

A Review of Gregory Clark's *A Farewell to Alms: A Brief Economic History of the World*

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A Farewell to Alms advances striking claims about the economic history of the world. These include (1) the preindustrial world was in a Malthusian preventive check equilibrium, (2) living standards were unchanging and above subsistence for the last 100,000 years, (3) bad institutions were not the cause of economic backwardness, (4) successful economic growth was due to the spread of “middle class” values from the elite to the rest of society for “biological” reasons, (5) workers were the big gainers in the British Industrial Revolution, and (6) the absence of middle class values, for biological reasons, explains why most of the world is poor. The empirical support for these claims is examined, and all are questionable.

1. Introduction

Isaiah Berlin divided thinkers into two sorts—foxes and hedgehogs—following Archilochus's adage: “The fox knows many things, but the hedgehog one big thing.” Greg Clark is a hedgehog, and this will make him popular with those economists who proceed by first formulating a model and then fitting it to the world. His big idea is the macroeconomic distinction between Malthusian and Solovian phases of history. Clark narrates the story of the world in these terms, and, as subsidiary issues arise—e.g., why did England

have the first Industrial Revolution?—Clark proceeds in a similar a priori fashion. There is very little testing of Clark's theories: there is scarcely a regression in sight nor even a “horse race” in which they are matched against alternatives to see which can best explain what happened. Instead, information and anecdotes are assembled to show that the world exemplifies Clark's ideas. *A Farewell to Alms: A Brief Economic History of the World* (Princeton University Press, 2007) has a clear story line that makes for an engaging read. But is it true?

As befits an enthusiast for the forager life style, Clark is very good at hunting down remarkable facts and gathering unusual anecdotes. We learn how rapidly it took news of events in distant lands to reach England (pp. 306–07), how many calories were produced by an hour's work in different societies (p. 68),

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and even the intriguing fact that Malthus's family line died out because his children had none of their own (p. 81, n. 19). Nuts and berries from the forest are scattered throughout *A Farewell to Alms*.

In the preface, Clark (p. x) recognizes that he may not convince all of his colleagues in economic history, and in that he is correct. Most economic historians are foxes, and many will find the book unappetizing. They see the world as a complicated place and proceed inductively rather than deductively. Their models of inquiry are Baconian and positivistic: The accumulation of more evidence will eventually reveal the truth. Models can help to organize and guide the collection of information, but they are no substitute for research. Clark has done serious work along these lines—mainly the collection of prices and incomes that we will discuss later—but he is also too dismissive of much historical scholarship. He distinguishes his book from “the usual dreary academic sins, which now seem to dominate so much writing in the humanities.” Whereas most historians see themselves collecting information to create an increasingly accurate description of the past, Clark sees their work as “willful obfuscation and jargon-laden vacuity” (p. x). In its place, Clark offers us the big picture. But is he “leading us to the light” as he hopes, or is he offering what Berlin calls the hedgehog’s typically “fanatical, inner vision”?

We should not judge a book by its cover and probably not by its title either, for, in this case, it is inaccurate. The aim of the book is to explain why some countries are rich and others are poor. The West (including Japan) has achieved mass prosperity, but the rest have yet to bid a “farewell to alms.” Indeed, in Clark’s view, their prospects are bleak. Why have some countries succeeded? Is pessimism about the rest warranted? These are big questions and Clark offers answers that are often original. Whether they are important insights or novel eccentricities depends

on whether his theories accord with the facts. Clark supports his argument with his own brand of casual empiricism with little reference to the findings of other scholars who are often more careful, comprehensive, and methodologically sophisticated. The question that animates this review is whether Clark’s theories stand up in the light of that research.

This review is organized around the major propositions of *A Farewell to Alms*. They are:

- The preindustrial world was Malthusian, and demography kept income per head constant for 100,000 years.
- Bad institutions do *not* explain the absence of economic growth. On the contrary, the institutions of medieval England were almost perfect for growth.
- Rather, the lack of growth in the preindustrial world was due to bad culture, to a lack of the “middle class” virtues of hard work and thrift.
- The Industrial Revolution happened in England because the middle class virtues spread down the social scale there in the sixteenth and seventeenth centuries for biological reasons. The poor did not have enough surviving children to reproduce themselves, while the rich had a surplus with the result that children of the rich were forced down the social scale. The middle class virtues went with them since they were—quite possibly—carried in their genes. This mechanism did not operate in other countries since the rich and the poor had similar numbers of surviving children.
- Income grew slowly during the Industrial Revolution and workers rather than capitalists or landowners were the main beneficiaries.
- The Industrial Revolution ought to have spread quickly around the world since modern machinery could be imported, and low wages should have given

businesses in poor countries a competitive edge. However, for biological reasons, workers in Asia, Africa, and Latin America lacked middle class values. As a result, the competitive advantage was frittered away in high manning levels, and poor countries stayed poor.

