Chapter 1

The Contours of World Development

World economic performance was very much better in the second millennium of our era than in the first. Between 1000 and 1998 population rose 22–fold and per capita income 13–fold. In the previous millennium, population rose by a sixth and per capita GDP fell slightly.

The second millennium comprised two distinct epochs. From 1000 to 1820 the upward movement in per capita income was a slow crawl — for the world as a whole the rise was about 50 per cent. Growth was largely "extensive" in character. Most of it went to accommodate a fourfold increase in population. Since 1820, world development has been much more dynamic, and more "intensive". Per capita income rose faster than population; by 1998 it was 8.5 times as high as in 1820; population rose 5.6–fold.

There was a wide disparity in the performance of different regions in both epochs. The most dynamic was Group A: Western Europe, Western Offshoots (the United States, Canada, Australia and New Zealand) and Japan. In 1000–1820, their average per capita income grew nearly four times as fast as the average for the rest of the world. The differential continued between 1820 and 1998 when per capita income of the first group rose 19–fold and 5.4–fold for the second.

There are much wider income gaps today than at any other time in the past. Two thousand years ago the average level for Groups A and B was similar. In the year 1000 the average for Group A was lower as a result of the economic collapse after the fall of the Roman Empire. By 1820, Group A had forged ahead to a level about twice that in the rest of the world. In 1998 the gap was almost 7:1. Between the Western Offshoots and Africa (the richest and poorest regions) it is 19 to one.

Economic performance since 1820 within Group B has not been as closely clustered as in Group A. Per capita income has grown faster in Latin America than Eastern Europe and Asia, and nearly twice as fast as in Africa. Nevertheless, from a Western standpoint, performance in all these regions has been disappointing.

There have been big changes in the weight of different regions. In the year 1000, Asia (except Japan) produced more than two thirds of world GDP, Western Europe less than 9 per cent. In 1820 the proportions were 56 and 24 per cent respectively. In 1998, the Asian share was about 30 per cent compared with 46 per cent for Western Europe and Western Offshoots combined.

Table 1–1. **Level and Rate of Growth of Population: World and Major Regions, 0–1998 A.D.**

	0	*1000*	*1820*	*1998*	*0–1000*	*1000–1820*	*1820–1998*
			(million)		*(annual average compound growth rate)*		
Western Europe	24.7	25.4	132.9	388	0.00	0.20	0.60
Western Offshoots	1.2	2.0	11.2	323	0.05	0.21	1.91
Japan	3.0	7.5	31.0	126	0.09	0.17	0.79
Total Group A	28.9	34.9	175.1	838	0.02	0.20	0.88
Latin America	5.6	11.4	21.2	508	0.07	0.08	1.80
Eastern Europe & former USSR	8.7	13.6	91.2	412	0.05	0.23	0.85
Asia (excluding Japan)	171.2	175.4	679.4	3 390	0.00	0.17	0.91
Africa	16.5	33.0	74.2	760	0.07	0.10	1.32
Total Group B	202.0	233.4	866.0	5 069	0.01	0.16	1.00
World	230.8	268.3	1 041.1	5 908	0.02	0.17	0.98

Source: Appendix B.

Table 1–2. **Level and Rate of Growth of GDP Per Capita: World and Major Regions, 0–1998 A.D.**

	0	*1000*	*1820*	*1998*	*0–1000*	*1000–1820*	*1820–1998*
		(1990 international dollars)			*(annual average compound growth rate)*		
Western Europe	450	400	1 232	17 921	–0.01	0.14	1.51
Western Offshoots	400	400	1 201	26 146	0.00	0.13	1.75
Japan	400	425	669	20 413	0.01	0.06	1.93
Average Group A	443	405	1 130	21 470	–0.01	0.13	1.67
Latin America	400	400	665	5 795	0.00	0.06	1.22
Eastern Europe & former USSR	400	400	667	4 354	0.00	0.06	1.06
Asia (excluding Japan)	450	450	575	2 936	0.00	0.03	0.92
Africa	425	416	418	1 368	–0.00	0.00	0.67
Average Group B	444	440	573	3 102	–0.00	0.03	0.95
World	444	435	667	5 709	–0.00	0.05	1.21

Source: Appendix B.

Table 1–3. **Level and Rate of Growth of GDP: World and Major Regions, 0–1998 A.D.**

	0	*1000*	*1820*	*1998*	*0–1000*	*1000–1820*	*1820–1998*
		(billion 1990 international dollars)			*(annual average compound growth rate)*		
Western Europe	11.1	10.2	163.7	6 961	–0.01	0.34	2.13
Western Offshoots	0.5	0.8	13.5	8 456	0.05	0.35	3.68
Japan	1.2	3.2	20.7	2 582	0.10	0.23	2.75
Total Group A	12.8	14.1	198.0	17 998	0.01	0.32	2.57
Latin America	2.2	4.6	14.1	2 942	0.07	0.14	3.05
Eastern Europe & former USSR	3.5	5.4	60.9	1 793	0.05	0.29	1.92
Asia (excluding Japan)	77.0	78.9	390.5	9 953	0.00	0.20	1.84
Africa	7.0	13.7	31.0	1 939	0.07	0.10	1.99
Total Group B	89.7	102.7	496.5	15 727	0.01	0.19	1.96
World	102.5	116.8	694.4	33 726	0.01	0.22	2.21

Source: Appendix B.

I
The Nature and Welfare Implications of Population Change

The acceleration of population growth over the past millennium could have come from increased fertility or reduced mortality. The evidence (Table 1–4) suggests that a slow and irregular decline in mortality was the predominant cause before 1820. Since 1820 the decline in mortality has been much sharper, and has clearly been the predominant influence. In fact fertility has declined substantially since 1820 (see Table 1–5a). Increases in life expectation are an important manifestation of improvement in human welfare. They are not captured by our measure of GDP, but there has been significant congruence, over time and between regions, in the patterns of improvement in per capita income and life expectation.

Table 1–4. **Life Expectation and Infant Mortality, Both Sexes Combined, 33–1875 A.D.**

Country and period	*Years of life expectation at birth*	*Death rate per 1000 population in lst year of life*	*Source & authors*
Roman Egypt, 33–258	24.0	329	Fragments of Roman Censuses I Bagnall and Frier
England, 1301–1425	24.3	218	Very crude estimates derived from fiscal records: Russell
England, 1541–56	33.7	n.a.	Family reconstitution and
England, 1620–26	37.7	171	inverse projection from
England, 1726–51	34.6	195	birth and death records:
England, 1801–26	40.8	144	Wrigley, *et al.*
France, 1740–49	24.8	296	Family reconstitution:
France, 1820–29	38.8	181	Blayo
Sweden, 1751–55	37.8	203[a]	Parish records & census returns: Gille
Japan, 1776–1875	32.2	277	Temple records: Jannetta
Japan, 1800–50	33.7	295	Temple records: Yasuba
Japan, 1751–1869	37.4	216	Population registers: Saito

a) 1751–1800.

Source: Egypt from Bagnall and Frier (1994), pp. 70 and 100. England 1301–1425 from Russell (1948), pp. 186 and 218. England 1541–1826 (excluding Monmouth) from Wrigley *et al.* (1997), p. 614 for life expectation and p. 219 for infant mortality. France from Blayo (1975), p. 141 for life expectation, pp. 138–9 for infant mortality. Sweden from Gille (1949). Japan from Jannetta and Preston (1991), p. 428 and 433–5, Yasuba (1987), p. 291, deducting a year to adjust to Western reckoning. Saito (1997), p. 143 average for both sexes of his high infant mortality estimate. The first two estimates are derived from temple registers (kakocho), the third from population registers (shumon aratame cho). There is a much greater scarcity of information on infant mortality in Japanese sources than in the European records. Children were not covered in the registers. Temple records provide material on deaths by age but not population. There is a further problem that the Japanese system of counting age was different from that in the West and the degree of ambiguity was large for infants. Japanese children were presumed to be 1 year old at birth and two years old on the following New Year's day. A Japanese child could therefore be anywhere between 2 days and 1 year old when it became 2 years old in the Japanese system (see Saito, 1997). Estimates of infant mortality are therefore hypothetical or inferential. Saito used one of the probability models which Coale and Demeny (1983) constructed to fill gaps in information on deaths by age. Saito (1997), p. 136 shows other estimates with much higher life expectation than the three I show. In my view these are not plausible and either show or infer improbably low infant mortality. Kalland and Pederson (1984) pp. 54 and 61 show life expectation averaging 44 years for 1700–1824 in Kanezaki and an infant mortality rate of less than 100. Smith (1977) pp. 57 and 162 shows a life expectation of 43.2 for 1717–1830 in Nakahara, and a range of alternative infant mortality options which Saito averages at 145. Hanley and Yamamura (1977), p. 222 show a life expectation of 45 for Nishikata 1782–96 and 43 for Fujito 1800–35, without showing infant mortality.

