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# DEMOGRAPHIC DISEQUILIBRIUM IN EARLY TWENTIETH CENTURY THAILAND

## Falling mortality, rising fertility, or both?

Gordon A. Carmichael

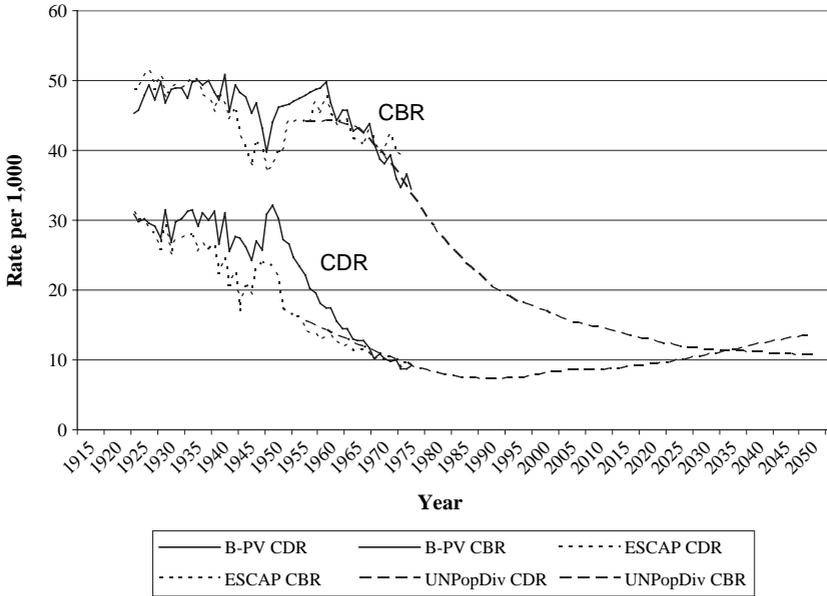
*Estimates of Thai crude birth and death rates date from 1920, when the former was around 20 per thousand higher than the latter, implying natural increase of two per cent per annum. Such disequilibrium cannot have been the norm over the long-term historical past, when population growth must have been comparatively slow. This paper explores the bases for likely past relative equilibrium between Siamese birth and death rates, then seeks to explain the disequilibrium apparent by 1920. Classic demographic transition theory postulates initially high birth and death rates, this equilibrium eventually being broken by falling mortality. In Thailand, however, there is likely to have been both significant mortality decline and appreciable fertility increase after 1850, as the virtual elimination of indigenous warfare, rapid growth of the export rice economy and the demise of slavery and corvée labour created a new domestic environment. Characterized by more dispersed, often frontier, settlement, this environment was unprecedentedly sedate and settled, afforded ordinary households a previously unknown level of control over their resources of labour, and generated optimism about prospects for the next generation.*

KEYWORDS: demographic disequilibrium; mortality; fertility; Thailand; manpower; rice economy; 'frontier' settlement

### Introduction

This paper arose from a request to document the demographic transition in Thailand as part of the 'look-back' component of a project titled *Thai Health-Risk Transition: A National Cohort Study* (Sleigh *et al.* 2008). In seeking to do this, it was found that estimates of Thai crude birth and death rates commenced in 1920 (Figure 1), and that as at that date and for some time thereafter, the former index was consistently around 20 per thousand higher than the latter, implying population growth from natural increase of the order of two per cent per annum. Earlier estimates in Figure 1 are derived from Bourgeois-Pichat (1959) as updated beyond 1955 by Vallin (1976), and from United Nations Economic and Social Commission for Asia and the Pacific (1976, pp. 50, 219); later estimates and projections to the mid-twenty-first century are derived from the United Nations Population Division (2007).

The lack of equilibrium between crude birth and death rates as of 1920 is stark and signals that demographic transition in Thailand commenced some time prior to that date. It is inconceivable that such disequilibrium could have existed for an extended period of the country's previous demographic history without its population at the 1919 Census



**FIGURE 1** Thailand: various crude death rate (CDR) and crude birth rate (CBR) estimates 1920–2047.

having been considerably larger than 9.2 million. Rapid population growth through the nineteenth and early twentieth centuries was not peculiar to Thailand; it was common throughout South-east Asia (Hirschman 1994). But Owen (1987b, p. 8) has commented that:

In trying to reconstruct the *longue durée* in Southeast Asian health, we begin with only the vaguest of demographic principles . . . approximation to demographic equilibrium. Given the population estimates we have for the sixteenth to nineteenth centuries and the power of geometric growth . . . it is virtually impossible that there should have been a sustained and substantial birth surplus throughout the region prior to the eighteenth century.

