DEBATES

The Demographic Causes of the Industrial Revolution - Some Qualifications

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In an interesting article (*ante* vol. XXIII (1994)), Julian Simon argues that, though China and India were different, 'increased European population density, and the economic development in the eighteenth and nineteenth centuries were the fundamental causes of each other'. With much that he says one can readily agree. But I think he claims too much for population growth, and, in view of the question's importance today, I shall seek to add nuances to his picture firstly in connection with the British Isles and then, more tentatively, in regard to China.

To begin with a minor point, Dr. Simon highlights the shift, associated with industrialisation, of labour out of agriculture and refers to an 'absolute' drop in the number of British agricultural workers (Simon, pp. 148-9). There was certainly a decline in the relative, and eventually also in the absolute, numbers engaged in agriculture. But in fact agricultural numbers continued to increase until 1851 (Mitchell with Deane, p. 60). It is possible to argue that, after coming under great pressure in the decade or two decades following the 1815 peace, real wages had already begun to turn up by the middle of the century. But clearly the labour market was then still oversupplied (especially in southern England), Caird noting the system whereby rate-payers agreed 'to divide amongst them the surplus of labour, not according to their respective requirements, but in proportion to the size of their farms' (Caird, p. 515; Dunbabin, pp. 65-6). Population growth, though of importance in providing migrants to the manufacturing towns, had been — at least in the unindustrialised south (Caird's low-wage districts) — a shade too fast, both for the good of the workers and for the advance of technology. [1] And rising living

[1] Collins (1969) shows that, to avoid raising the costs of poor relief and by reason both of their own social values and of the workers' opposition, farmers held back on the introduction of labour-saving harvest tools until the surplus of labourers had eased. In lowland Scotland, where both the poor law and social values differed, there was a much

standards for farm workers were to become more evident with the 'flight from the land' of the second half of the century, combined with the fall in food prices that set in in the 1870s.

More important, perhaps, is Simon's statement that 'the industrial revolution enabled communities for the first time to reduce the danger of mass starvation' (p. 146). There is much truth in this, especially if we adopt a long view. But perhaps he claims both too much and too little. In England 'There was famine at times in the north, and general dearths through the first half of the seventeenth century', but *not* thereafter. The immediate easing of the situation was probably the result of a population *decline* (Kussmaul, pp. 168, 173, 174). But its non-recurrence was due to a very considerable degree of trade; though the extent and date of the specialisation of agricultural production is debated, food (and other heavy commodities) were habitually moved considerably more than the fifteen kilometres that Simon attributes (p.146) to eighteenth-century France. Communications by both water and road antedated the 'industrial revolution' — after all some contemporaries saw Scottish occupation of Newcastle in 1640 and 1644 as an attempt to dictate terms by threatening to cut off the coal trade to London (Lipson, p. 114).

Unfortunately, though, the 'industrial revolution' was not a complete safeguard against famine, witness the experience of Ireland 1846-8. Perhaps the scale of events there was simply too great to be handled properly — the 'destitution' occasioned by a similar potato failure in the far less populous western Highlands and Islands of Scotland was relieved, if not without much suffering, at least without comparable disaster. Perhaps one should blame an incompetent and doctrinaire government, or even the belief that the potato crop could not fail in successive seasons. And it is fair to note that the failures of the end of the 1870s in the far west of Ireland came to be known, from the successful relief operations, as the 'Famine stayed by kindness'. But Irish population trends sit ill with Simon's thesis. For the first half of the nineteenth century they are debated in detail. It is clear, however, that the rapid population growth (6.8m. at the first census in 1821, 8.2m. in 1841) was more associated with the potato than with industrialisation. Ordinarily, indeed, potatoes and milk provided a good diet, better perhaps than the wheat bread of southern England; but when they failed ... After the Famine, the greater part of Ireland underwent a distinctive 'demographic transition' based on emigration, increased celibacy, and the postponement of marriage (Walsh (1970); Connell (1961-2); Cousens (1964-5); Schellekens (1993)). The effect was a steady fall in population that continued, in the Irish Republic, until 1961. It was accompanied

greater readiness to extrude the surplus rural population (though the effects of this were eased both by the extension of the area of cultivation and by the proximity of expanding industrial centres), to adopt machinery, and to concentrate on a smaller but more productive work force, supplemented by casual labour at peak seasons. (For a general history of English farmworkers, see Armstrong, 1988).

by rising living standards, but not by industrialisation — for which southern, though not north-eastern, Ireland was in the wrong place.

