1520s. By that decade, however, the monetary expansion had become all the more powerful: with the peak of the Central European silver-mining boom and with the rapid increase in the use of negotiable, transferable credit instruments and, furthermore, with the Ottoman conquest of the Mamluk Sultanate (1517), which evi-

dently diverted some considerable amounts of Venetian silver exports from the Levant to the Antwerp market.

The role of the income-velocity of money is far more problematic. According to Keynesian expectations, velocity should have fallen with such increases in money stocks. Yet three eminent economic historians--Harry Miskimin (1975), Jack Goldstone (1984), and Peter Lindert (1985)--have sought to explain England's sixteenth-century Price Revolution by a very contrary thesis: of increased money flows (or reductions in k) that were induced by demographic and structural economic changes, involving inter alia (according to their various models) disproportionate changes in urbanization, greater commercialization of the rural sectors, far more complex commercial and financial networks, changes in dependency ratios, etc. The specific circumstances so portrayed, however, apart from the demographic, are largely peculiar to sixteenth-century England and thus do not so convincingly explain the very similar patterns of inflation in the sixteenth-century Low Countries, which had undergone most of these structural economic changes far earlier. Certainly these velocity models cannot logically be applied to Fischer's three other inflationary long-waves. Indeed, in an article implicitly validating Keynesian views, Nicholas Mayhew (1995) has contended that the income-velocity of money has always fallen with an expansion in money stocks, from the medieval to modern eras, with this one anomalous exception of the sixteenth-century Price Revolution. Perhaps, for this one era, we have misspecified V (or k) by misspecifying M : i.e., by not properly including increased issues of negotiable credit; or perhaps institutional changes in credit (as Goldstone and Miskimin both suggest) did have as dramatic an effect on V as on M . Furthermore, an equally radical change in the coined money supply (certainly in England), from one that had been principally gold to one which, precisely from the 1520s, became largely and then almost entirely silver, may pro-

vide the solution to the velocity paradox in that the transactions velocity attached to small value silver coins, of 1d., is obviously far higher velocity than that for gold coins valued at 80d and 120d. Except for a brief reference to Mayhew's article in the lengthy bibliography, Fischer virtually ignores such velocity issues (and thus changes in the demand for real cash balances) throughout his eight-century survey of secular price trends.

Finally, Fischer's thesis that population growth was responsible for this the most famous Price Revolution (and all other inflationary long waves) is hardly credible, especially if he insists on dating its inception the 1470s. For most economic historians (Van der Wee 1963; Blanchard 1970; Hatcher 1977, 1986; Campbell 1981; Harvey 1993) contend that, in Northwest Europe, late-medieval demographic decline continued into the early sixteenth-century; and that England's population in 1520 was no more than 2.25 million, compared to estimates ranging from a minimum of 4.0 to a maximum of 6.0 or even 7.0 million around 1300, the upper bounds being favored by most historians. How--even if the demographic model were to be theoretically acceptable--could a modest population growth from such a very low level in the 1520s, reaching perhaps 2.83 million in 1541, and peaking at 5.39 million in 1656, have been the fundamental cause of persistent, European wide-inflation, already underway in the 1520s?

According to Fischer, the ensuing, intervening price-equilibrium (c.1650-c.1730) involved no discernible monetary contraction, and similarly, his next inflationary long-wave (c.1730-1815) began well before any monetary expansion became--in his view--manifestly evident. The monetary and price data, suggest otherwise, however, incomplete though they may be. Thus, the data compiled by Bakewell, Cross, TePaske, and many others on silver mining at Potosi (Peru) and Zacatecas (Mexico) indicate that their combined outputs fell from a mean of 178,692 kg in 1636-40 to one of 101,534