In the year 1000, average life expectation at the world level was probably about 24 years — no better than at the beginning of our era. By 1820, it rose to about 26 years (see Table 1–5b). The rise was biggest — from 24 to 36 years — in Group A, and since then has risen to 78 years. The increase was ten times as fast from 1820 as in the previous eight centuries. In Group B countries, our very crude estimate suggests that there was no improvement between 1000 and 1820. By 1998 it had grown dramatically to an average of 64 years.

Table 1–5a. **Birth Rates and Life Expectation, 1820–1998/9**

	Births per 100 population				***Years of life expectation at birth*** *(Average for both sexes)*			
	1820	***1900***	***1950***	***1998***	***1820***	***1900***	***1950***	***1999***
France	3.19	2.19	2.05	1.26	37	47	65	78
Germany	3.99	3.60	1.65	0.96	41	47	67	77
Italy	3.90	3.30	1.94	0.93	30	43	66	78
Netherlands	3.50	3.16	2.27	1.27	32	52	72	78
Spain	4.00	3.39	2.00	0.92	28	35	62	78
Sweden	3.40	2.69	1.64	1.01	39	56	70	79
United Kingdom	4.02[a]	2.93	1.62	1.30	40[a]	50	69	77
West European Average	3.74	3.08	1.83	1.00	36	46	67	78
United States	5.52	3.23	2.40	1.44	39	47	68	77
Japan	2.62[b]	3.24	2.81	0.95	34	44	61	81
Russia	4.13	4.80	2.65	0.88	28[c]	32	65	67
Brazil	5.43[d]	4.60	4.44	2.10	27[e]	36	45	67
Mexico	n.a.	4.69	4.56	2.70	n.a.	33	50	72
Latin America Average	n.a.	n.a.	4.19	2.51	(27)	(35)	51	69
China	n.a.	4.12[f]	3.70	1.60	n.a.	24[f]	41	71
India	n.a.	4.58[g]	4.50[h]	2.80	21[i]	24[g]	32[h]	60
Asian Average[j]	n.a.	n.a.	4.28	2.30	(23)	(24)	40	66
African Average	n.a.	n.a.	4.92	3.90	(23)	(24)	38	52
World	n.a.	n.a.	3.74	2.30	26	31	49	66

a) 1821; b) 1811–29; c) 1880; d) 1818; e) 1872; f) 1929–31; g) 1891–1911; h) 1941–51; i) 1833; j) excluding Japan.

Source: Birth rates 1820 and 1900: European countries mostly from Maddison (1991a) p. 241; 1821 for England from Wrigley *et al.* (1997), p. 614; Brazil 1818, from Marcilio (1984), otherwise Brazil and Mexico from Maddison and Associates (1992); United States 1820 and 1900 from *Historical Statistics of the United States*, (1975), vol.1, p. 49; China 1929–31 from Barclay *et al.* (1976); India entries for 1900 and 1950 from Mari Bhat (1989), p. 96; Japan 1816–20 (in Yokoucho) from Hayami (1973), p. 160, 1900 and 1950 from Japan Statistical Association (1987). 1950 generally from OECD (1979) and national sources. 1998 from OECD, *Labour Force Statistics, Population et Sociétés,* INED, Paris July–August 1999, and UN Population Division (1997).
Life expectancy 1820: France from Blayo (1975); Germany from Knodel (1988), p. 59 (average of his alternative estimates); Italy derived from Caselli (1991), p. 73; Spain derived from Livi Bacci and Reher (1993), p. 68; Sweden from Gille (1949), p. 43; the United Kingdom from Wrigley *et al.* (1997), p. 614; Russia (1874–84) from Ohlin (1955), p. 411; the United States from *Historical Statistics of the United States* (1975), vol. 1, p. 56 (refers to Massachusetts in 1850); Japan 1820 — average of three estimates in Table 1–4; Brazil 1872 and 1900 from Merrick and Graham (1979), pp. 41, 42 and 57; China , 1929–31 from Barclay, Coale, Stoto and Trussell (1976, p. 621); India, 1833 for Delhi from Visaria and Visaria (1983), p. 473, 1891–1911 and 1941–51 from Mari Bhat (1989), pp. 92, using an average of the three alternative measures shown. 1900 from Maddison (1995a), p. 27, except for the United Kingdom, from Wrigley *et al.* 1950 for most OECD countries from OECD (1979), Mexico from Maddison and Associates (1992), China from Lee and Wang (forthcoming). India from Mari Bhat (1989). Japan from Japan Statistical Association (1987). Other countries and regions 1950 from UN Population Division (1997). 1999 from *Population et Sociétés*. Regions 1820–1900 derived by weighting country estimates. World averages derived by weighting regional averages by regional population.

Life expectation in 1999 in the Group A countries was fairly closely clustered. In Group B, there was not much difference between Russia, Latin America and Asia, with an average of 67 years. But in Africa, life expectation was significantly lower at 52 years.

Although the pattern of improvement in life expectation and per capita income has been similar, the present interregional dispersions are much bigger for income. In 1999 the gap in life expectation between the lead country, Japan, with 81 years and Africa with 52 years was distressingly wide. But it was much smaller than the 15:1 spread in per capita income level between Japan and Africa.

Table 1–5b. **Average Life Expectation for Groups A and B, 1000–1999**
(years at birth; average for both sexes)

	1000	*1820*	*1900*	*1950*	*1999*
Group A	24	36	46	66	78
Group B	24	24	26	44	64
World	24	26	31	49	66

Source: 1820–1999 from weighted average of regions shown in Table 1–5a. Figure for 1000 is a rough inference from first two entries in Table 1–4 and other fragmentary clues.

Table 1–5c. **Rate of Growth of Life Expectation in Groups A and B, 1000–1999**
(annual average compound growth rate)

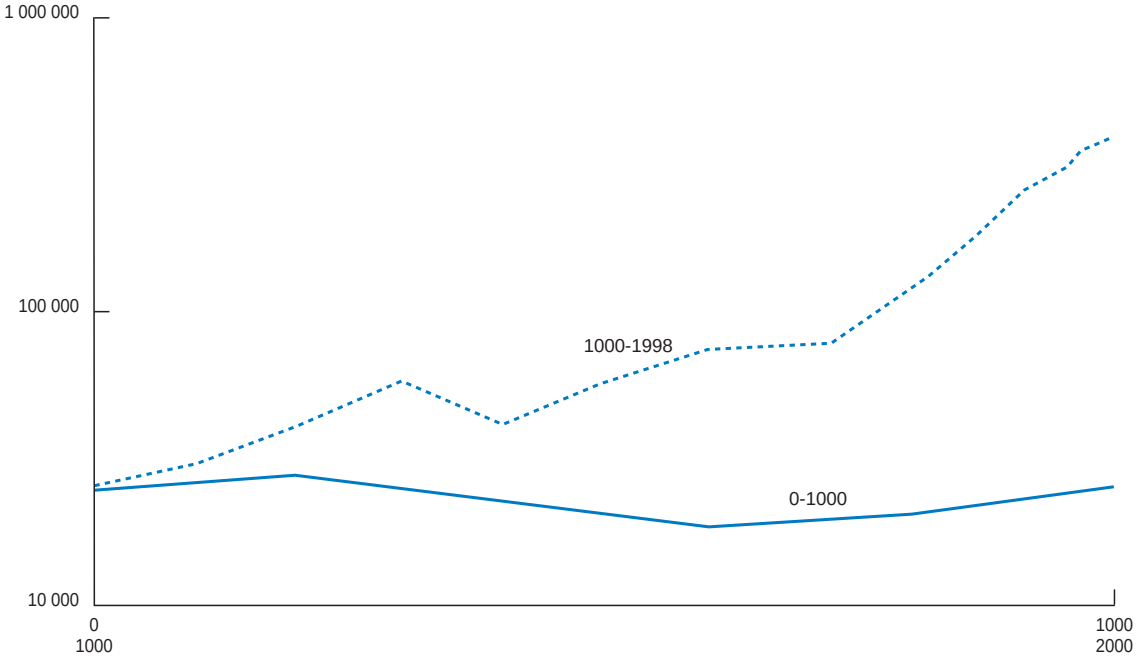
	1000–1820	*1820–1900*	*1900–50*	*1950–99*
Group A	0.05	0.31	0.72	0.34
Group B	0.00	0.10	1.06	0.77
World	0.01	0.22	0.92	0.61

West European Experience

Table 1–6 presents the evidence on long run growth of West European population. The pace of change has been very uneven. There were major disasters in the sixth and fourteenth centuries and a substantial setback in several countries in the seventeenth century. Until the nineteenth century population growth was repeatedly interrupted by crises of varying frequency and severity. These were of three main types: hunger crises due to harvest failure, waves of infectious disease, or war. These different types of causality were of course interactive in varying degree.

As European countries operated much nearer to subsistence levels in the past than is now the case, with poor transport and storage facilities, harvest failures could create big spikes in mortality. They also affected birth rates, because dietary deficiencies caused amenorrhea or led young couples to postpone marriage. A major instance of this type of crisis was the potato famine which doubled the normal death rate in Ireland over the six years 1846–51. "Excess" deaths were nearly one million or about 12 per cent of the 1845 population (see Ó Gráda, 1988).