Sternstein (1965, p. 16) has noted that in analysing historical population estimates for Siam/Thailand ‘much depends on the definition of Thailand adopted’. Boundaries and degrees of control exercised over suzerain sub-regions change over time, and sources often do not make clear the precise areas to which their estimates refer. Still, relative equilibrium between Thai birth and death rates prior to the early 1800s is suggested by population estimates. Reid (1987) quotes 1.90 million in 1687 rising to 2.79 million in 1822 (a growth rate of 0.28 per cent per annum), and 2.2 million circa 1600 rising to 3.5 million circa 1800 (a growth rate of 0.23 per cent – the higher population estimates allegedly ‘allow for peoples likely to have been outside the purview of the Thai court’ (Reid 1987, p. 36)). What remain to be pondered are the bases of this equilibrium and its later disappearance. These issues are examined in this paper.

## Equilibrium Between Mortality and Fertility in the Historical Past

Was the crude death rate in Thailand once much closer to the level of the crude birth rate around 1920 (45–50 per 1000 total population), and if so, when, and by what means, did it fall to around 30 per 1000? Was fertility previously lower, so that rising natural increase through the nineteenth and early twentieth centuries was stimulated by an increase in the crude birth rate? Is a combination of both explanations likely to be applicable? What role in maintaining balance prior to 1800 might periodic crisis mortality have played?

Caldwell (2001, p. 4) has observed that ‘we will never have adequate information on pre-modern vital levels and trends for the Asian tropical periphery’. There are simply no sources (other than for the colonial Philippines) comparable to the parish registers that have permitted reconstruction of such levels and trends for Western Europe, or the more fragmentary records now being tapped for parts of China, Japan and India. Certainly there is nothing for Siam, necessitating a reliance on educated speculation.

Having mused on the possible role of polygamy, chiefly a royal prerogative whose demographic importance would depend on how far it was also practiced among the nobility, Reid (1987) (see also Reynolds 2006 on polygamy) is adamant (see, as well, Reid 1988, 1992, 2001) that the most important limiting force on pre-colonial population growth in South-east Asia was warfare, although not directly through battle casualties.

Much the most important factor inhibiting population growth . . . was probably the instability of residence brought about by warfare and raiding, voluntary and forced migration, the pioneering of new cultivation areas, and *corvée* obligations. Of all the possible factors keeping birth rates down, it is these that can most readily be seen to have changed in the nineteenth century. (Reid 1992, p. 461)

War did take a greater toll on human life with the advent, after 1509, of European firearms and the engagement, at times, of Portuguese mercenaries to use them (Reid 2001), but their effect was to some extent deterrent. Traditional South-east Asian warfare was governed by the principle of ‘emboxment’ (Baker & Phongpaichit 2005, p. 9), under which, rather than slaughter one’s adversary, the aim was to bring it under one’s suzerainty as a subordinate henceforth liable to deliver an annual tribute. The subordinate ruler was usually left in place, with the overlord looking to secure his ongoing loyalty by taking a daughter or sister as a wife, and perhaps a son to serve in his retinue.

Southeast Asian wars caused relatively few battle casualties. It was the primary objective of war to increase one’s own manpower, either directly by seizing the enemy’s subjects as slaves or captives or indirectly by so devastating his country that its inhabitants were obliged to move to one’s own. Lives were not therefore wasted in fighting. By contrast, the disruption and uncertainty caused by war was a critical demographic factor. (Reid 1988, p. 17)

This disruption affected food supplies through loss of field labour and destruction of crops, draught animals and irrigation systems, leading to famine, disease and higher mortality than would otherwise have prevailed. Nuptiality and marital relations were also affected. Men and women could be regularly separated for extended periods by military service, and relationship and family formation might also be undermined by sudden flight

into the forest or being carried off into captivity or slavery. Baker and Phongpaichit (2005, p. 5) claim that the 'sparseness' of population in the Chao Phraya basin encouraged slave raiding and war. Settlements were strung along rivers and coasts; forests that 'teemed with predators, including the germs of malaria and other jungle fevers' were ubiquitously at the doorstep. Should settlements become too large they were vulnerable to epidemic disease and looting, but they still needed to be large enough to keep the forest and predators at bay. The focus on augmenting manpower and its capacity, together with flight from epidemic disease, to rapidly relocate population was a major feature of the time. The effect on fertility of consequent uncertainty and instability could well have been negative. Writing of the century from the late 1300s to the late 1400s, when four Tai confederations vied for regional supremacy, Baker and Phongpaichit (2005, p. 10) observe:

... people were submitted to systems of mass conscription, the size of armies escalated, societies became more militarized, and a warrior ethic prevailed. Great armies traversed the landscape, destroying cities, forcibly moving people, devastating crops, and provoking epidemics.