2. *Was the Preindustrial World Malthusian?*

Clark divides world history into two phases: The first was a Malthusian phase. “The same [Malthusian] economic model applies to all societies before 1800” (p. 30). The second was the subsequent period of sustained economic growth. This division is supported by the striking graph of the real wage in England from 1200 to the present. The curve looks like a right angle: It is horizontal from 1200 to the early nineteenth century when it turns almost vertical rising by a factor of ten in the last 150 years. According to Clark, Malthusian dynamics explain the stasis from 1200 to 1800. But do they really?²

While it is widely believed that the preindustrial world was Malthusian, the view is controversial among economic historians. Part of the trouble is that Malthus proposed two versions of his model, which makes it difficult to reject “Malthusianism.” In both versions, the wage in the long run was determined by equating fertility and mortality, which were both regarded as functions of the real wage. In the first and simplest “positive” check version, the mortality rate was a declining function of the wage, while fertility was at its maximum and independent of the wage. The wage that equated fertility and mortality was the “bare bones” subsistence wage. The only difference between this and the “preventive check” version of the model is that the fertility rate in the latter is initially a rising function of the wage and increases until it reaches its maximum value where it remains as the wage rises further. The rising

portion of the fertility function represents the behavior of people who defer marriage when incomes are low. If the curves in the two versions were otherwise the same, the preventive check allows an equilibrium wage that is higher than “bare bones” subsistence and reflects cultural patterns related to marriage. Malthus took this possibility very seriously. He believed that wages in China and India, for instance, were lower than in England, and he attributed the difference to differences in marriage behavior. In England, he believed all social strata delayed or postponed marriage when economic conditions were difficult—hence the upward slope in the fertility function—while he believed marriage was universal in Asia, so fertility was at its maximum. In Malthus’s view, England equilibrated at a “cultural subsistence” wage that exceeded “barebones” subsistence.

The history of real wages is broadly in accord with Malthus’s views. To explore this question, I have deflated the real annual earnings of laborers with the cost of a “bare bones subsistence” basket for a family, representing the minimum cost of survival in different parts of the world.¹ Diets are specified to provide a man with 1940 calories per day (and other family members accordingly) using the cheapest available carbohydrate. For northwestern Europe, that was oatmeal; for Florence, it was polenta; for Delhi, it was millet chapatis; for Beijing, it was sorghum. Peas or beans are included as well as minimal allowances for meat or fish, butter or oil, cloth, fuel, and rent. When full-time, full-year earnings for the man equal the annual cost of this basket, the family exists at subsistence. Figure 1 shows the ratio of full year,

¹ Clark presents some international comparisons deflating wages by the price of wheat, but these can be misleading since even the poorest people consumed other goods and wheat represented different food qualities in different places (it was cheaper than rice in the Yangzi Delta (Li 1998), but the most expensive grain in England).

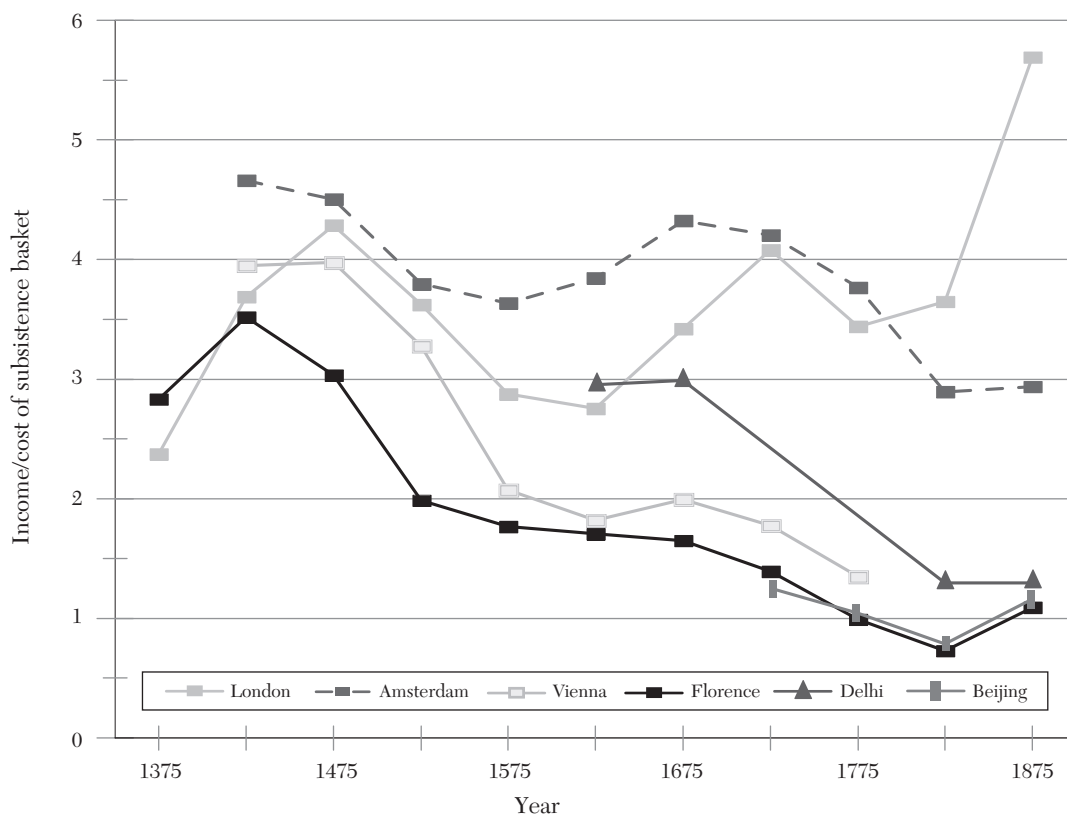


Figure 1. Subsistence Ratio For Laborers

full time earnings to subsistence costs for an unskilled laborer in six cities in Europe and Asia (Allen, Bassino, Ma, Moll-Murata, and van Zanden 2007). In all places, real wages were high in the fifteenth century, for the Black Death had cut the population everywhere. As the population rebounded, wages fell in most of the world and dropped to bare bones subsistence in the eighteenth century. The leading cities of northwestern Europe, however, maintained much higher levels of real wages. Workers in the countryside had lower wages than their counterparts in London and rural wages showed a bigger drop in the sixteenth century. However, earnings in southern England rebounded in the