Figure 1-1. **Population of Western Europe: Confrontation of Two Millennia**
(000)



Source: See Table 1-6a. Vertical scale is logarithmic.

Table 1–6a. **West European Population Levels, 0–1998 A.D.**
(000)

0	***200***	***400***	***600***	***800***	***1000***	***1200***
24 700	27 600	22 900	18 600	20 400	25 413	40 885
1300	***1400***	***1500***	***1600***	***1700***	***1820***	***1998***
58 353	41 500	57 268	73 776	81 460	132 888	388 399

Source: McEvedy and Jones (1978) and Appendix B. The share of five Mediterranean countries (France, Greece, Italy, Portugal, Spain) dropped from 77 per cent in the year 0 to 67 per cent in 1000, 60 per cent in 1500, 52 per cent in 1820, and 45 per cent in 1998.

Table 1–6b. **West European Population Growth Rates, 0–1998 A.D.**
(annual average compound growth rates)

0–200	***200–600***	***600–1000***	***1000–1300***	***1300–1400***
0.06	–0.10	0.08	0.28	–0.34
1400–1500	***1500–1600***	***1600–1700***	***1700–1820***	***1820–1998***
0.32	0.24	0.08	0.41	0.60

Source: As for 1–6a.

Figure 1-5. **Comparative Levels of GDP Per Capita, China and the United Kingdom, 1700-1998**

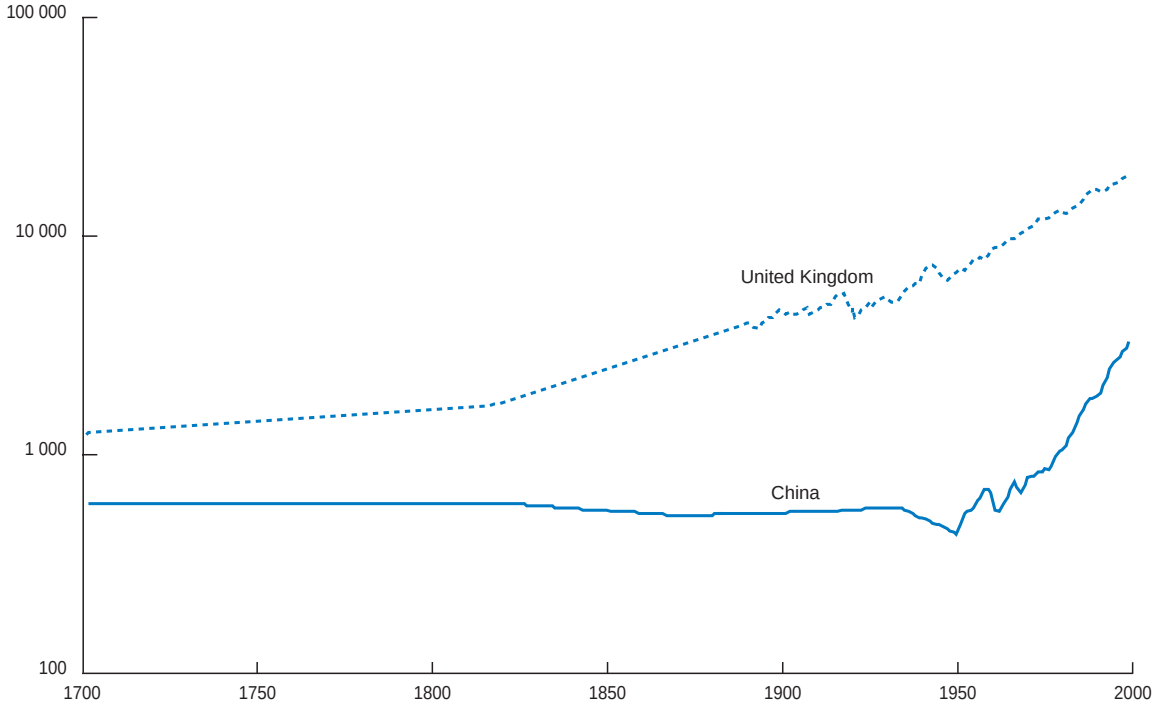
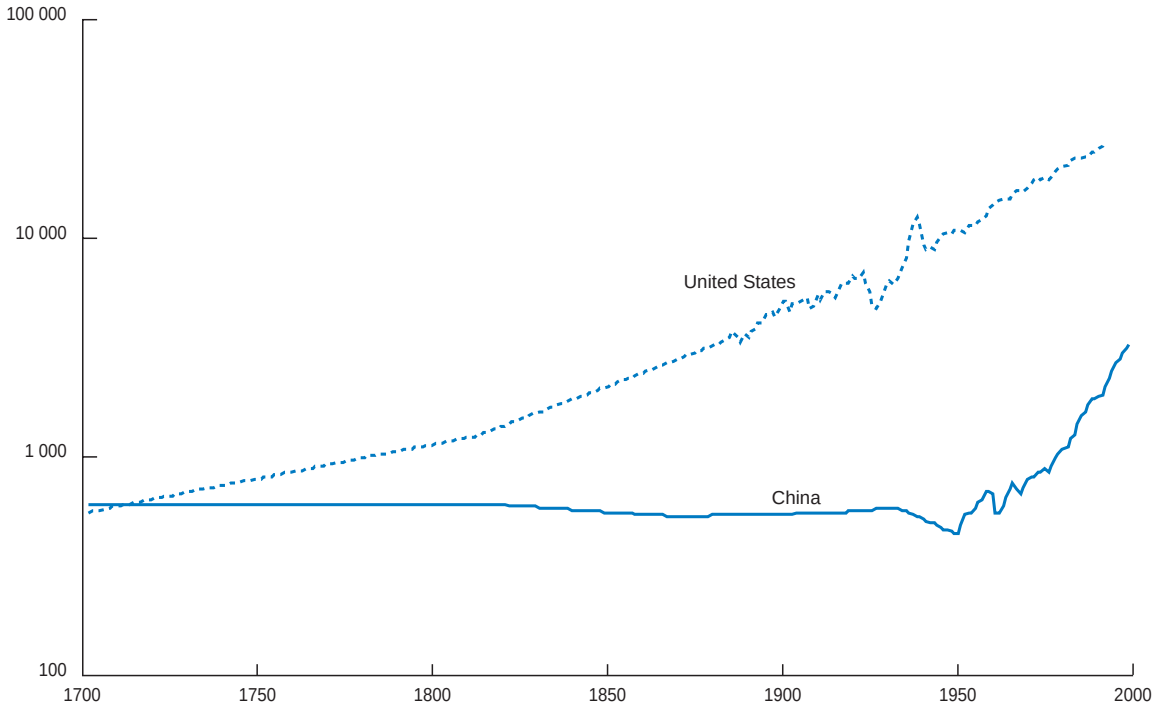


Figure 1.6. **Comparative Levels of GDP Per Capita, China and the United States, 1700-1998**



Source: Appendices A, B, C. Vertical scale is logarithmic.

Recurrent episodes of infectious disease caused major surges in mortality. The worst was bubonic plague which wiped out a third of the European population in the sixth century and again in the fourteenth. The second plague lingered for centuries, finally dying out in England in 1665 and in France in 1720–21. John Graunt, the first scientific demographer, chronicled its impact in London for the years 1592, 1603, 1625, 1630, 1636, and 1665, the worst year, when a total of 97 000 burials were recorded (about 16 per cent of the population). Biraben (1972) estimated a total of 94 000 plague deaths in Provence in 1720–1 (about 32 per cent of the population) due to the arrival of a ship in Marseilles which brought the disease from Syria. The impact of this plague was limited by strict control of movement in and out of the region. The plague disappeared, but many other lethal diseases remained — cholera, diphtheria, dysentery, influenza, measles, smallpox, tuberculosis, typhus and typhoid. Their incidence receded temporarily after epidemics had wiped out the least resistant. In some cases, like the plague, repeated exposure seems to have generated resistance or immunity in the long term. In other cases, the bacterial and viral organisms responsible for infection may have changed. The pattern and duration of acquired immunities varied for reasons not fully understood, but the impact of epidemic disease declined sharply in Western Europe in the late nineteenth and in the twentieth century. However deaths surged again in the global influenza epidemic of 1918–19. The new threat from Aids seems to have been contained in Group A countries.

Until the twentieth century, a major countervailing force in the process of mortality reduction was increased urbanisation. Although city dwellers had higher incomes and better organised food markets than rural areas, their mortality rates were distinctly higher. John Graunt discovered this for London in the seventeenth century where burials were substantially higher than christenings. Mortality rates were a good deal higher in London than in small towns like Romsey, Tiverton and Cranbrook whose experience he also investigated. London's expansion was due to high net immigration, but the big city was a reservoir of infection, with poor sanitation, most lethal in its impact on infants and recent immigrants. Wrigley *et al.* (1997), p. 218, note that in the early eighteenth century London's infant mortality rate was about twice as high as for the country as a whole. Hayami (1986*a*) notes the same phenomenon in Japan, citing evidence for the capital city Edo for 1840–68. In the course of the twentieth century this differential has disappeared (see Preston and van der Walle, 1978, for the decline in the differential in nineteenth century France).