There was, therefore, even in Europe no necessary connection between population growth, prosperity, and industrialisation. Nor was the importance of geography confined to Ireland. In northern Scotland both the county and the city of Aberdeen prospered in the nineteenth century, economically as well as numerically. But the Isle of Lewis, though — or rather *because* — its population continued (untypically for such an area) to rise until 1911, was miserably poor, despite substantial development spending first by the principal landlord and then by the state; nor did even greater expenditure by Lord Leverhulme after 1918 mend things (Nicolson, pp. 42-3, 236-7; Dunbabin, pp. 208-9): Lewis was, in economic terms, in the wrong place.

Of course economics is not everything. By the later nineteenth century some people had come to see the preservation of a Gaelic crofting community as a good in itself. Moreover in earlier times, as Gladstone put it, 'the produce which' the Highland proprietors 'sought to raise from their land was not rent, but men' (Dunbabin, p. 264), land having been made available in return for military service (in some districts) as late as the Napoleonic wars. Warnings that the nineteenth-century promotion of sheep and thinning of population would result only in an army of Cheviot rams were a common theme of subsequent land agitation. But in the 1914-18 war 'One sixth of the entire population [of Lewis] served their country in some capacity, a higher proportion, it was said, than in any other part of the British Empire' (Nicolson, p. 46). That they could do so effectively, though, depended largely on industrialisation elsewhere in the United Kingdom.

Lastly China. This is not my specialism. But Dr. Simon and I do seem to have read different books. So it may be worth recalling some of Mark Elvin's contentions. Firstly he stresses the end of serfdom (following uprisings) in the later seventeenth and early eighteenth centuries, and goes so far as to claim that 'Chinese rural society in the nineteenth .. and early twentieth century was .. one of the most fluid in the world' (Elvin, p.255)[2]. He also doubts the low status of merchants on which Simon (pp. 153-4) insists, arguing instead that, as landlords moved their residences out of the countryside into the burgeoning market towns, something of a fusion took place. 'The sensible strategy, and the one that was most commonly followed in later traditional China, was to invest a modest proportion of one's capital in land, which would then serve as a safer reserve fund, but to look for profits elsewhere.' 'Power in the countryside no longer resided solely or even primarily in the ownership of land', but in 'trade, finance, education, and institutional position, in ascending order of importance'.

[2] 'The Communist land-reform documents of the 1930s again give proof of this. According to a .. party ruling, it took only three years to establish "landlord" or "rich peasant" status; and there are a number of references to the problems of dealing with those who had been landlords only for a short time' (Elvin, p. 258).

> By the beginning of the nineteenth century, if not earlier, many important merchants had acquired official titles both by examination and purchase. When, in 1826, the temporary blocking of the Grand Canal forced the Ch'ing government to transport .. [much] of its annual supply of rice by sea, it entrusted the task to forty-six merchants ..; .. twenty-six of them were provincial graduates, Imperial Academy students, senior licentiates or holders of purchased rank, in other words 'gentry'. Studying for the imperial examinations was expensive; and with the decline in large landholding in and after the seventeenth century, mercantile wealth must have been behind an increasing number of candidates. Any sharp dichotomy between «officials» and «merchants» is therefore misleading.
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> This was also a time when the political power of merchants was increasing. Its most obvious form was the confederations of guilds which became the municipal governments of a number of cities in the course of the nineteenth century. (Elvin, pp. 249, 267, 292 — cf. also instances of trade by officials, pp. 291-2)

Given all this, and given the amply demonstrated price-responsive nature of much agricultural and manufacturing production, extensive and long-distance trade over good water communications[3], and the availability of credit, the question arises of why there was no Chinese agricultural revolution. Elvin suggests a number of possible contributory factors[4]. But his primary explanation is over-population. The filling up of the previously undeveloped south had been 'the dynamic driving force behind an era of economic revolution' from the eighth to the thirteenth century. But this stimulus ended once it had 'raised the ratio of people to land, water and other resources to somewhere near the level of the older region'; 'after this time the expansion of acreage and improved practice only kept pace with population growth' (Elvin, pp. 113, 211-120). Through

[3] For China's massive cutting of canals in the early seventh century and its extensive use of water transport thereafter, see Elvin, pp. 58-9, chap. 10, and passim.