kg in 1661-5, rising to a mean of 156,497 kg in 1681-5, partially corresponding to guesstimates of European bullion imports, which Morineau (1985) extracted from Dutch gazettes; but then sharply falling once more, and even further, to a more meager mean of 95,842 kg in 1696-1700. During this same era, the Viceroyalty of Peru's domestically-retained share of silver-based public revenues rose from 54 percent to 96 percent (TePaske 1981); the combined silver exports of the Dutch and English East India Companies to Asia (Chaudhuri 1968; Gaastra 1983) increased from a decennial mean of 17,293 kg in 1660-69 to 73,687 kg in 1700-09, while English mint outputs in terms of fine silver (Challis 1992) fell from a mean of 19,400 kg in 1660-64 (but 23,781 kg in 1675-79) to one of just 430.4 kg in 1690-94, i.e., preceding the Great Recoinage of 1696-98. From the early eighteenth century, however, European silver exports to Asia were well more than offset by a dramatic rise in Spanish-American, and especially Mexican silver production: for the latter (with evidence from new or previously unrecorded mines: assembled by Bakewell 1975, 1984; Garner 1980, 1987; Coatsworth 1986, and others), aggregate production more than doubled from a mean of 129,878 kg in 1700-04 to one of 305,861 kg in 1745-49. Possibly even more important, especially with England's currency shift from a silver to a gold standard, was a veritable explosion in aggregate Latin-American gold production: from a decennial mean of just 863.90 kg in 1691-1700 zooming to 16,917.4 kg in 1741-50 (TePaske 1998). Within Europe itself, as Blanchard (1989) has demonstrated, Russian silver mining outputs, ultimately responsible for perhaps 7 percent of Europe's total stocks, rose from virtually nothing in the late 1720s to peak at 33,000 kg per annum in the late 1770s, falling to 18,000 kg in the early 1790s then rising to 21,000 kg per year in the later 1790s.

Finally, even though changes in annual mint outputs are not valid indicators of changes in coined money supplies, let alone of changes in M1, the fifty-year means of aggregate values of

English mint outputs (silver and gold: Challis 1992) do provide interesting signals of longer-term monetary changes: a fall from an annual mean of 348,829 pounds in 1596-1645 to one of 275,403 pounds in 1646-95, followed by a rise, with more than a full recovery, to an annual mean of 369,644 pounds in 1700-49 (thus excluding the Great Recoinage of 1696-98). Meanwhile, if the earlier Price Revolution had indeed peaked in 1645-49, with the quinquennial mean PB&H index at 680, falling to a nadir of 579 in 1690-94, the fluctuations in the first half of the eighteenth-century do not demonstrate any clear inflationary trend, with the mean PB&H index (briefly peaking at 635 in 1725-9) stalled at virtually the same former level, 581, in 1745-49. Thereafter, of course, for the second half of the eighteenth century, the trend is very strongly and incessantly upward, with almost a doubling in PB&H index, to 1093 in 1795-9.

Whatever one may wish to deduce from all these diverse data sets, we are certainly not permitted to conclude, as does Fischer, that inflation preceded monetary expansion, and did so consistently. Such a view becomes all the more untenable when the radical changes in English and banking and credit institutions, following the establishment of the Bank of England in 1694-97, are taken into account: the consequent introduction and rapid expansion in legal-tender paper bank note issues (with prior informal issues by London's Goldsmith banks), and more especially fully negotiable, transferable, and discountable Exchequer bills, government annuities, inland bills and promissory notes, whose veritable explosion in circulation from the 1760s, with the proliferation of English country-banks, hardly requires any further elaboration, even if these issues are given short shrift in Fischer's book. In view of such complex changes in Britain's financial and monetary structures, subsequent data on coinage outputs have even more limited utility in estimating money stocks. But we may note that aggregate mined outputs of Mexican silver more than dou-

bled, from a quinquennial mean of 305,861 kg in 1745-49 to 619,495 kg in 1795-99, while those of Peru more than tripled, from 34,318 kg in 1735-39 (no data for the 1740s) to 126,354 kg in 1795-99 (Garner 1980, 1987; Bakewell 1975, 1984; J. Fisher, 1975).

Having earlier considered the so-called and misconstrued "price-equilibrium" of 1820-1896, let us now finally examine the inception of the fourth and final long-wave commencing in 1896. Fischer again contends that population growth was the "prime mover," despite the fact that Britain's own intrinsic growth rate had been falling from its 1821 peak (from 1.75 to 1.31 in 1865, the last year given in Wrigley-Davies-Oppen-Schofield [1997]). For evidence, he cites an assertion in Colin McEvedy and Richard Jones, *Atlas of World Population History* (1978) to the effect that world population, having increased by 35 percent from 1850 to 1900, increased a further 53 percent by 1950. Are we therefore to believe that such growth was itself responsible for a 45.2 percent rise in, for this era, the better structured Rousseaux price-index [base 100 = (1865cp + 1885cp)/2]: from 73 in 1896 to 106 (while the PB&H index rose from 947 in 1896 to 1021 in 1913)?