Over the long run, in the centuries before 1820, there was a slow increase in agricultural productivity and improvements in food availability. Hunger crises became less frequent or severe. Increased resistance to disease was also helped by rising living standards, substitution of wine, beer and tea for contaminated water, improvements in clothing and bedding. In the nineteenth and twentieth centuries, better sanitation and public health facilities, improvements in medical knowledge and facilities greatly reduced the incidence of premature death by infectious disease (see Fogel, 1986, for a causal analysis of mortality decline). The most striking feature has been the reduction in infant mortality. Around 1820, it was probably between 150–200 per 1 000 population in Western Europe and about 200 in Japan. In the 1990s, it was about seven in Western Europe and four per 1 000 in Japan. The increase in life expectation for the elderly in Western Europe, the Western Offshoots and Japan since 1950 involved a big rise in health expenditure. Earlier decreases in mortality in the nineteenth and twentieth centuries were much cheaper to obtain.

Figure 1–2 provides a fairly representative picture of European mortality and fertility experience since 1736 when such records first became available in Sweden. Vallin (1991) presents similar charts for English, French, Finnish and Norwegian mortality back to 1720. Until the latter half of the nineteenth century, the pattern in all these countries was more irregular than it has been since because crisis mortality has been greatly mitigated. Figure I–2 also shows the demographic transition which started in the mid–nineteenth century throughout most of Western Europe.

Birth rates have fallen more than death rates. In 1998, they were about a third of their 1820 level. As a consequence population growth is much slower and demographic structure has changed dramatically. In England, which is fairly typical of West European experience, nearly 39 per cent of 1821 population were below 15 years of age and less than 5 per cent were 65 or over. In 1998, 19 per cent were below 15 and nearly 16 per cent 65 or over. The proportion aged 15–64 rose from 60 to 65 per cent.

Table 1–7a. **Population Growth: Western and Iberian Offshoots in Comparative Perspective, 1500–1998**
(annual average compound growth rates)

	1500–1700	*1700–1820*	*1820–1950*	*1950–73*	*1973–98*
United States	–0.35	1.94	2.12	1.45	0.98
Canada	–0.11	1.18	2.20	2.18	1.19
Australia & New Zealand	0.00	– 0.20	2.45	2.16	1.27
Brazil	0.11	1.07	1.92	2.91	2.00
Other Latin America & Caribbean	–0.21	0.36	1.63	2.65	2.02
Western Europe	0.18	0.41	0.64	0.70	0.32
Japan	0.28	0.12	0.77	1.15	0.61
Rest of World	0.17	0.47	0.58	2.09	1.85

Source: Appendices A and B.

Table 1–7b. **Comparative Population Growth in the Americas and Former European Metropoles, 1500–1998**

	Population level (million)		*Coefficient of multiplication*		*Population level (million)*		*Coefficient of multiplication*
	1500	*1998*	*1500–1998*		*1500*	*1998*	*1500–1998*
Brazil	1	170	170	United States	2.00	271	136
Portugal	1	10	10	United Kingdom	3.94	59	15
Other Latin America	16.5	338	20	Canada	0.25	30	120
Spain	6.8	39	6	France	15.00	59	4

Source: Appendices A and B.

Table 1–7c. **Shipment of African Slaves to the Americas, 1500–1870**
(000)

	1500–1600	*1601–1700*	*1701–1810*	*1811–70*	*1500–1870*
Brazil	50	560	1 891	1 145	3 647
Caribbean[a]	–	464	3 234	96	3 793
Spanish America	75	293	579	606	1 552
United States	–	–	348	51	399

a) British, French, Dutch and Danish colonies.
Source: Curtin (1969), p. 268. See also Table 2–5 below.

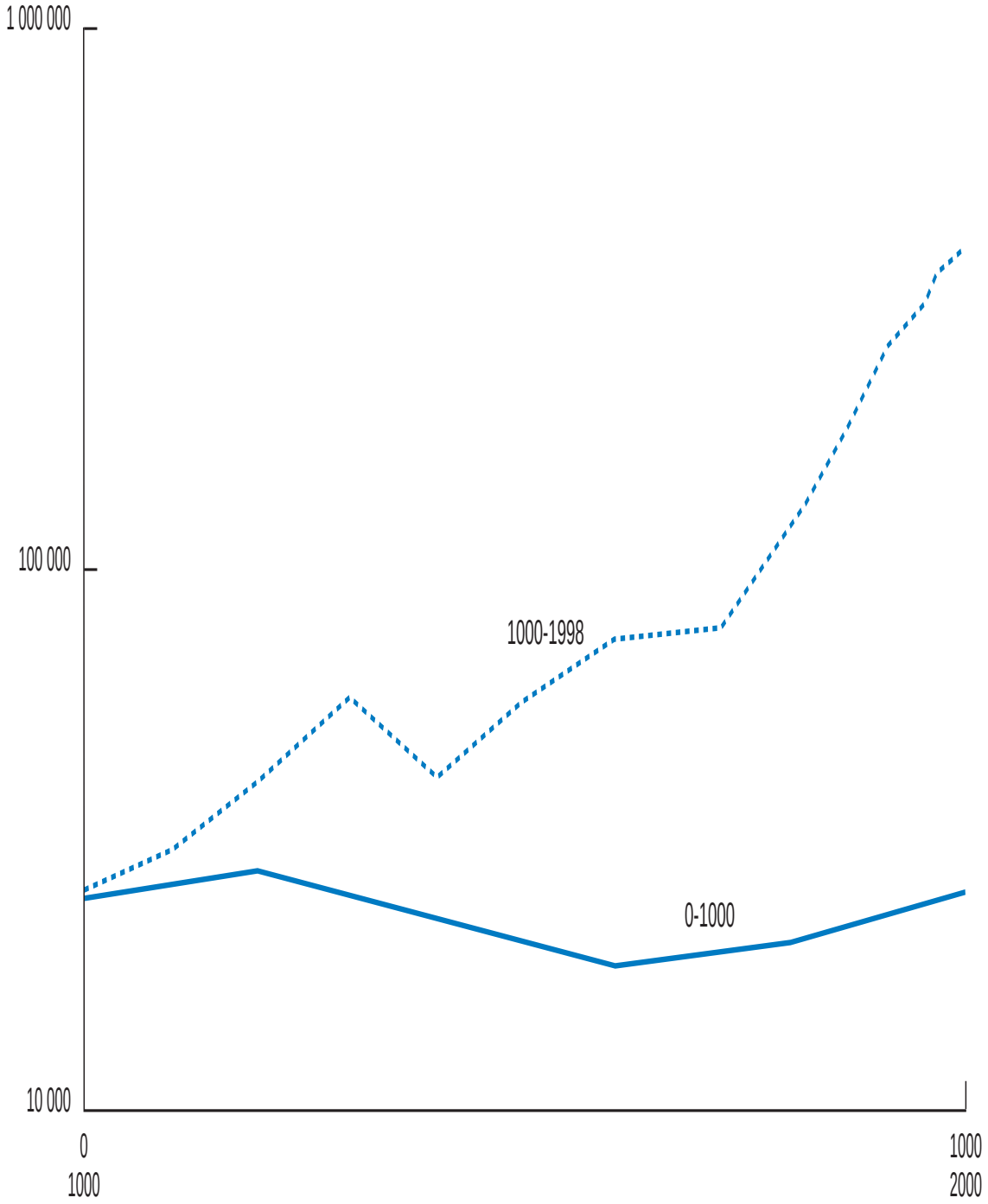
Table 1–7d. **Net Migration to Brazil, Australia and United States and from the United Kingdom, 1500–1998**

	1500–1600	*1600–1700*	*1700–1820*	*1820–69*	*1870–1913*	*1913–50*	*1950–98*
Brazil	+40	+60	+400	+400	+2 200	+1 294	n.a.
Australia	–	–	+33	+1 069	+885	+673	+4 184
United States	–	+131	+587	+6 131	+15 820	+6 221	+24 978
United Kingdom	n.a.	–714	–672	–5 548	–6 415	–1 405	+132

Source: Brazil from Marcilio (1984), Merrick and Graham (1979) and IBGE (1960); Australia 1788–1973 from Vamplew (1987), pp. 4–7; thereafter from OECD, *Labour Force Statistics;* United States 1630–1780 from Galenson (1996), p. 178, and Potter (1965) for 1790–1820. I assumed that 1780–90 immigration was the same as Potter's estimate for 1790–1800; United Kingdom 1600–1820 from Henry and Blanchet (1983) who show net migration from England (their figures exclude deaths at sea and in wars abroad; 1820–69 from Mitchell (1975), pp. 137–40, gross emigration 1820–54 was reduced by one sixth, using the same emigrant/immigrant ratio available for 1855–69. United Kingdom and United States for 1870 onwards from Maddison (1991a), p. 240 and from OECD *Labour Force Statistics*.

Figure 1-1. **Population of Western Europe: Confrontation of Two Millennia**

(000)



Source: See Table 1-6a. Vertical scale is logarithmic.