seventeenth century and were always above bare bones subsistence. High incomes are a major reason that famines disappeared from England by the early seventeenth century.

How can we explain figure 1? Malthus would see it as confirmation of his belief that the preventive check was common in northwestern Europe and the positive check was the norm elsewhere. Malthus' view finds some support in the history of family structure. The preventive check is usually associated with what Hajnal (1965) called the [west] European marriage pattern. In the early twentieth century, 10–20 percent of women never married and those who did delayed marriage until their late twenties. These

proportions responded to changes in the real wage, generating the preventive check. Outside of northwestern Europe, all women married and at a very young age, so fertility was higher and independent of income. The positive check, therefore, prevailed in Eastern Europe and Asia. Not only was the preventive check limited geographically, it was limited temporally. In a paper evocatively entitled "Girl Power," De Moor and van Zanden (2005) argue that it only appeared in the fifteenth century in northwestern Europe. Catholic ideology was emphasizing the importance of individual choice in marriage (rather than arranged marriages). What gave these ideas force were the high wages of the post Black Death period, which allowed women to refuse marriage unless the terms were favorable. As a result, marriages were deferred until men inherited the property to guarantee a high income. The preventive check was born. It only lasted a few hundred years, however. The population growth of the mid-eighteenth century was precipitated by a sharp fall in the average age of women at first marriage (Goldstone 1986). This was not due to rising wages; rather, it was due to the growth of manufacturing employment, which allowed young people to establish viable households without having to inherit property. The preventive check, in other words, reverted to the positive check. Under this interpretation, the Malthusian preventive check probably operated for only a few hundred years.

Clark, in contrast, believes that the preventive check was always operative in all societies. Instead, Clark sees the international real wage divergence in figure 1 as an equilibrium phenomenon due to the rapid urbanization of England and the Low Countries in the early modern period. The population of London did, indeed, increase from fifty thousand in 1500 to one million in 1800, and the Dutch cities grew similarly. Since early modern cities were death traps, the mortality

rates in England and the Netherlands were exogenously higher than elsewhere, so wages had to be higher to equate births and deaths. This argument is unconvincing, however. While England and the Netherlands were more urbanized than France or Germany, Italy and Spain had large urban populations (a legacy from their medieval economic lead), so differences in urbanization cannot explain the wage divergence between the winners and the losers in the early modern economy. In fact, the growth of the maritime cities of northwestern Europe was so rapid and depended on such high rates of rural-urban migration, that there was a persistent wage premium over the countryside that was not depressed by population expansion (Allen 2001, 2003; Broadberry and Gupta 2006).

Another approach to testing Malthus is to examine the determinants of fertility and mortality. Wrigley and Schofield's (1981) reconstruction of English population history from 1541 onwards provides annual time series of marriages, births, and deaths, and these can be correlated with time series of real wages and grain prices. Tests have also been conducted for France and other countries, but the data are inferior (Weir 1984). The usual finding is that low incomes increased mortality and cut fertility in accord with Malthus's views. These tests reveal short run responses.

Other tests estimate structural versions of the Malthusian model with more complicated response functions. These models reveal long-run equilibrating behavior, and the findings are much less kind to Malthus's views. In general, there is no evidence of a positive check and only weak and limited evidence of a preventive check. Ronald Lee (1980, pp. 541, 547), for instance, concluded a generation ago that "wages account for only about 15 percent of the variance in [population] growth rates, so that most of the variation is exogenous." Lee firmly rejected the Malthusian model: "There is a notion that social mechanisms cause

population to grow and decline in response to changes in productive capacity, in such a way as to keep incomes close to a culturally defined standard of well-being. And some who reject this model as descriptive of the present still believe it is appropriate for the past. In fact it is a poor description of both.” Lee and Anderson (2002) have revisited the question using state space methods and came to similar conclusions. “Very little of the long-term variation in either fertility or mortality appears to be explained by variations in wages” (Lee and Anderson 2002, p. 213). Instead, vital rates moved exogenously. The limited feedback from the wage to population means that the half-life of response to shocks was over one century.² “Even though fertility, mortality, and wages were all endogenous in a Malthusian system, each nonetheless moved with sufficient independence that it could exert a strong exogenous causal force on the others, even over periods measured in centuries” (Lee and Anderson 2002, p. 216). These results are broadly confirmed by Crafts and Mills (2008). They find some evidence for a preventive check between 1541 and 1640 but none thereafter and no evidence for a positive check. Their analysis confirms that exogenous shocks were the main determinant of population change.