Reid (1988, p. 17) notes that these armies were typically 'ill-organized ... without providing adequate supplies either for the soldiers or for their families left behind'. Elsewhere, he writes (1992, p. 462) that 'Hunger and disease were inevitably the result of these unwieldy campaigns. If the war went badly, the odds were against soldiers ever returning to their families'. Even successful campaigns could exact huge tolls to starvation and disease. Moreover:

Perhaps [an] important factor demographically was the need to be constantly ready for flight in troubled times. This probably meant avoiding further births at least until older children were able to run by themselves. (Reid 1987, p. 42)

Owen (1987a, p. 52) concurs:

The constant fear of attack and the consequent need for mobility would ... have been a powerful incentive to longer birth intervals; a woman might flee with one babe in her arms, but not two or three.

Accounts of the pre-eminent Siamese Kingdom of Ayutthaya between the founding of the city of that name in 1351, ironically following flight from a smallpox epidemic to its north, and its final sacking by the Burmese in 1767 (e.g. Wyatt 1984) are tales of regular, although not continuous (Baker 2001; Baker & Phongpaichit 2005), military engagements with other kingdoms in the region. Baker and Phongpaichit (2005) distinguish a fifteenth century 'era of warfare', ultimately 'inconclusive' because, over the distances involved, permanent emboxment was not possible, from an 'age of commerce' that flourished through the seventeenth century. This saw wealth and trade links derived from a favourable location 90 kilometres north of present-day Bangkok, together with the military advantage conferred by access to Portuguese guns and mercenaries, greatly enhance Ayutthaya's capacity to embox. Of particular relevance to possible levels of fertility over the Ayutthayan period are the systems of manpower control that operated (Panananon 1982).

Concerning these, Wyatt (1984, p. 71) writes:

Economically and politically the state was constructed on the claim of the ruling class to the manpower that resided in its territory. All freemen were obligated to render six

months' labor each year to the crown and could be employed on public works or in military service. . . . territorial officers appointed by the government . . . were responsible for keeping track of the freemen assigned to them and producing them when they might be required. Such territorial, bureaucratic control . . . stood in sharp contrast to the traditional Tai patterns of freemen customarily rendering service to personal patrons. . . . [It] was neither easily nor completely accomplished. Freemen naturally preferred the flexibility and personal quality of the traditional patron–client relationship . . . and constantly sought means to evade [the alternative system]. . . . The natural tension between personal and bureaucratic control over manpower was to prove a persistent dynamic in [Ayutthaya's] history.

Similarly, Baker and Phongpaichit (2005, pp. 15–16) observe:

Over the era of warfare, all men (and some women) outside the noble ranks had been brought within systems of servitude and forced labour. . . . most freemen [*phrai*] were registered on a conscription roll and placed under an overseer who was responsible for mobilization. . . . Conscripts served on a rotational basis (alternate months, or alternating half-years). As warfare diminished, these corvée forces were transferred to other tasks such as building temples and palaces, carrying palanquins, rowing boats, or loading the trading junks. The kings and great noble-officials controlled this forced labour and sometimes competed over it. . . .

War prisoners were excluded from this system, and had a status [*that*] . . . usually translated as 'slave'. Others could sell themselves into [*that*] status [Panananon (1982, p. 333) describes this as 'voluntary, self-contracted servitude', often entered because it offered a preferable existence to that of a poverty-stricken *phrai* with corvée obligations], or be forced into it by debt or as punishment. Household heads could sell their wives and children. This slave status was hereditary. . . . These systems of labour control were so comprehensive that European traders found it difficult to hire people unless they worked through the labour-controlling aristocracy. Even then, they occasionally found the labour supply dried up when people were needed for military expeditions or great construction projects.

Gender roles differed sharply by social status. Among ordinary people, women did at least their full share of work. Visitors [of the time] noted that women 'do most of the work' in Siam. Some attributed this to the corvée system which removed men from the household for up to half the year.

The mass conscription of the fifteenth century did begin to meet resistance later on. 'People bribed the military recruiting agents, melted into the monkhood, or fled into the forests' (Baker & Phongpaichit 2005, p. 13). Indeed, serious breakdown of the bureaucratic system would ultimately be Ayutthaya's undoing. *Phrai* evaded their labour obligations by avoiding registration or being allowed to commute them into annual payments in kind as the export economy developed. Moreover, control over manpower became fragmented as a lack of strong, durable political institutions led individuals to align with all manner of princes and officials (who demanded less of them) rather than one central authority. Thus, when Burma attacked in the 1760s, Ayutthaya found itself unable to mobilize adequate manpower for defence (Wyatt 1984). And this was no attempt at emboxment. On this occasion the objective of an ambitious new Burmese dynasty was Ayutthaya's obliteration

as a rival centre of power. The objective was achieved, surrounding areas being heavily depopulated.