The Americas and Australasia

The pattern of mortality, migration and population growth in the Americas and Australia was changed drastically by the encounter with Western Europe. The relatively densely populated agrarian civilisations of Mexico and Peru were quickly destroyed by the sixteenth century Spanish conquest mainly because of the inadvertent introduction of European diseases (smallpox, measles, influenza and typhus). Shortly thereafter the traffic in slaves introduced yellow fever and malaria. The consequences were devastating for the indigenous population. At least threequarters of them perished (see Appendix B). In Latin America as a whole, mortality was about twice as big proportionately as Europe's loss from the Black Death.

In parts of the Americas where the population was mainly hunter–gatherers and less densely settled (e.g. Brazil, and the areas that subsequently became Canada and the United States), the impact of disease mortality was somewhat smaller.

Western contact with Australia and other Pacific islands occurred towards the end of the eighteenth century. The impact of disease on mortality was similar to that in the Americas, and there was a more deliberate policy of exterminating the native population than in Spanish America (see Butlin, 1983 and 1993).

Although the initial impact of conquest and colonisation was massively destructive for the indigenous population, the long term economic potential of the Americas was greatly enhanced. Capacity to support a bigger population was augmented by the introduction of new crops and animals (see Crosby, 1972). The new crops were wheat, rice, sugar cane, vines, salad greens, olives, bananas and coffee. The new animals for food were cattle, pigs, chickens, sheep and goats. The introduction of transport and traction animals — horses, oxen, asses and donkeys — along with wheeled vehicles and ploughs (which replaced digging sticks) were another major addition to productive capacity. There was also a reciprocal transfer of New World crops to Europe, Asia and Africa — maize, potatoes, sweet potatoes, manioc, chilis, tomatoes, groundnuts, pineapples, cocoa and tobacco — which enhanced the world's production potential and capacity to sustain population growth.

New economic horizons and acquisition of vast territories led to a large scale transfer of population from Europe and Africa. Between 1500 and 1870 almost nine and a half million African slaves were shipped to work in plantation agriculture (sugar, tobacco, coffee and cotton) in Brazil, the Caribbean and the southern United States.

The migration of Spanish and Portuguese settlers to Latin America in the colonial period (before 1820) was smaller than the movement of slaves. Portuguese emigration was probably about half a million (Marcilio, 1984), and Spanish less than a million (Sanchez–Albornoz, 1984). Galenson (1996) estimates British migration to the Caribbean to have been about a quarter of a million from 1630 to 1780. If we include French and Dutch migration, the net white migration to Latin America probably totalled two million before 1820, compared with imports of 7.5 million slaves. However the life expectation of slaves was a good deal lower. Merrick and Graham (1979, pp. 56–7) estimate 18 years for male slaves in Brazil in 1872, compared with 27 years for the total population. Fertility of slaves was also lower because of the precarious nature of their opportunities for family life. The proportion of females in the white immigrant population was low. Threequarters or more consisted of adult males. Their fertility was quite high because of informal unions with the indigenous and black population. As a result there was a much greater ethnic mix in Latin America than in North America.

Since 1820, Latin American population has grown faster than that of Western Europe. The main reason has been higher birth rates, as the decline in mortality came later and has been smaller. Migration from Europe to Latin America accounted for a substantial part of the differential before 1913, but has been less important since then.

In the area of the United States and Canada, European settlement started in the seventeenth century, and expanded rapidly in the eighteenth, when there was also a large import of slaves. The indigenous population was killed off or pushed out of the areas of European settlement. In 1700,

threequarters of the population had been indigenous, by 1820 they were only 3 per cent (see Table B–15). In the South, there was a heavy concentration on plantation agriculture, with slaves as the main component of the labour force. In the North, white settlers predominated and were mainly occupied on family farms.

White life expectation in North America was similar to that in Western Europe. It was lower for slaves, but the differential was smaller than in Brazil. Merrick and Graham (1979, p. 57) show 35.5 years for slaves in the 1850s and 40.4 for the US population as a whole. Fertility was high. In the United States, the birth rate was 5.5 per 1000 population in 1820, in Canada (Quebec) 5.7. This was much higher than the United Kingdom (4.0) or France (3.2).

Since 1820 the US population has grown a good deal faster than that of Western Europe. The death rate has been similar. The birth rate has remained higher but has declined proportionately as much as in Western Europe. Immigration to the United States has continued at a high level. Most of the immigrants came from Europe before the 1960s, so migration explains a good deal of the US/European growth differential.

Japan

From the seventh to the mid–nineteenth century, Japan tried to model its economy, society and institutions on those of China, but its demographic experience was very different:

a) over the long run, the major check to Japanese population expansion came from famines and hunger crises. Disease and war were much less important than in China (and Europe);

b) by the second half of the eighteenth century, and perhaps earlier, Japanese life expectation was similar to that in Western Europe, and much higher than in China.

Comparative Incidence of Hunger, Disease and War

Macfarlane (1997) provides a comparative survey of the long run forces affecting mortality in England and Japan; Jannetta (1986) a detailed study of Japanese experience with epidemic disease, and Saito (1996) an assessment of the comparative incidence of famine and disease in Japan over the long term.

The major point which emerges from their work is that Japan was not affected by bubonic plague. The main reason was Japan's isolation. Two hundred kilometres of stormy seas separated it from Korea. The nearest point in China was 750 kilometres away. This sea barrier, and official policy, imposed an effective *cordon sanitaire*. Travel into and out of Japan was very restricted. Foreigners trading with Japan were more or less permanently quarantined in a small area near Nagasaki. There was no import of grain or other products likely to introduce pests. The two Mongol attempts to invade Japan in 1274 and 1281 were unsuccessful. If they had succeeded Japan's demographic history (and much else) would have been very different.

Freedom from the plague was the main reason why Japanese population growth was faster than that of Europe and China in the first millennium and a half of our era.

Smallpox was the most significant cause of Japanese epidemics. Mortality from other diseases — cholera, dysentery, malaria, measles, tuberculosis and typhoid fever was milder than in Europe, and epidemic typhus was absent. This situation was mainly due to hygienic habits, and very limited contact with animals. Japanese had an abundant supply of mountain streams and hot springs, and the Shinto emphasis on physical purity led to daily bathing at home or in bathhouses. Japanese houses were austere but kept spotlessly clean and well ventilated. Shoes were left at the entry, there was

virtually no furniture or hangings except mosquito nets. Most water consumption was in the form of tea made with boiling water. The Japanese diet consisted of rice, fish, soyabeans, a considerable variety of vegetables, bamboo shoots and giant radishes. Buddhist tradition meant that Japanese ate virtually no meat. They had no cows, pigs, sheep, goats or animal dung. Although human wastes were used for manure, the few foreigners who visited Japan were greatly impressed by the immaculate privies, and the sanitary treatment of sewage. In 1853, foreigners were able to force an entry into Japan and greatly increased the range of foreign contacts. This resulted very quickly in a major cholera epidemic in 1858–60, and much greater exposure to influenza, tuberculosis, typhoid, typhus and diphtheria (see Saito, 1996 and Honda, 1997). As a consequence the Japanese death rate rose significantly until the 1890s (see Ishii, 1937, pp. 124–5).

Saito (1996) has collated the historical records of famine and crop failure from the eighth to the twentieth century for Japan. Although it is not possible to measure the intensity of these hunger crises one can get an idea of changes in their frequency. From the eighth to the tenth centuries, there was one every three years, in the eleventh to fifteenth centuries one every five years, in the sixteenth to eighteenth one every four years, in the nineteenth every nine years, and none in the twentieth century.

It is not possible to compare the importance of Japanese hunger crises with those in China or Europe. However, the nature of the Japanese and European diets was very different. Europeans had substantial consumption of meat, milk and other animal products which were absent in Japan. They had sufficient cereal production to make large quantities of ale and beer which the Japanese did not have. Land scarcity was much greater in Japan, and Japanese had to work much more intensively than Europeans. The combination of greater austerity and greater physical strain may well have made Japanese more vulnerable to hunger crises than Europeans, but the susceptibility was probably similar to that of Chinese.

A third major check to population comes from war. Here Japanese experience was very mild compared with China, and probably milder than in Western Europe.

China suffered major losses from the Mongol invasion of North China in 1234. The Mongols razed many cities, inflicted great damage on agriculture, enserfed or enslaved part of the rural population and displaced them by pastoralising cropland to make way for horses. Their later assault on South China in 1279 was much less destructive, but Mongol horsemen brought bubonic plague in 1353. Total population loss from the encounter with the Mongols was around 30 million.

The transition from the Mongol to the Ming dynasty did not involve substantial mortality. The next big disaster was the replacement of the Ming by the Manchus. The Manchu takeover was rapid in North China in 1644, but the struggle with Ming loyalists in the South lasted till 1683. The savagery of war, combined with smallpox and famine, reduced population by more than 20 million. There was also significant migration from mainland China. In the struggle with Koxinga who operated from Taiwan, the Manchus carried out a scorched earth policy on the opposite coasts of Kwangtung, Fukien and Chekiang provinces, burning crops and villages to a depth of about eight to 30 miles. There was significant move of population from this area to Taiwan, and a wave of "overseas" Chinese migrants to Southeast Asia (see Purcell, 1965).