For most of the twentieth century, the demography and economy of the Middle Ages were interpreted in a Malthusian framework (Hatcher 1977; Hatcher and Bailey 2001). Campbell (forthcoming) has recently criticized this approach with arguments that parallel the view of Lee and Anderson. Campbell, for instance, denies that there was feedback from the wage rate to population. He contends that it evolved exogenously, and he has linked mortality crises like the Black Death to weather fluctuations revealed by

Greenland ice cores rather than to “overpopulation.” A particular puzzle for medievalists is why the high real wages of the fifteenth century did not cause the population to rebound as Malthus would have expected. The answer is that it was driven by exogenous shocks.

These investigations of the Malthusian model have important implications for the explanation of wage history. If feedback from the wage had little to do with fertility and mortality, which moved exogenously, then the lack of trend in the English real wage before 1800 was not due to Malthusian checks. Instead, it was the result of exogenous mortality and fertility shocks. Clark’s graph does not prove that the world was Malthusian.

3. *Malthus in the Very Long Run*

Lee and Anderson’s (2002) finding that feed back from the wage to population growth was too limited and slow to explain wage behaviour in the early modern period leaves open the possibility that Malthusian checks could have mattered over many thousands of years. Indeed, the Malthusian model is important to Clark, for it rationalizes two of his bolder claims—namely that there was no improvement in the standard of living for 100,000 years before the Industrial Revolution and, second, that “most societies before 1800 . . . lived well above the bare subsistence limit” since they all restrained fertility, i.e., the preventive check applied. Alas, Clark has absolutely no evidence about the standard of living that far in the past; some “evidence” runs back 5,000 years to ancient Egypt and Mesopotamia, and Clark references Mesolithic skeletal remains that could be as much as 13,000 years old (p. 59). He fills in the missing “87,000 years” on the assumption that modern foragers enjoy the same standard of living as our ancient ancestors. How true is that? I concentrate on the period since the last ice age, for which there is at least some evidence.

² Temin (2008) has recently reinterpreted Roman economic history with a Malthusian model incorporating very slow feed back from the wage to the population.

Standard of living has several dimensions of which food consumption is an important one. Clark uses adult male height to make conjectures about it. The rationale is that genes influence an individual's height, but the mean heights of populations reflect the balance of food intake and nutritional requirements during childhood rather than genetics. Adult height can, therefore, be used as a proxy for the level of nutrition of people who are poor enough to have a very high income elasticity of demand for food.³ Clark's concentration on men is a limitation since female heights were often a more sensitive indicator of deprivation. Anthropologists discuss many other features of skeletons as well, and they paint a different picture of well-being from height (Steckel and Rose 2002).

Clark's view about human living standards over the long term is based on a comparison between modern foragers and eighteenth century Britains. "The median of the [male] heights of these forager societies is 165 centimeters" (p. 59). He reports figures for Britain of 169 and 170 centimeters (pp. 57, 61), although Cinnirella's (forthcoming) recent reworking of Floud, Wachter, and Gregory's (1990) data push the mean height in the mid-eighteenth century up to 172 cm. What do five (or seven) centimetres mean? As a rough guide, a mean height of 160 centimeters is "short" with few societies having a lower mean height for men. Indeed, 160 centimeters is characteristic of a bare bones subsistence wage like eighteenth century China or Italy in figure 1 (A'Hearn 2003; Clark 2007a). In contrast, 170 centimeters was "tall" by the standards of the nineteenth century and was attained in societies where the laborer's wage was three to four times

bare bones subsistence. On this reading, Clark's summary of the height data actually indicates that British living standards before the Industrial Revolution were superior to those in modern forager societies.

What about forager societies in the past? Any discussion of this issue must address one of the great questions in archaeology, namely, the impact of the invention of agriculture on the standard of living. "Common sense" suggests that agriculture raised the standard of living, but much evidence now indicates that the standard of living fell when farming spread. In a review of the literature, Larsen (1995) concluded that "the shift from foraging to farming led to a reduction in health status and well-being, an increase in physiological stress, [and] a decline in nutrition" (p. 204). The deterioration is apparent in a variety of skeletal indicators. Farmers had more dental cavities, more lost teeth, slower growing children, and smaller bones. In many settings, farmers were shorter than foragers, but in some there was no difference in height. The only mesolithic and neolithic heights that Clark (2007a, p. 61) reports are for Europe which is an unusual region in that farming did not reduce height (Cohen and Armelagos 1984). More recently, the negative impact of agriculture on health was confirmed by Steckel and Rose (2002) in their encyclopaedic review of skeletal evidence for the Americas. Clark seems unfazed by this evidence. On the one hand, he acknowledges that "living standards . . . did decline after the spread of agriculture," but he thinks the declines were uneven and "modest." His final assessment is equivocal: "The effect of settled agriculture on living standards in a Malthusian world is inherently ambiguous" (p. 37).

Clark's equivocation follows from his faith in the Malthusian model. He believes that "the birth rates of forager and settled agrarian societies were likely the same, and death rates at a given income differed little" (p. 37).

³ Deaton (2007) presents modern evidence that there is no stable, direct relationship between income and height. The lack of correlation between different indicators of health derived from skeletons raises the same question. If Deaton's critique is accepted, then Clark's claims about long run living standards become untestable.