It seems highly likely that the semi-slavery of *corvée* labour, its capacity to separate the sexes for extended periods (especially when applied militarily), its implications for women's work around the home (perhaps reflected in high levels of miscarriage and sub-fecundity), widowhood flowing from military *corvée*, the genuine slavery to which war captives and others might be subjected (Panananon 1982), and periodic resettlements of substantial populations as spoils of war collectively had a significant depressing effect on Siamese fertility prior to 1800. These forces denied the bulk of the population a settled, sedate domestic existence, and together with high, and from time to time crisis, levels of mortality, this probably conspired to produce very slow long-term population growth. Caldwell (1967, p. 28) may well be right in claiming that 'It was undoubtedly disease . . . which played the major role in limiting [Siamese] population growth', but there is good reason to suspect that fertility was constrained compared to its level of the 1920s as well.

### Nineteenth Century Population Growth

What changed after 1800? Owen (1987a) has described nineteenth century population growth in South-east Asia as a 'paradox' for which a variety of explanations have been advanced, and Hirschman (1994, p. 396) has written that:

One of the most debated issues among demographers and historians is the reported high rates of population growth in nineteenth-century Southeast Asia. Initially, there was considerable uncertainty over whether the high population growth rates during the colonial era could really be believed.

Siam, of course, taking advantage of its buffer location between British Burma and French Indochina and pragmatic ceding of territory from the late eighteenth century that roughly halved its area of suzerainty, was never colonized (Tarlign 1992; Baker & Phongpaichit 2005). It nevertheless had regular interaction with colonial powers and became subject to the same Western economic forces and social models as Kings Mongkut (who in 1855 negotiated the Bowring Treaty with Britain that signalled the opening up of Siam to those forces and models (Trocki 1992)) and Chulalongkorn (who continued this process during 1868–1910) sought to preserve the country's independence. An early argument fuelled by the disbelief Hirschman notes was that rapid nineteenth century population growth was illusory – a statistical artefact of improved record-keeping and hence appreciable relative undercounts of population at earlier dates. This explanation has, however, been dismissed as partial at best, and rapid growth is now accepted as reality (Owen 1987a; Reid 1987, 2001; Hirschman 1994).

Reid (1987, 2001) associates the transition to rapid population growth through most of South-east Asia with the establishment of internal peace and stability (i.e. sharply reduced warfare among indigenous elites) following colonial intervention. He dates this from 1735 for the Philippines and 1755 for Java, claiming (2001, p. 53) that it was 'likely to have increased the birth rate as well as reducing the death rate'. Of Siam, he writes (1987, p. 35):

The Chakri dynasty . . . was also able to preserve conditions of relative internal peace from about 1800 onwards, which is probably the reason that Siamese numbers grew so

rapidly in the nineteenth century, though not as rapidly as those of the colonially ruled areas.

Sternstein (1965, 1984) devoted considerable effort to trying to establish the trajectory of Thai population growth (based on current, or post-1909, boundaries) through the nineteenth century. He derived a range of possibilities based on analyses, first, of 'eyewitness' population estimates and second, of the growth of Bangkok, ultimately expressing a preference for a pattern featuring (1984, p. 50):

... an imperceptible rise of population numbers to somewhat more than two million in the mid-nineteenth century and, thereafter, a relatively rapid and ever-increasing rise in the rate of growth to bring the population to some five million at the turn of [the twentieth] century.

In other words, Sternstein thought rapid population growth in Thailand during the nineteenth century had been concentrated in its second half, and especially its latter decades, spilling over into the early 1900s.

Relative peace and stability aside, several other factors are also adduced to have produced rapid population growth in South-east Asia. One is 'a reduction in the frequency of crisis mortality episodes' (Hirschman 1994, p. 414). The detailed history of such episodes remains elusive (Owen 1987b), and this is no less the case for Siam where the nature of specific 'great sicknesses' mentioned in chronicles will never be known with certainty (even if Terwiel (1987) does note clear evidence from the fourteenth century onwards of smallpox being a regular scourge, with Fenner *et al.* (1988) locating severe epidemics at 1563–1564, 1621–1623 and 1749–1750). A second factor is expansion of wet rice farming in areas like the Central Thai Plain in response to the growing world and regional markets for rice under colonialism. Terwiel (1983, 1989) describes ever increasing dominance of rice in the Thai export economy after 1860, the average annual rate of growth in rice exports exceeding five per cent between then and 1910, by which date rice accounted for 80 per cent of all exports by value (compared, according to Owen (1971), to 2.7 per cent in 1852). Syamananda (1977, p. 130) similarly shows an eight-fold increase in the annual volume of rice exported between 1870–1874 and 1910–1914. The bases of this rapid expansion of rice production, part of a regional trend begun much earlier in Bengal, Java and Burma (Coclanis 1993), were growing regional and international demand, the aforementioned Bowring Treaty, the advent of steamships for conducting international trade, and the opening in 1869 of the Suez Canal. The Bowring Treaty ended centuries of royal control over rice exports, which had been 'sporadic' anyway because the priority was always domestic needs and there existed 'a profound fear of famine' (Owen 1971, p. 83). It set a fixed export duty for rice of 0.16 baht per picul, which in 1855 was a 10–13 per cent *ad valorem*, but had fallen below three per cent by the early 1900s.