There were other major population losses in the Taiping and other anti–Manchu rebellions in the 1850s and 1860s. As a result of these and associated famine and disease, Chinese population dropped by more than 50 million from 1850 to 1870.

China also suffered significant losses from 1840 to 1945 from aggression by West European countries, Japan and Russia and from its own civil war from 1937 to 1949.

Japan never suffered from foreign invasions, and the two main episodes of civil war in the latter half of the twelfth century when the first (Kamakura) shogunate was established, and from 1467 to 1568, were much smaller in their impact than the wars China experienced.

Table 1–8a. **Comparative Population Growth: Japan, China and Western Europe, 0–1998 A.D.**
(000)

	Japan	*China*	*Western Europe*
0	3 000	59 600	24 700
1000	7 500	59 000	25 413
1300	10 500	100 000	58 353
1400	12 700	72 000	41 500
1500	15 400	103 000	57 268
1600	18 500	160 000	73 778
1700	27 500	138 000	81 460
1820	31 000	381 000	132 888
1850	32 000	412 000	164 428
1870	34 437	358 000	187 532
1998	126 469	1 242 700	388 399

Source: China from Appendix B and Maddison (1998a): Western Europe from Table 1–6a: Japan from Farris (1985), Honjo (1935), Taeuber (1958), with some interpolation.

Table 1–8b. **Population Growth Rates: Japan, China and Western Europe, 0–1998 A.D.**
(annual average compound growth rate)

	0–1500	*1500–1700*	*1700–1850*	*1850–1998*
Japan	0.11	0.28	0.10	0.93
China	0.04	0.15	0.73	0.75
Western Europe	0.06	0.18	0.47	0.58

Source: Derived from Table 1–8a.

Table 1–8c. **Urbanisation Ratios: Japan, China and Western Europe, 1000–1890**
(per cent of population in towns of 10 000 inhabitants and more)

	Japan	*China*	*Western Europe*
1000	n.a.	3.0	0.0
1500	2.9	3.8	6.1
1820	12.3	3.8	12.3
1890	16.0	4.4	31.0

Source: Appendix Table B–14, de Vries (1984), Perkins (1969) and Ishii (1937).

A Precocious Demographic Transition in Tokugawa Japan

After a century of rapid expansion, Japanese population growth slowed markedly from the early eighteenth to the mid–nineteenth century.

The slowdown reflected a precocious transition to lowered levels of mortality and fertility, and to life expectation higher than the Asian norm. The transition was analogous in some respects to that experienced in West European countries from the mid–nineteenth to the twentieth century.

Japanese demographic records for the eighteenth century have certain deficiencies, but they are much better than those for earlier centuries. In the past 40 years they have been subjected to meticulous scrutiny by a new generation of historical demographers inspired by the pioneering and prolific work of Akira Hayami. As a result the interpretation of this period has changed completely. The eighteenth century slowdown was once attributed to Malthusian immiseration but is now characterised as a period of rising welfare.

There is little doubt that population was stagnant from 1721 to 1846 when the best Tokugawa statistics were available, and there is reasonable evidence that it was expanding much faster in the seventeenth century. There are grounds for believing that birth rates were relatively low and life expectation relatively high, but there is controversy about life expectation. The most credible estimates range from 32 to 37 years. The spread reflects uncertainty which arises from the absence of direct evidence on infant mortality and the need for inferential procedures as explained in the notes to Table 1–4.

The traditional method of family limitation in Japan (as in China) was abortion and infanticide. In the eighteenth century, family size was further reduced by late marriage, and lower levels of marital fertility. The change was induced by new institutional arrangements, rising per capita income and increased per capita labour inputs.

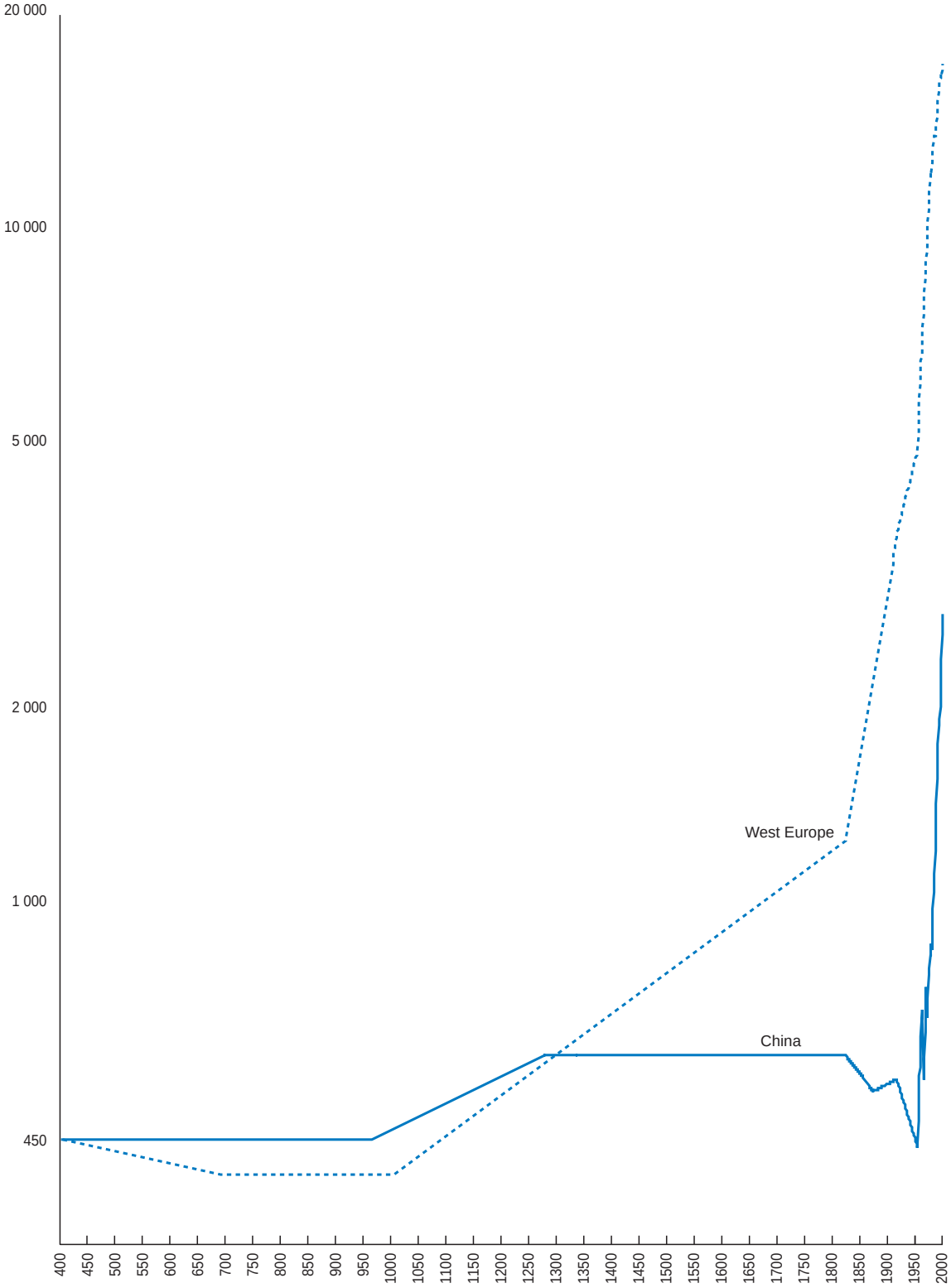
Early in the seventeenth century, the Tokugawa regime compelled its military elite (*daimyo*) to move their vassals (*samurai*) from the countryside to castle towns. The peasantry were no longer closely controlled, and were much freer to capture gains in productivity for themselves. There were large rice levies to provide stipends for the *samurai*, but these were more or less fixed and the tax burden declined over time.

In the seventeenth century, there were large land reclamation and irrigation projects, improved seeds, increased use of fertiliser. The proportion of land devoted to double cropped rice increased significantly, there was a rapid expansion of new commercial crops (cotton, sericulture, oil seeds, sugar and tobacco) and industrial by–employments. These changes brought increased real income, but required more intensive labour, with a particularly heavy additional load for women (Saito, 1996).

In these circumstances, large families came to be regarded as a burden. By reducing dependency, per capita income could be raised or more easily sustained. Family restriction was also socially acceptable. Villages had a collective responsibility to provide the compulsory rice levy, so the welfare of the whole village community was safeguarded by lower dependency rates. The danger that the family line would die out was covered by the widespread practice of adopting adults (e.g. sons–in–law) who would take over the family name and ultimately the family assets. The Japanese inheritance system was more or less equivalent to primogeniture with reversion to a single heir, rather than the system of partible inheritance which prevailed in China.