TABLE 1
ENGLAND IN 1688

People	Income	Income percent of population	Per head	Relative to subsistence
Landed classes	200,358	3.5%	£46.4	23.2
Bourgeoisie	262,704	4.6	40.2	20.1
Commercial	1,190,552	20.9	9.0	4.5
Farmers	1,023,480	18.0	10.4	5.2
Workers	1,970,895	34.7	5.6	2.8
Cottagers, poor	1,041,344	18.3	2.0	1.0
Total/average	5,689,322		9.6	4.8

Notes: Subsistence income is taken to be £2 per head. A direct calculation of the bare bones subsistence income of an adult man using 1680s prices is £2.07. Women and children could survive on a somewhat lower amount, and that refinement is not included here.

Landed classes includes the various lords, gentlemen, clergy, and practitioners of sciences and arts.

Bourgeoisie includes merchants, office holders, lawyers, the artisans with incomes of £200 per year, and the naval and military officers.

Commercial includes shopkeepers, tradesmen, and manufacturers.

Farmers includes farmers and freeholders.

Workers includes laborers, the building trades, miners, domestic servants, common seamen and soldiers.

Cottagers, poor includes cottagers, paupers, and vagrants.

Sources: Lindert and Williamson (1982). I have altered the figures in one way: When King reported a household with more than 4.5 people, I assume the excess were servants and tally them among the workers. I also assign £9 income to each servant and deduct it from the income of the person they worked for. This is along the lines of calculations made by Lindert on his website.

From this, he infers that incomes had to be constant. Clark's assumptions, however, are at odds with anthropological and archaeological evidence, in particular, birth rates were likely higher amongst farmers than amongst foragers. "A fertility-based argument for population increase is consistent with the generally greater fertility seen in agriculturalists as opposed to nonagriculturalists in ethnographic settings, albeit with a high degree of heterogeneity" (Larsen 1995, p. 197). This presumption is supported archaeologically: "skeletal series of agriculturalists show lower mean age-at-death than do hunter-gatherers" (Larsen 1995, p. 197). At first blush, this might suggest that the expectation of life was lower for farmers, but, in fact, mean age at death is determined by fertility: Populations with higher fertility have a greater proportion

of young people and their deaths lowered the overall average age at death for the population as a whole (Johansson and Horowitz 1986).

Skeletal evidence, therefore, indicates that farmers had higher fertility than foragers. This is not surprising: farming was sedentary, and permanent settlement meant that mothers no longer had to carry their babies and young children as bands wandered in search of food. The cost of children fell, and their number rose in consequence. If mortality was a declining function of consumption in the neolithic, then an exogenous increase in fertility would have driven down living standards in a Malthusian framework.

In many places, the postneolithic rise in inequality and the fall in average living standards led to very poor nutrition and very

short people. In Tikal, a major Mayan centre, for instance, high status men averaged 170 centimetres in the early classical period around 300 AD, while low status men were 162 cm. By the late classical period around 800 AD, the high status men were only 164 cm. tall, while the low status men were 157 cm. (Bogin and Keep 1998). Societies like the Tikal contradict Clark's belief that all preindustrial peoples were living at similar standards of living that were "well above the bare subsistence limit" (p. 6).

In comparison with Tikal, Englishmen in the early eighteenth century with a mean height over 170 cm. were very tall and prosperous. This conclusion is strengthened when we recognize that the English height is estimated from military recruiting records, and the military was drawn overwhelmingly from the bottom rungs of society. Most recruits were laborers, miners, building workers, and domestic servants. Table 1, which is derived from Gregory King's famous social table of England in 1688, gives some idea of how they fit into society.⁴ The poorest group were the cottagers, paupers, and vagrants to whom King assigned an income of £2 per person per year. As it happens, the bare bones subsistence basket used in figure 1 cost just over £2 per year for a single man in 1688, so people at the bottom of table 1 really were at subsistence. Clark is probably right that they were living no better than poor people millenia earlier. But cottagers, paupers, and vagrants

only comprised 18 percent of English society, and the better off 82 percent were much more prosperous. The workers (including manufacturing and agricultural laborers, building craftsmen, miners, soldiers, sailors, and domestic servants) earned almost three times subsistence, and they were the predominant source of army recruits. 47 percent of the population were in groups with even higher average incomes. The highest strata—the landed classes and the bourgeoisie—had average incomes twenty times greater than subsistence.⁵ They only comprised 8 percent of the population, however. The shopkeepers, manufacturers, and farmers (39 percent of the population) earned five times subsistence. The average income was also almost five times subsistence and almost twice the income of laborers

Clark's view of preindustrial England is oversimplified. In contrast to table 1, he imagines a bipolar world of very rich and very poor. "The riches of a few dwarfed the pinched allocations of the masses . . . The Darcys were few, the poor plentiful" (p. 2). This vision ignores the importance of human capital in the preindustrial world and therefore misses the prosperity of the middle strata of preindustrial England. Ignoring the middle strata means overlooking much of the gain from the economic growth. The prosperity of the middle strata was due to an extensive division of labor within and between firms and to a high endowment of craft skills on which preindustrial technology depended. Human capital was essential to economic growth in the preindustrial era just as it became later.