According to Hirschman (1994, p. 397), citing Geertz (1963), 'the demographic absorptive capacity' of wet rice communities far exceeds that of most other crops. Throughout South-east Asia the labour intensity of wet rice cultivation and associated construction and maintenance of irrigation and drainage systems, the establishment of permanent settlements where shifting cultivation formerly had predominated, and the availability of a more stable food supply were conducive to higher fertility and to mortality staying (p. 399) 'within normal bounds'. There occurred 'a transformation of the social and economic fabric of community life' (Hirschman 1994, p. 397). Owen (1971) asserts that the

expansion of paddy acreage in Siam was unique in occurring largely within an area that was already populated and cultivated, but this paints a simplistic and misleading picture of what occurred.

Baker and Phongpaichit (2005) describe a transformation of both the landscape and the society of the lower Chao Phraya basin from the mid-nineteenth century through (p. 81) 'a frontier movement of peasant colonization'. It was part of a major regional 'peasantization' fostered by colonial powers attracted to the image of the 'somnolent peacefulness . . . of the self-sufficient and harmonious village community' (Reid 2001, pp. 54, 56). It received real impetus from the 1870s, when King Chulalongkorn moved to halt development in the area of a landed nobility by allotting land on new canal projects and uncultivated tracts repossessed from large landlords to peasant families. In the 1820s the Chao Phraya delta was largely 'wilderness'.

Plains of scrub forest inhabited by wild elephants merged near the coasts and rivers into marshes dense with reeds and teeming with crocodiles. Settlements clung to the banks of the main rivers. . . . most of these banks looked 'deserted' and densely wooded. (Baker & Phongpaichit 2005, p. 81)

By 1850, three-quarters of the delta remained unoccupied, but over the next century the settlement of an average of 7000 households annually transformed it into 'a lattice of canals with almost every square inch of land under cultivation' (Baker & Phongpaichit 2005, p. 82). Peasant colonization also expanded in areas away from the canals, where claims to empty land could be staked and certificates of right to occupy gained as long as the land was brought into cultivation.

The rice frontier changed not only the landscape, but also the social geography. Previously, most people lived clustered close to a *mueang* [city-state political unit] centre. Now they spread across the landscape as villages sprang up along the waterways throughout the paddy tracts. . . . Most farmers broadcast rather than transplanted paddy, and . . . [u]se of fertilizer was almost unknown. The yield per rai [an area 40 metres by 40 metres] of this simple regime was very low. But, because of subtropical conditions, the natural fertility of river silt, and plentiful land, the yield *per person* . . . was higher than anywhere in Asia, even intensively cultivated Japan.

The natural environment also supplied other foods (fish, vegetables, fruit), the raw materials for tools and housing, herbs for medicine, and household fuel. . . . The production system was highly geared to self-reliance. . . . the household waited until it saw the yield of the current harvest before selling off the surplus of the previous one. . . . [Aside from] limited landlord tracts, this was a smallholder society with families owning plots of 25–40 rai [10–15 acres] which they could operate with their own labour, growing rice for family consumption and a surplus for sale. (Baker & Phongpaichit 2005, pp. 85, 86 and 89)

Citing the scrapping of a major irrigation and drainage scheme in 1903 because it was deemed a higher priority to invest in railroads, Owen (1971, p. 79) argues that 'hydraulic engineering' had 'almost nothing' to do with the expansion of Siam's rice acreage. Bray (1986, p. 96) describes the bringing into production of an 'almost uninhabited' landscape though construction of 'creek-style waterways and poldered fields . . . in large numbers' to harness a natural annual flood cycle. Private enterprise may

have had limited involvement, but smaller government canal-building schemes were obviously supplemented by considerable peasant irrigation and drainage activity. Smallholder rice farming was clearly very labour intensive, and there was ample opportunity to expand as children, for whom there was suddenly a clear future, grew to adulthood. This, combined with relative internal peace and prosperity and the demise of *corvée* labour and slavery, probably boosted fertility, as well as lowering mortality through such mechanisms as improved food security and nutrition, the inhibiting effect on the spread of disease of more dispersed settlement, and the extra flexibility cash incomes offered peasant households 'to do something to save an endangered life' (Caldwell 1967, p. 28).

Panananon (1982) describes a transition from (p. 292) 'property rights in man to property rights in rice land' which, by the end of the nineteenth century, saw (p. 297) 'the wealthy beginning] to put their investment into buying land instead of buying *that* [slaves].' Cultivable land had always been so abundant that it 'held little or no collateral value', whereas labour, being 'scarce', had had considerable collateral value (Panananon 1982, p. 292). However, this situation began to change as a consequence of the Bowring Treaty and the rising demand, and hence price, for rice after 1855. The development of the rice economy brought a switch from shifting and transplanting methods of paddy cultivation to broadcasting, which although less productive per unit of area than transplanting, provided the optimal return per unit of labour applied. Thus, a situation arose where economic advancement was possible through expansion of household labour and commensurate expansion of the area cultivated.