[4] Including: the proliferation in southern China of intestinal worms, as a result of the combination of irrigated rice agriculture and manuring with human excrement (p. 186); China's self-imposed isolation from the outside world (which would not have been possible had it not been united in a single political unit) (pp. 215-25); the absence of 'the seventeenth-century European mania for tinkering and improving' which 'could easily have made an efficient spinning machine out of the primitive model described by Wang Chen' (pp. 298, 195-9); the shift 'in the attitudes of philosophers towards nature' with 'Interest in systematic investigation .. short-circuited by a reliance on introspection and intuition' (pp. 204, 225-34); the possible lessening of economic stimuli as a result of the decline in huge cities *vis-a-vis* the diffusion of local market towns (p. 178); and the general separation, through the 'putting out system', of commerce from production such that 'those with the keenest awareness of market forces, and the capital and skills for new initiatives, ... were very unlikely to have any deep personal appreciation of how their product was manufactured and any ideas as to how it might be improved' (pp. 276-84).

> a number of interlocking causes, the input-output relationships of the late traditional economy had assumed a pattern that was almost incapable of change through internally-generated forces. Both in technological and investment terms, agricultural productivity per acre had nearly reached the limits of what was possible without industrial-scientific inputs, and the increase of the population had therefore steadily reduced the surplus product above what was needed for subsistence ... A falling surplus per head of population meant of course a reduction in effective demand .. for goods other than those needed for bare survival. Pre-modern water transport was close to a similar ceiling of efficiency; and few possibilities existed for increasing demand for goods by reducing transport costs.
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> ...With falling surplus in agriculture, and so falling per capita income and .. demand, with cheapening labour but increasingly expensive resources and capital, with farming[5] and transport technologies so good that no simple improvements could be made, rational strategy for peasant and merchant alike tended in the direction not so much of labour-saving machinery as of economizing on resources and fixed capital. Huge but nearly static markets created no bottlenecks in the production system that might have prompted creativity. When temporary shortages arose, mercantile versatility, based on cheap transport, was a faster and surer remedy than the contrivance of machines. This situation may be described as a 'high-level equilibrium trap' (Elvin, pp. 312-14).

This trap, Elvin concludes, could be broken in two ways, the acquisition from abroad, from the later nineteenth century onwards, of technology of a quite different order of sophistication plus (sometimes) simple imports that relieved strategic shortages of raw materials (Elvin, pp. 315-16), or by the acquisition of additional usable space. In this latter context, he cites the example of Chinese immigration into hitherto largely empty Manchuria (made possible by political change and the advent of railways). Its population doubled between 1905 and 1940; but the cultivated area more than doubled 1919-32, and agricultural production rose faster still. 'This agricultural transformation was accomplished almost entirely by late traditional techniques, ... and it proves that in the absence of severe resource constraints they were good enough to underpin an industrial revolution. Manchuria was industrialised under Japanese rule in the 1930s. The contrast with China Proper is impressive' (Elvin, p. 312).

There was some contemporary debate as to whether or not China was overpopulated, the usual feeling being that it was. An exception, Pao Shih-ch'en, voiced, in the early nineteenth century, a view quite like Dr. Simon's: 'If there are more people there will be more producers. A large population is the basis of wealth. How could it on the contrary cause poverty? There is not much unused land in the empire, but *productivity* does not conform to any such restraints' (Elvin, pp. 308-9). As Simon correctly observes, history is littered with mistaken forecasts that reserves will be exhausted by population or economic growth; instead, he maintains, 'impending shortages and other

[5] Chinese wheat yields per acre in the still unmodernised 1920s were appreciably higher than those in France in the late eighteenth century, though rather below the English yields of that time (Elvin, pp. 307-8). China's intensive rice cultivation had, of course, no north European parallels.

economic problems induce solutions that eventually leave the economy better off than if the shortage problems had not arisen' (Simon, pp. 149-50). Often, but not always. For I hope I have shown that population growth can be too fast and in the wrong place, relative to the economic opportunities, resources, and skills of any given period, and that the results can then be unfortunate. Constraints may well be lower today than in the past, since skills are more readily transferable and industry (let alone other economic activity) less confined to the close proximity of such nineteenth-century staples as coal and iron. But a mismatch between the location of people and of economic opportunities is still possible, both within and between countries; nor is there any question, for political, cultural and other reasons, of a simple flow of people from the 'wrong' to the 'right' places until economic equilibrium is reached. Furthermore, though it has been (and I suspect will long continue to be) the case that resource constraints can be transcended in advanced areas by higher technology, the assertion that this will necessarily be true for all time is as much a matter of faith as Malthus' contrary claim that population increases in geometric, subsistence only in arithmetical, ratio.

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