The high standard of living in preindustrial England was manifest in other features of the economy. Heights tell us primarily about food consumption during childhood,

⁴ Lindert and Williamson (1982) revised the occupational distribution and the income levels in light of evidence not available to King, and their revisions are used here. I have made one further revision: King counted servants as family members (e.g., temporal lords had an average family size of forty and an average annual income of £6060). I separated the servants on the assumption that families had 4.5 natural members (so each temporal lord employed 35.5 servants) and assigned the servants to working class with an income of £9 per year. The number of people in the temporal lords category was reduced accordingly and the income of a lord was lowered to £5750.5 per year. This revision is along the lines of calculations made by Lindert on his website.

⁵ This figure excludes the value of their servants, who are tallied as workers and whose income has been deducted from that of their employers.

but manufactured goods were another aspect of living standards. The “consumer revolution” is an important theme in early modern social history, and it points to the emergence of a mass market for imported manufactures (Chinese porcelain, Indian calicoes) and European produced goods ranging from books to mirrors to crockery to watches (Shammas 1990; McKendrick, Brewer, and Plumb 1982; de Vries 1993; Fairchilds 1993; Weatherill 1996; Berg and Clifford 1999; Berg 2005). There was a middle class market for these goods, but even the working class consumed them. People living millenia ago did not, and their standard of living must be down graded accordingly.

Leisure is another aspect of the standard of living. Clark perceives that the forager life style was superior to that of early modern Europeans in that the hunters and gatherers worked fewer hours per year. Our best information about work intensity in the mesolithic and neolithic is skeletal since prolonged physical activity is manifest in arthritis, degeneration of joints, the dimensions of bones, and the size of muscle attachments. This evidence shows either no difference between foragers and agriculturalists or indicates that the former led more demanding physical lives. For instance, “comparisons between hunter-gatherer and farming populations from archaeological settings indicate a pattern of decrease in the dimensions of long-bone shafts and muscle attachment sites, which presumably reflects a decline in physical demand and work load following sedentism” (Larson 1995, p. 201). As with other issues, Clark confines his comparisons to men. This focus misses much of the impact of agriculture on workloads since farming significantly increased the workloads of women, while it redirected the work of men from hunting to cultivation without affecting the total activity as much.

Even if it were true that foragers worked less, why they worked less is important in

assessing the welfare implications. Less work may simply represent the absence of technologies to produce manufactured goods. Thus, the obverse of the consumer revolution was the “industrious revolution”: in the seventeenth and eighteenth centuries, people willingly worked more hours per year to earn the money to buy the newly available consumer goods (de Vries 1994). This behavior reveals that the consumption of manufactures was worth more to people than the leisure of primitive society, and their welfare was higher in the seventeenth century than it had been earlier.

Contrary to Clark, our forebearers were not enjoying abundance in a Garden of Eden. Economic growth before the Industrial Revolution was not rapid, but it did generate a higher standard of living for most people than that enjoyed by ancient foragers or early farmers. It is hard to believe that Moll Flanders would have willingly traded places with a cave woman. These gains were not swamped by Malthusian forces.

4. *Do Institutions Explain Economic Growth?*

Many economists now believe efficient institutions promote economic growth. Well-defined property rights, freedom from expropriation, unimpeded markets, and minimal government are a common recipe for success (Greif 2006; Menard and Shirley 2005; Acemoglu, Johnson, and Robinson 2005). Against the mainstream, Clark rejects institutions as an explanation of economic growth.

Clark tackles the role of institutions in several parts of *Farewell to Alms*. He is enthusiastic about the argument that inefficient institutions cannot persist for long since everyone could gain from reforming them. Slavery and serfdom are his examples: if these institutions were inefficient then the slaves and serfs should have been able to buy out their masters. Institutionalists would

respond (according to Clark) that a deal would be impractical, for the former slave owners could not collect their 'emancipation payments' after abolition. Only a forceful change in property rights would end serfdom or slavery.⁶ Clark's riposte to this is that slavery in the Roman empire and serfdom in medieval England, in fact, disappeared without a social struggle. So history shows that institutions respond to market forces and do not constrain them. Hence, according to Clark, bad institutions cannot explain poor economic performance.

The trouble with Clark's riposte is that his counterexamples do not make his point. Slavery in the Roman empire "ended" in the second century. Previously, it had been a brutal system of extreme work, draconian punishments, and no family life. The slave population was replenished by captives from the provinces newly annexed to the Empire. When the Empire stopped expanding after 116 AD, the supply of new slaves dried up, their price rose, and estates were reorganized so that slaves would form families and breed more slaves. These were the *servi casati*, and their organization was much like that of medieval serfs. At the same time the conditions of slaves were improved, formerly free peasants were tied to the land in similar arrangements. The end of Roman slavery was the beginning of serfdom—not freedom. The change was an income-raising reorganization on the part of slave owners and not an indication that slavery would evolve an arrangement for negotiating mutually beneficial improvements (Jones 1956; Anderson 1974).

English serfdom looks more promising for Clark, for it did disappear between 1350 and

1500. Mutually beneficial exchange was not a major element, however. The precipitating event was the Black Death of 1348–49, which produced labor shortages.