The period during which wet rice cultivation expanded to consume the entire Chao Phraya delta was a 'frontier' period, and there is every reason to imagine it boosted fertility in much the same way as Vanlandingham and Hirschman (2001) argue was evident in frontier areas of the country in the early 1950s. Using provincial data from the 1960 Thai Census and focusing on 59 of 71 provinces that were 'predominantly rural', they establish markedly higher fertility during 1950–1954 in 'frontier' provinces, defined as those with relatively low densities of population in 1947 per unit area of potentially cultivable land (defined as the amount of land actually under cultivation in 1978). Multivariate analysis shows the relationship operating to a greater extent than anticipated directly rather than through marriage patterns, leading to a conclusion that:

... a surprising amount of control of fertility within marriage is apparent. We speculate that some degree of the regional variations in marital fertility between the frontier and densely-settled areas could be due to changes in coital activity that may be related to perceptions of the ability to support a large family and to bequest land to children. ... Thai parents in the early 1950s appear to have considered the availability of agricultural land one generation hence in their childbearing decisions. (Vanlandingham & Hirschman 2001, pp. 245–246)

Vanlandingham and Hirschman (2001) further raise the likelihood that fertility was similarly boosted in the late nineteenth and early twentieth centuries in areas that at that time were frontier:

The region experienced an explosive increase in international trade, resulting in an expanded market for rice exports. Settlement of the surrounding jungle became profitable, albeit constrained by a lack of labour. It is our contention that these

demographic and economic changes encouraged migration to underpopulated regions and led to relatively high fertility among the inhabitants of these newly settled areas. (Vanlandingham & Hirschman 2001, p. 235)

Turning to the issues of *corvée* labour and slavery, these did not disappear when Ayutthaya did. As of 1800, 'The control of manpower [remained] the key to power in Thailand' (Feeny 1989, p. 288). As Bangkok developed as the new capital, among the indigenous (as distinct from the Chinese) populace:

... the old Ayutthayan society of personal bonds, formal hierarchies, and unfree labour had been substantially revived. During forty years of war and disorder [following the sacking of Ayutthaya], old systems of labour control had been reimposed. Every freeman was legally bound to [an] overseer. Through to the 1840s, conscripted armies were used on the eastern expeditions. ... Conscript labour was also used for the upkeep of royalty and nobility, the construction and maintenance of the capital, and collection of goods for the export trade. At the capital, much of the official nobility was engaged in marshalling and directing these resources of unfree labour.

In provincial areas, servitude was even more marked. The first European observers in these areas reported that 50 to 90 per cent of people were in some form of 'slavery'. (Baker & Phongpaichit 2005, p. 42)

It is estimated by Feeny (1989) that in the mid-nineteenth century between a quarter and a third of Thailand's population were slaves, or *that*. Ending labour controls, however, became 'the priority' in King Chulalongkorn's reformist agenda after 1868 (Baker & Phongpaichit 2005, p. 52). There had been some reforms to the *corvée* system earlier in the nineteenth century. King Yotfa (1782–1809), after noting that it 'caused the *phrai* much unhappiness', had reduced the *corvée* obligation to one month in three, and his son, King Loetla (1809–1824), reduced it further to one month in four. However, these three-shift then four-shift systems continued to attract criticism and resistance, first because they imposed unequally on households during key months of the annual rice-growing cycle, and second because in requiring less *corvée time* they tended to result in increased *intensity* of *corvée* demands (fewer men doing the same jobs) (Panananon 1982, pp. 134–137). King Chulalongkorn also followed the lead of his father, King Mongkut (1851–1868), who shortly before his death issued an edict requiring wives to consent before they or their children could be sold as *that*, and who argued for the abolition of slavery to free labour for the market economy. Colonial powers had become very critical of the constraining effect on the economy of Siam's system of manpower control, and also argued that a country that practised slavery could not be considered civilized. Chulalongkorn was additionally, and indeed almost certainly primarily, motivated by wanting to wrest control over manpower from powerful nobles and officials and to centralize political power in Bangkok (Feeny 1989). In the words of Panananon (1982, p. 171), 'he wanted not only to reign but also to rule', and to restore to the Chakri family power assumed by the influential Bunnag family and its associates.