Japanese death and birth rates increased somewhat in the last quarter of the nineteenth century. Some of the rise may have been more apparent than real because of a change in official attitudes and practice. These changed from Tokugawa tolerance of abortion and infanticide to repression, and these practices were easier to detect because the new Meiji population registration system had much more effective coverage. However, Japanese family size and population growth continued to be fairly modest by subsequent standards elsewhere in Asia.

Figure 1-4. **Comparative Levels of GDP Per Capita: China and West Europe, 400-1998 A.D.**



Source: Appendices A, B and C. Vertical scale is logarithmic.

Figure 1-5. **Comparative Levels of GDP Per Capita, China and the United Kingdom, 1700-1998**

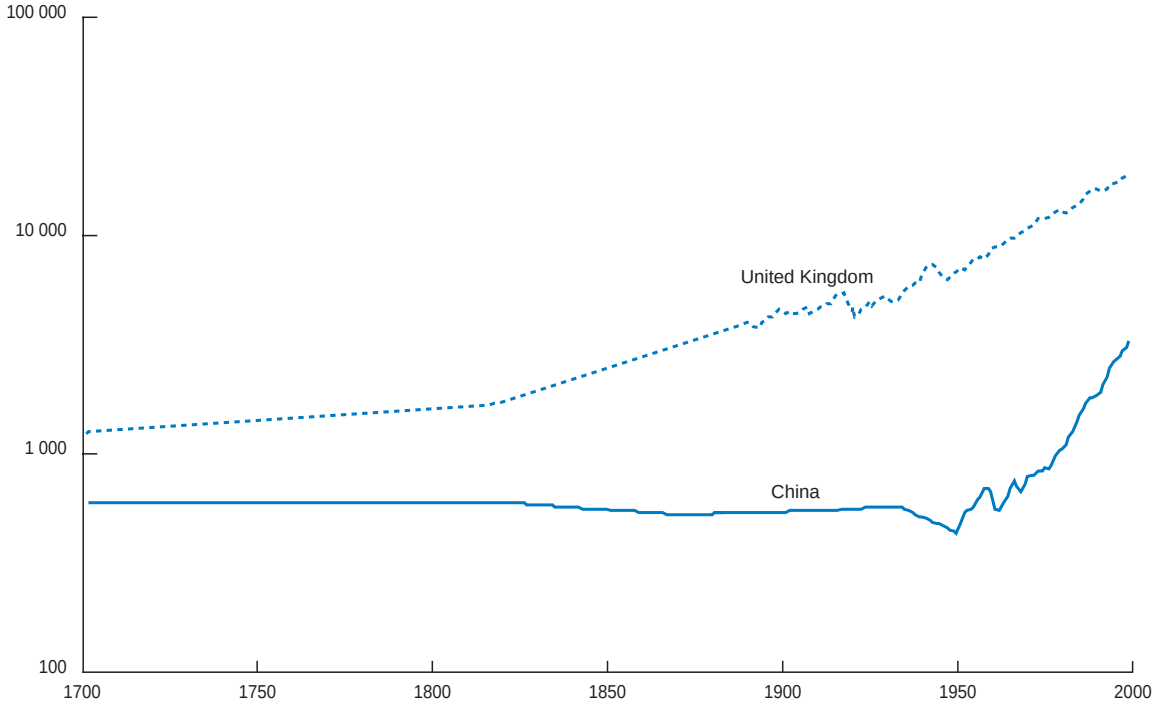
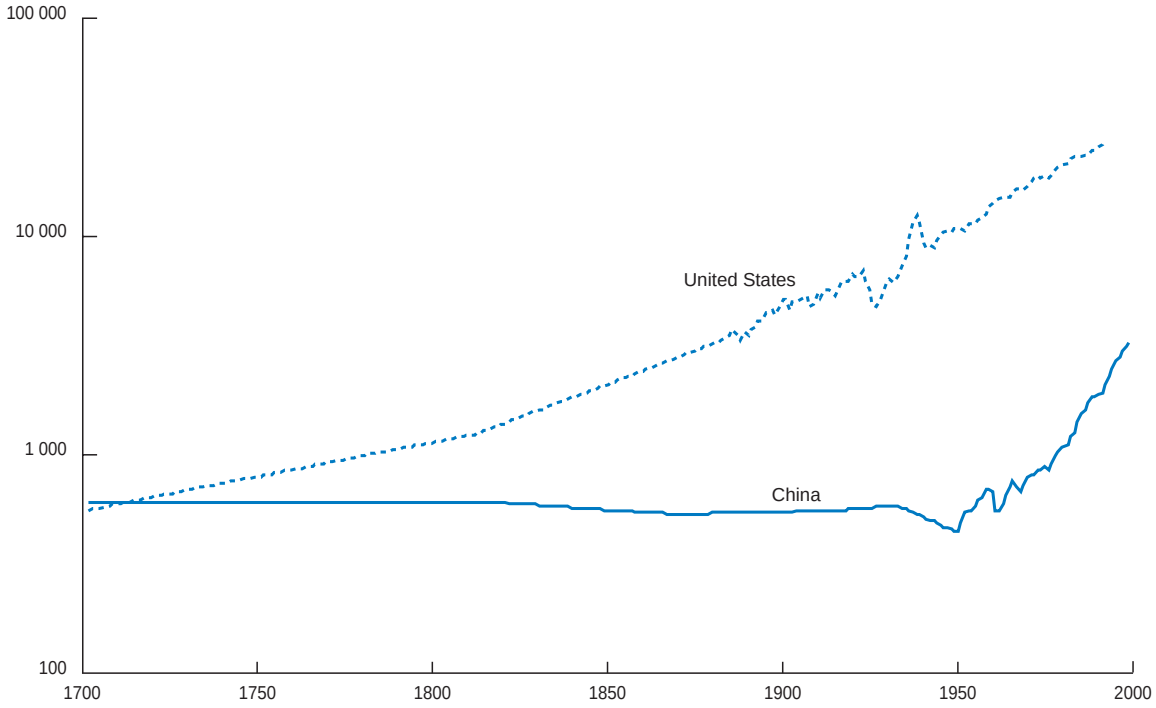


Figure 1.6. **Comparative Levels of GDP Per Capita, China and the United States, 1700-1998**



Source: Appendices A, B, C. Vertical scale is logarithmic.

II
GDP Per Capita

Long–term estimates of world GDP are very recent. Research on real income growth by quantitative economic historians has been heavily concentrated on Europe, and generally confined to the past two centuries. Until recently what was known about earlier centuries was in large degree conjectural.

Maddison (1995a) contained detailed estimates for different parts of the world economy for 1820 onwards, with a very crude provisional assessment for 1500 to 1820. Here I have made a much more careful scrutiny of the evidence for centuries before 1820 and incorporated the results of Maddison (1998a) on Chinese economic performance over two millennia. There is still a substantial degree of conjecture, but Appendices A and B present my evidence and assumptions as transparently as possible, so that critical readers can easily modify, adjust or augment my results where they find them open to question.

The level and movement of per capita GDP is the primary general purpose indicator of changes in well–being and production potential, but one should keep in mind that per capita consumption has increased less over the long run because of the increased share of product allocated to investment and government. Labour productivity does not always move parallel to per capita income. The advances achieved in Sung China (960–1279) and in Japan in the seventeenth and eighteenth centuries required substantial increases in per capita labour effort. In the twentieth century we find the opposite phenomenon. Labour input per person fell substantially in Western Europe and Western Offshoots (see Appendix E).

Table 1–3 summarises my findings for the past millennium. It shows clearly the exceptionalism of Western Europe's very lengthy ascension, and origins of the great divergence between the West (Group A) and the rest of the world (Group B).

The major conclusions I draw from the long term quantitative evidence are as follows:

a) West European income was at a nadir around the year 1000. Its level was significantly lower than it had been in the first century. It was below that in China, India and other parts of East and West Asia;

b) There was a turning point in the eleventh century when the economic ascension of Western Europe began. It proceeded at a slow pace, but by 1820 real income had tripled. The locus and characteristics of economic leadership changed. The North Italian city states and, in particular, Venice initiated the growth process and reopened Mediterranean trade. Portugal and Spain opened trade routes to the Americas and Asia, but were less dynamic than the Netherlands which became the economic leader around 1600, followed by the United Kingdom in the nineteenth century;

c) Western Europe overtook China (the leading Asian economy) in per capita performance in the fourteen century (see Figure 1–4). Thereafter China and most of the rest of Asia were more or less stagnant in per capita terms until the second half of the twentieth century. The stagnation was initially due to indigenous institutions and policy, reinforced by colonial exploitation which derived from Western hegemony and was most marked from the eighteenth century onwards;

d) West European appropriation of the natural resources of North America, introduction of European settlers, technology and organisation added a substantial new dimension to Western economic ascension from the eighteenth century onwards. Towards the end of the nineteenth century, the United States became the world economic leader;

e) Japan was an exception to the Asian norm. In the course of the seventeenth, eighteenth and the first half of the nineteenth century, it caught up with and overtook China in per capita income. The Meiji takeover in 1868 involved massive institutional change aimed at catching up with the West. This was achieved in income terms in the 1980s, but not yet in productivity;

f) The colonial takeover in Latin America had some analogy to that in North America, but Iberian institutions were less propitious to capitalist development than those in North America. Latin America included a much larger indigenous population which was treated as an underclass without access to land or education. The social order was not greatly changed after independence. Over the long run the rise in per capita income was much smaller than in North America, but faster than in Asia or Africa;

g) African per capita income was lower in 1820 than in the first century. Since then there has been slower advance than in all other regions. The income level in 1998 was little better than that of Western Europe in 1820. Population growth is now faster than in any other region — eight times as fast as in Western Europe;

h) The most dynamic growth performance has been concentrated on the past two centuries. Since 1820 per capita income has risen 19–fold in Group A, and more than 5–fold in the rest of the world — dwarfing any earlier advance and compressing it into a very short time span.