Draconian legislation was introduced to prevent wages from rising, and it had some effect for a generation. Clark says that serfdom ended "without any emancipation movement," but the French peasantry revolted in the Jacquerie of 1358 and the English peasantry in 1381. Indeed, differences in the resolution of rural class conflicts have been influential in explaining differences in economic development across Eurasia (Brenner 1976, 1989; Brenner and Isett 2002). The English revolt ended attempts to suppress wages and prevent labor mobility. Thereafter, peasants moved to new farms on different estates where the landowners were desperate for tenants and accepted the run-away serfs as free people. Where lists can be compared, it is remarkable that the surnames in English villages differed considerably in 1500 from what they had been a century and a half earlier. Labor scarcity led to labor turnover and that ended serfdom. Population turnover, however, was not the same as renegotiation of social institutions (Allen 1992; Hatcher and Bailey 2001).

Indeed, medieval England is Clark's main counterargument to the institutionalists, for he argues that it had first-rate institutions and yet did not achieve modern economic growth. He defines good institutions in terms of his reading of the Washington consensus. These institutions include, for instance, low taxes, and indeed, the English crown taxed only a tiny fraction of English GDP. Secure property rights were another important institution, and Clark claims that Henry II's legal reforms created a modern system of property rights. Since medieval England had such good institutions and did not grow, Clark concludes that institutions do not explain growth.

The argument is breathtaking, but immediately raises doubts. First, accepting for

⁶ The efficiency and viability of slavery has been a central question in American economic history, e.g., Phillips (1918, 1929), Conrad and Meyer (1958), Yasuba (1971), Sutch (1965), Fogel and Engerman (1974), David et al. (1976).

the moment Clark's assessment of medieval institutions, the most that the argument establishes is that good institutions were not sufficient for economic growth. The argument does not show they were unnecessary. Historians have pointed to many later developments—the Reformation, the Scientific Revolution, the rise of a global economy—as contributing to the Industrial Revolution. Their impact may have required “good institutions” and their absence during the Middle Ages may explain why the “good” medieval institutions did not cause growth.

Second, Clark is highly selective in his assessment of medieval institutions. He claims that medieval England “would rank much higher than all modern high-income economies” if it is scored “using the criteria typically applied by the International Monetary Fund and the World Bank” (p. 147). He lists a dozen criteria emphasizing low taxes, stable money, secure property rights, and free markets and concludes that medieval England is unsurpassable in all respects except, perhaps, for the absence of a patent system.

Many of Clark's scorings are unconvincing, however. He argues that property was secure is simply because of “the modest fluctuation in property values over time.” Presumably this is freehold property and not the land held in serfdom by much of the population. Their property rights were far from secure. The argument that taxes were low only considers royal tax collections and ignores the income taken by lords from their peasants. Since the lords performed public functions (the army consisted of knights, for instance), their income cannot be ignored in assessing the burden of the state. Adding aristocratic to royal income would produce a hefty tax rate. Curiously, Clark contends that personal security was high despite showing that murder rates were at least ten times greater than today (p. 126). The high medieval homicide rates were “not,” however, “such that they

would interfere with the operation of economic incentives” (p. 160).

Clark's optimism is only possible because he ignores serfdom in his scoring of medieval institutions. For most of the Middle Ages, a majority of the English were serfs and held land in villeinage (servile tenure). While the free population could defend its ownership of land in the royal common law courts, the serfs could only litigate in the thousands of manorial courts presided over by their lords. They had no recourse to royal courts if the lords violated their rights. They could also not secure public protection for their persons against violence by their lords. They were subject to a variety of assessments that reduced economic incentives. Why improve the quality of your livestock when the lord could take the best animal when the holding was inherited? Land could not be conveyed without arbitrary fines being levied on the transaction. These controls produced a markedly more egalitarian distribution of land holding than obtained among freehold property not controlled by the lords. Labor mobility was inhibited since a serf could not leave the estate without permission and that was not lightly given since a distant serf could disappear. The claim that taxation was low and did not impede economic incentives is belied by the ability of lords to impose arbitrary assessments on their peasants. Tallage is a case in point. Initially, it was an assessment levied for special purposes—to ransom the lord, for instance, if he were captured on crusade. Tallage was such a convenient and elastic revenue source, however, that it became routine. It is hard to believe that these arrangements did not check the growth of the medieval economy.

Third, Clark's list of “economic desiderata” (p. 148) is not an adequate analysis of good institutions (Stiglitz 2002). States made many contributions—some intentionally, others not—to economic development (Chang 2002; Reinert 2007). In the eighteenth century, the

British state created an empire, which sustained the demand for British manufacturing and provided capital to finance it, provided canals and turnpikes, and operated a system of poor relief that improved that underpinned an industrial labor force (Inikori 2002; Solar 1995; O'Brien 2005). In the nineteenth century, governments in Europe and North America built infrastructure, created mass education, and enacted tariffs that promoted economic development (O'Rourke 1995). Japan developed through the wholesale modernization of its institutions after the Meiji restoration. The gaps between these initiatives and medieval England is immense.

5. *Did Natural Selection Give the British Bourgeois Values?*

If institutions do not explain economic growth, what does? Clark's answer is character—"the emergence of modern man" (p. 166). The Industrial Revolution "was the product of the gradual progress of settled agrarian societies toward a more rational, economically oriented mindset" (p. 231). England was the preeminent example of these societies that were "becoming increasingly *middle class* in their orientations. Thrift, prudence, negotiation, and hard work were becoming values for communities that previously had been spendthrift, impulsive, violent, and leisure loving" (p. 166). The change in character was manifest in lower interest rates, greater literacy and numeracy, a longer work year, and less violence (although the importance of the later is unclear given Clark's earlier judgement that medieval levels of violence were not high enough to reduce economic incentives).