The process of reform was gradual, not least to blunt opposition from those whose economic and social status it threatened, and accompanied by a degree of natural emancipation as the rice economy developed. King Chulalongkorn originally planned to abolish *that* status in 1872, but was persuaded not to proceed because of (i) concern over the difficulties (and reactions?) that would be generated among *that* owners by rapid loss

of their labour and investments, and (ii) concern that *that* themselves would have difficulty adjusting to overnight emancipation (Panananon 1982). The abolition Act was not finally promulgated until 1905, and nationwide abolition was not finally completed until 1915 (Feeny 1989, table 4). However, in October 1874, a First Emancipation Decree was issued. This regulated the price of *that* children born on or after 13 April 1868 (whether born or sold into servitude) and provided for them to become automatically free upon reaching their twenty-first birthdays. Furthermore, beyond their fifteenth birthdays this cohort could no longer be sold as *that* without their written consent, and no cohort member could, after reaching age 21, pledge himself, or be pledged, as *that*. Thus, from 1874 a system was set in place that would gradually abolish slavery over time, yet minimize opposition because it would have limited immediate impact on owners, and provide emancipated persons with time to plan their futures. In focusing on children it also allowed the King to claim moral high ground under Buddhism, which he did by describing the treating of children born to *that* as automatically *that* themselves as *mai karuna* (unkind) and *mai yuttitham* (unjust) (Panananon 1982, pp. 215–220). His motives were partly moral, partly a desire to modernize Siam, and partly the aforementioned desire to undermine the power of others. The decree did not yield major immediate dividends in these latter terms, but Chulalongkorn was young and could afford to wait. In ensuing years it:

... continued to work quietly and progressively to the advantage of the King and government. ... No one could any longer accumulate manpower in the form of young *that*, nor could one convert young men that should have been *phrai* to be *that* as many had previously done. Thus many individuals were deprived of a corrupt source of wealth and an accumulation of manpower in the form of young *that*. (Panananon 1982, p. 232)

Aside from the legal constraints it imposed, the 1874 decree also interacted with the development of the rice economy in ways that would see *that* status lose much of its attraction to both parties. Hence, the element of 'natural emancipation' referred to earlier. Abolition had been deferred, but the fact that it was now firmly on the agenda created uncertainty and a 'psychological backlash' among the wealthy that saw them increasingly less willing to invest in *that* (Panananon 1982, p. 305). Land values rose 'astronomically' as the rice economy expanded, while labour costs increased far more slowly given abundant Chinese labour and the gradual release of *that* onto the free labour market. In consequence, speculation in land became the sensible investment.

Though [they] needed manpower for their rice cultivation, good lands suitable for rice production supported by the prosperity of the rice economy would ... attract renters, tenants and sharecroppers. ... hired labor at a cheap rate [was] much less risky than to secure the labor of *that* in this period ... [and] the wealthy would not have to be bound to traditional social obligations of masters and *that*. (Panananon 1982, p. 316)

For their part, as poor *phrai* found the wealthy less willing to take them and their families as *that*, they were forced to look for other means of economic survival. The obvious answer was some form of participation in the rice economy, and as it grew *that* status lost its appeal anyway. *That* had been attractive to poor *phrai* prior to 1850 as a 'safety-first' option. Given the prevailing economics of rice production, pledging oneself and one's wife as *that* at least ensured there would be no deficit at the end of each year. But as the price of rice rose, these economics changed to a situation where, whether as

peasants cultivating their own land, share croppers, tenant farmers or field hands, *phrai* 'would almost certainly earn something by the end of the year' whereas 'they would earn nothing if they became *that*' (Panananon 1982, p. 315). The rice economy offered almost everybody some sort of prospect of economic advancement.

Dismantling the *corvée* system was more complicated, because it was the source of military personnel. It had in fact already been considerably undermined before Chulalongkorn assumed the throne. Commercialization from the 1830s saw money increasingly accepted in lieu of *corvée* service to the crown. Indeed, this was one way royalty competed with the nobility's less onerous labour demands – many *phrai* were attracted to a *corvée* obligation they could discharge fiscally – and '[B]y the 1850s, the returns from commutation had become the largest item of royal revenue' (Baker & Phongpaichit 2005, p. 44). *Corvée* was also avoided in various ways – by melting into forests and remote areas, by selling oneself and one's family as *that* and seeking the protection of undemanding patrons, and by bribing officials to be reclassified in registers into categories (such as *that*) that were *corvée*-exempt. Thus, Baker and Phongpaichit (2005, p. 44) write that 'By Prince Damrong's estimate in the 1870s, four-fifths of males evaded the *corvée*'. By this time the rising price of rice had made the *corvée* commutation fee much more easily affordable. Panananon (1982, p. 299) estimated that in 1870, it equated to less than one-fifth of the volume of rice it had represented before 1850.

From 1893, Provincial Governors had to submit tasks for which they proposed using *corvée* labour to the central government for approval, and in 1899, Chulalongkorn completed the monetization of non-military *corvée* by replacing labour obligation with a universal head tax. Then, between 1900 and 1910, military *corvée* was replaced by a system of conscription to a standing army. Thus it was that 'commoners with *corvée* obligations were converted . . . into taxpaying, draft-eligible citizens' (Feeny 1989, p. 293). More broadly, as the smallholder rice farming society evolved, autonomy to pursue a family-focused domestic existence, one with a far greater measure of household control over male labour in particular and offering better prospects for the next generation, was also being greatly enhanced. Conditions were ripe for fertility to have risen.