One may ask what is new in these findings. In the first place there is the quantification which clarifies issues that qualitative analysis leaves fuzzy. It helps to separate stylised facts from the stylised fantasies which are sometimes perceived to be reality. It is more readily contestable and likely to be contested. It sharpens scholarly discussion, and contributes to the dynamics of the research process. It is also useful to have a world picture because it helps to identify what is normal and what is exceptional.

My findings differ in some respects from earlier interpretations of the length and pace of Western Europe's economic ascension. There has been a general tendency to date it from 1500 when Europeans encountered America and first made a direct entry into the trading world of Asia. Max Weber attributed Europe's advance to the rise of protestantism, and this thesis attracted attention because it was congruent with the conventional wisdom about the beginning of the European ascension. I no longer believe that there was a sharp break in the pace of advance of per capita income around 1500.

Kuznets (1966, Chapter 1) suggested that "modern economic growth" is a distinctive economic epoch preceded by merchant capitalism in Western Europe "from the end of the fifteenth to the second half of the eighteenth century," and an "antecedent epoch of feudal organisation." In Kuznets (1973, pp. 139–41), he advanced what seemed to be a reasonable view about the rate of per capita GDP growth in Western Europe in the merchant capitalist period. In Maddison (1995*a*), I accepted Kuznets' hypothesis for his merchant capitalist period, but I now believe that growth was slower then than Kuznets suggested, and that the pace of advance between the eleventh and the fifteenth centuries was not much different. For this reason, it does not seem valid to distinguish between epochs of "feudal organisation" and "merchant capitalism". Instead I would characterise the whole period 1000–1820 as "protocapitalist".

I also differ from Kuznets on the timing of the transition to what he called "modern economic growth" (which I call "capitalist development"). The evidence now available suggests that the transition took place around 1820 rather than in 1760. The revisionist work of Crafts (1983 and 1992) and others has helped to break the old notion of a sudden take–off in the second half of the eighteenth century in England. Recent research on the Netherlands shows income to have been higher there than in the United Kingdom at the end of the eighteenth century. Work in the past twenty years on the quantitative history of other West European countries provides further reason for postdating the transition and modifying the old emphasis on British exceptionalism.

My analysis of US economic performance shows a rapid advance in the eighteenth century in contrast to the findings of Gallman (1972) and Mancall and Weiss (1999). The essential reason for the difference is that I include rough estimates of the indigenous population and its GDP as well as the activity of European settlers (I also did this for Australia, Canada and New Zealand).

My assessment of Japanese development differs from the conventional wisdom. I have quantified its economic performance in the Tokugawa period and compared it with China. Most analysts concentrate on comparisons between Japan and Western Europe in the Meiji period, and ignore the Asian context.

Table 1–9a. **Growth of Per Capita GDP by Major Region, 1000–1998**
(annual average compound growth rate)

	1000–1500	*1500–1600*	*1600–1700*	*1700–1820*	*1820–1998*
Western Europe	0.13	0.14	0.15	0.15	1.51
Western Offshoots	0.00	0.00	0.17	0.78	1.75
Japan	0.03	0.03	0.09	0.13	1.93
Average Group A	0.11	0.13	0.12	0.18	1.67
Latin America	0.01	0.09	0.19	0.19	1.22
Eastern Europe & former USSR	0.04	0.10	0.10	0.10	1.06
Asia (excluding Japan)	0.05	0.01	–0.01	0.01	0.92
Africa	–0.01	0.00	0.00	0.04	0.67
Average Group B	0.04	0.02	0.00	0.03	0.95

Table 1–9b. **Level of Per Capita GDP, Groups A and B, 1000–1998**
(1990 international dollars)

	1000	*1500*	*1600*	*1700*	*1820*	*1998*
Average Group A	405	704	805	907	1 130	21 470
Average Group B	440	535	548	551	573	3 102

Table 1–9c. **Population of Groups A and B, 1000–1998**
(million)

	1000	*1500*	*1600*	*1700*	*1820*	*1998*
Total Group A	35	76	95	110	175	838
Total Group B	233	362	461	493	866	5 069

Table 1–9d. **GDP of Groups A and B, 1000–1998**
(billion 1990 international dollars)

	1000	*1500*	*1600*	*1700*	*1820*	*1998*
Total Group A	14.1	53.2	76.1	100.0	198.0	17 998
Total Group B	102.7	194.0	252.9	271.8	496.5	15 727

Source for Tables 1–9a to 1–9d: Appendix B.

Gerschenkron (1965) and Rostow (1960 and 1963) both emphasised the idea that "take–offs" were staggered throughout the nineteenth century in West European countries. Kuznets (1979, p. 131) endorsed this view. In fact growth acceleration was more synchronous in Western Europe than they believed.

There are two schools of thought about the relative performance of Europe and Asia. The mainstream view was clearly expressed by Adam Smith in 1776. He was not a practitioner of political arithmetic but on the basis of the "price of labour" and other evidence, his ordinal ranking from the top downwards was as follows for the 1770s:

Netherlands

England

France

British North American colonies

Scotland

Spain

Spanish colonies in America

China

Bengal (depressed by the East India Company's plundering)

This mainstream view is reflected in Landes (1969, p. 13–14) whose overall assessment, like that of Smith, was similar to mine. "Western Europe was already rich before the Industrial Revolution — rich by comparison with other parts of the world of that day. This wealth was the product of centuries of slow accumulation, based in turn on investment, the appropriation of extra–European resources and labour, and substantial technological progress, not only in the production of material goods, but in the organisation and financing of their exchange and distribution ... it seems clear that over the near–millennium from the year 1000 to the eighteenth century, income per head rose appreciably — perhaps tripled."

In Maddison (1983), I contrasted the Landes view with Bairoch's (1981) assessment of relative income per head. He suggested that China was well ahead of Western Europe in 1800, Japan and the rest of Asia only 5 per cent lower than Europe, Latin America well ahead of North America, and Africa about two thirds of the West European level. This highly improbable scenario was never documented in the case of Asia, Latin America or Africa. His figures for these areas were essentially guesstimates. Bairoch consistently took the position that the third world had been impoverished by the rich countries (see Bairoch, 1967), and he was, in fact, fabricating ammunition for this hypothesis (see the critique of Chesnais, 1987).

In spite of its shaky foundations, Bairoch's assessment has been influential. Braudel (1985, vol. 3 pp. 533–4) acknowledged "the great service Paul Bairoch has rendered to historians" and believed "it is virtually beyond question that Europe was less rich than the worlds it was exploiting, even after the fall of Napoleon". Andre Gunder Frank (1998, pp. 171 and 284) cites Bairoch and suggests that "around 1800 Europe and the United States, after long lagging behind, suddenly caught up and then overtook Asia economically and politically". Pomeranz (2000) cites Bairoch more cautiously (p. 16) but his sinophilia drives him to the same conclusion. He suggests (p. 111), there is "little reason to think that West Europeans were more productive than their contemporaries in various other densely populated regions of the Old World prior to 1750 or even 1800."

Maddison (1983) contrasted the assessments of Landes and Bairoch and commented: "These remarkably different quantitative conclusions have very different analytical implications. If Bairoch is right, then much of the backwardness of the third world presumably has to be explained by colonial exploitation, and much less of Europe's advantage can be due to scientific precocity, centuries of slow accumulation, and organisational and financial prosperity."

In view of the laborious efforts I have since made to accumulate quantitative evidence on this topic, I now conclude that Bairoch and his epigoni are quite wrong. To reject them is not to deny the role of colonial exploitation, but this can be better understood by taking a more realistic view of Western strength and Asian weakness around 1800.

The major problem in growth analysis is to explain why such a large divergence developed between the advanced capitalist group and the rest of the world. There are, of course, some examples of past convergence, e.g. Europe's rise from its nadir to overtake China , the Japanese catch–up with China in Tokugawa times, and subsequently with the advanced capitalist group. Western Europe achieved a very substantial degree of catch–up on the United States in the golden age after the second world war; resurgent Asia (China, India, the so–called tigers and others) have narrowed their degree of backwardness substantially over the past quarter century.

In attempting to understand the causes of divergence and the possibilities for catch–up in different parts of the world economy, there is no universal schema which covers the whole millennium. The operative forces have varied between place and period. Chapter 2 attempts to illuminate the changes in the character of economic leadership and backwardness which have occurred over the past millennium.