As for the role of monetary factors in the commencement of this fourth long wave, Fischer observes (p. 184) that "the rate of growth in gold production throughout the world was roughly the same before and after 1896." This undocumented assertion, about an international economy whose commerce and finance was now based upon the gold standard, is not quite accurate. According to assiduously calculated estimates in Eichengreen and McLean (1994), decennial mean world gold outputs, having fallen from 185,900 kg in 1850-9 to 135,000 kg in 1880-9 (largely accompanying the aforementioned 44 percent fall in the Rousseaux composite index from 128 in 1872 to 72 in 1895), thereafter soared to a mean of 255,600 kg in 1890-9—their graph of annualized data shows that the bulk of this increased output occurred after

1896—virtually doubling to an annual mean of 513,900 kg in 1900-14.

World War I, of course, effectively ended the international gold-standard era, since the Gold-Exchange Standard of 1925-6 was rather different from the older system; and the post-war era ushered in a radically new monetary world of fiat paper currencies, whose initial horrendous manifestation came in the hyperinflations of Weimar Germany, Russia, and most Central European countries, in the early 1920s. For this post-war economy, Fischer does admit that monetary factors often had some considerable importance in influencing price trends; but his analyses, even of the post-war radical, paper-fueled hyperinflations, are not likely to satisfy most economists, either for the inter-war or Post World War II eras, up to the present day.

This review, long as it is, cannot possibly do full justice to an eight-century study of this scope and magnitude. So far I have neglected to consider his often fascinating analyses of the social consequences of inflation over these many centuries, except for brief allusions in the introduction, where I indicated his deeply hostile views to persistent inflation for its inevitably insidious consequences: the impoverishment of the masses, growing malnutrition, the spread of killer-diseases, increased crime and violence in general, and a breakdown of the social order, etc. While some of the evidence for the latter seems plausible, I do have some concluding quarrels with his use of real wage indices. Much of our available nominal money-wage evidence comes from institutional sources on daily wages, which, by their very nature, tend to be fixed over long periods of time (as Adam Smith noted in the *Wealth of Nations* [Cannan ed. 1937, p. 74], "sometimes for half a century together"). Therefore, for such wage series, real wages rose and fell with the consumer price index, as measured by, for example, our Phelps Brown and Hopkins basket-of-consumables index. Its chief problem (as opposed to the

better constructed Van der Wee index for Brabant) is that its components, for long periods, constitute fixed percentages of the total composite index, irrespective of changes in relative prices for, say, grains; and they thus do not reflect the consumers' ability to make cost-saving substitutions. Secondly, they are necessarily based on daily wage rates, without any indication of total annual money incomes; thirdly, the great majority of money-wage earners in pre-modern Europe earned not day rates but piece-work wages, for which evidence is extremely scant.

But more important, before the eighteenth century (or even later), a majority of the European population did not live by money wages, and most wage-earners had supplementary forms of income, especially agricultural, that helped insulate them to some degree from sharp rises in food prices. If rising food prices hurt many wage-earners, they also benefited many peasants, especially those with customary tenures and fixed rentals who could thereby capture some of the economic rent accruing on their lands with such price increases. It may be simplistic to note that there are always gainers and losers with both inflation and deflation—but even more simplistic to focus only on the latter in times of inflation, and especially simplistic to focus on a real wage index based on the PB&H index. And if deflation is so beneficial for the masses, why, during the deflationary period in later seventeenth and early eighteenth century England, do we find, along with a rise in this real-wage index, a rise in the death rate from 23.68/1000 in 1626 to 32.14/1000 in 1681, thereafter falling slightly but rising again to an ultimate peak of 37.00/1000 in 1725 (admittedly an era of anomalous disease-related mortalities), when the PB&H real-wage index stood at 60—some 24 percent higher than the RWI of 36 for 1626? One of the many imponderables yet to be considered, though one might ponder that sometimes high real wages reflect labor shortages from dire conditions, rather than general prosperity and

more equitable wealth and income distributions, as Fischer suggests.

Finally, Fischer's argument that inflationary price-revolutions were always especially harmful to the lower classes by leading to rising interest rates is sometimes but not universally true, even if rational creditors should have raised rates to protect themselves from inflation. Thus, for the Antwerp money market in the sixteenth century, the meticulous evidence compiled by Van der Wee (1964, 1977) shows that nominal interest rates fell over this entire period from 20 percent in 1515 to 9 percent in 1549 to 5 percent in 1561; and on the riskier short term loans to the Habsburg government, from a mean of 19.5 percent in 1506-10 to one of 12.3 percent in 1541-45 to 9.63 percent in 1561-55. In the next price-revolution, during the later eighteenth century, nominal interest rates did rise during periods of costly warfare, i.e., with an increasing risk premium; but real interest rates actually fell because of the increasing tempo of inflation (Turner 1984), more so than did real wages for most industrial workers.

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