Also under King Chulalongkorn, state concern for citizens' health and a switch from traditional to modern medicine began to develop. In 1881, 48 temporary hospitals were set up to deal with severe cholera epidemics, but they were disbanded once the outbreak subsided (Porapakkham 1986). In 1888, the first permanent hospital, Siriraj Hospital, opened to the public, and the Department of Nursing was established. The Royal Medical College was founded in 1889 to begin a new medical and public health era in Thailand, and a linked midwifery school financed by the Queen opened in 1896 (Porapakkham 1986). A smallpox vaccine-producing centre was set up in 1901 out of which would grow the National Vaccine and Serum Laboratory, and several plague outbreaks between 1904 and 1906 led to the issuing of public health regulations aimed at preventing both plague and cholera. A start on improving sanitation was also made. The first law with this focus, the Local Sanitation Enactment, was promulgated for Bangkok in 1897, and provided for appointment of both a Medical Officer of Health and a Sanitary Engineer (Varavarn 2000). Then, subsequently, in 1908, the Provincial Sanitary Organization Law created Sanitary Boards for towns and other communities, charging them with maintaining cleanliness, prevention and treatment of diseases, and upkeep of roads. Their coming under the supervision of the Medical Department of the Ministry of the Interior in 1915 is claimed to have marked the inception of a national public health policy (Varavarn 2000). In 1917, an

Act mandating the registration of births and deaths, and regular population censuses, provided for the development of an information base to better guide subsequent health policies. These initiatives may have had modest impact on Thai mortality around the time they were taken, but they established a foundation upon which other initiatives with far greater impact would build.

In addition to the possible contributions of rising fertility and declining mortality to population growth during the late nineteenth and early twentieth centuries, it must also be acknowledged that immigration played a significant role. Centre stage was the arrival of thousands of Chinese, especially after 1870, as they took over all aspects of the booming rice economy save cultivation. The Chinese had established Bangkok as a trading post before it became the seat of government, and by 1828 it is estimated that 'three-quarters of Bangkok's population was Chinese and ... half the balance was at least partially of Chinese descent' (Caldwell 1967, p. 32). They filled an urban void to which ordinary Siamese were not attracted, and soon owned most of the rice mills and controlled the rice market. From the government's perspective, the Chinese influx provided a source of hired labour that was more efficient than reluctant *phrai*; it was better off using commutation income to pay these workers and leaving *phrai* to concentrate on their rice cultivation, where their greater endeavour than as reluctant *phrai* labourers would boost revenue from land tax and export duties.

By 1850, the gross intake of Chinese was around 15,000 per year and during the first decades of [the twentieth] century the net intake averaged at least 40,000 per year. Between 1900 and 1930, this immigration probably accounted directly for at least one-third of all population growth, and, if we include locally born children, perhaps two-fifths. (Caldwell 1967, p. 32)

Thus, rapid population growth in the late nineteenth and early twentieth century Thailand was not solely the product of diverging birth and death rates, but they were clearly the major factor. And while the relative importance of rising fertility and falling mortality can only be guessed at, the odds do seem to be that divergence, and not just decline in mortality, was involved.

## Discussion

Motivated by the observation that the earliest available estimates of Thai birth and death rates do not disclose the sort of equilibrium typical of populations yet to begin demographic transition, this paper has sought to better understand the origins of the disequilibrium apparent at that time. The likelihood is that mortality in Thailand did decline through latter decades of the nineteenth century and the first two of the twentieth, as more dispersed settlement constrained the spread of epidemic disease, transition to a smallholder-based cash economy improved nutrition, food security and household capacity to respond to ill-health, and public health initiatives began to be taken. But it is also highly likely that fertility rose, contributing appreciably to the separation between birth and death rates evident as of 1920.

Two forces were probably crucial to such a trend. One was the development, as wet rice farming expanded, of a far more dispersed pattern of settlement whose 'frontier' character both commended larger families to provide the labour needed for this type of endeavour in a challenging environment and created considerable optimism over the

opportunities available to the next generation. The second force was the demise of corvée obligations and slavery, which facilitated a more sedate and 'normal' domestic existence for ordinary people. Households now had much fuller control over their resources of male labour; children were no longer being born into varying degrees of servitude; men were less frequently absent from the home, with obvious implications for household and marital relations; and in theory at least, the domestic burden on women was lessened. With involvement in military conflict suppressed by forces unleashed regionally by colonialism, a modicum of control probably established over disease, and food security likely at all-time high levels, ordinary Thais had almost certainly never had it so good. The climate for childbearing was unprecedentedly favourable.

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