Why was England becoming more middle class? "A plausible source of this apparent evolution of human preferences is the survival of the richest that is evident in preindustrial England" (p. 167). The poor had too few surviving children to reproduce

themselves. The rich, on the other hand, had more than enough. "Given the static nature of the Malthusian economy, the superabundant children of the rich had to, on average, move down the social hierarchy in order to find work" (p. 7). Downward social mobility spread the values of "patience, hard work, ingenuity, innovativeness, [and] education" throughout society. The difference between the rich and poor in the number of surviving children was more marked in England than elsewhere, and that explains why England took the lead in economic growth.

This argument raises many issues. The first thing to notice is that it confounds two kinds of changes. One is behavioral: the fall in the interest rate and the rise in literacy, for instance. The other is attitudinal: thrift, prudence, etc. The change in attitude could in principle explain the change in behavior, but there are many other candidates for that. Before accepting Clark's claim that the change in attitude caused the change in behavior, other explanations for the behavior changes need to be considered.

There are well established alternative explanations for the behavioral changes. Consider literacy. The invention of the printing press cut the price of books, which would have induced a rise in literacy whatever the preferences (van Zanden 2005). In addition, the demand for literacy was always higher in towns than in the countryside. In Venice and Florence, for instance, about one third of the men were literate during the Renaissance (Grendler 1989), while only 2 percent of the peasants in Poland could read (Wyczanski 1974). In England, the proportion of people living in towns greater than 5,000 rose from 7 percent in 1500 to 29 percent in 1800 (Allen 2000), and the demand for literacy rose with it. Similar considerations undoubtedly applied to numeracy. Likewise, there are institutional explanations for the fall in interest rates. It is important that England lagged behind the continent in the decline

in interest rates, which dropped from 20 percent to 6 percent in continental monarchies in the fifteenth and sixteenth centuries. The corresponding drop did not occur in England only the beginning of the eighteenth (Epstein 2000). The usual explanation for the fall is the development of modern credit instruments and markets for them. The credit revolution was initiated by continental governments who had to finance land warfare, which was very expensive. Britain, being an island, was relatively isolated from European geopolitics and faced different military challenges, so financial institutions remained underdeveloped. It was only when Parliament invited William and Mary to assume the throne in 1689 that the situation changed. William had been Prince of Orange and Stadtholder of most of the Dutch republics, and they brought with them modern continental financial institutions as well as involvement in European wars. The Bank of England was created, for instance, as well as a funded public debt which occasioned the emergence of credit markets. Interest rates then fell in England (Neal 1990).

The spread of “middle class” values can also be seen as the result of broader social changes. One approach imputes the new attitude to changes in the realm of ideas. In Weber's (1930) thesis, the Reformation famously led to the Protestant Ethic and, thence, to the Spirit of Capitalism (Rublack 2005). Recent economists who trace modern attitudes to some earlier change in the realm of ideas include Mokyr (2002) who argues there was a new and rational approach to the study of technology of the eighteenth century and traces this to the Enlightenment and, ultimately, to the Scientific Revolution of the seventeenth century.

Another approach to explaining the rise of “modern man” is to see his emergence as a result of changes in the economy of the early modern period. This theme has been popular with liberal as well as Marxist think-

ers. I have already observed that the rise in literacy and numeracy, for instance, can be attributed to the demand for these skills generated by commercial life and hence their spread can be attributed to the growth of towns and cities. The same is true of the attitudes that Clark associates with modernity, for they contributed to success in the same setting. As John Stuart Mill (1840) observed, “The spirit of commerce and industry is one of the greatest instruments not only of civilization in the narrowest, but of improvement and culture in the widest sense: to it, or to its consequence, we owe nearly all that advantageously distinguishes the present period from the Middle Ages” (p. 48). These advantages include the middle class values that Clark champions.

With these alternative contending explanations in the air, Clark's claim that “modern man” was the product of a biologically based shift in preferences cannot be accepted without more justification than he offers. Indeed, formidable justification would be necessary since key propositions of the argument are false. These include the following:

- The rich in the later Middle Ages exemplified middle class values.
- The poor in the later Middle Ages did not exemplify middle class values.
- By the eighteenth century, the poor had come to exemplify middle class values.
- The rich passed their values on to their children either genetically or by upbringing.
- The rich had more surviving children than the poor.
- England was unusual in this regard.

Consider them in turn:

The rich in the later Middle Ages exemplified middle class values.

This is very doubtful. The economic management of aristocratic estates differed from

orthodox capitalist practice. Land was divided among customary tenants, for instance, in equal size holdings that did not maximize the value of land. Hilton (1962) measured savings rates for English medieval estates and found them to be less than 5 percent. “The *idea* of re-investing profit for the purpose of increasing production seems to have been present in few minds if any. In *practice* the minimum rather than the maximum seems to have been spent on those goods which go towards capital formation” (Hilton 1962, p. 67) Instead of being good business managers, the English knights were the most rapacious warriors in Europe. The English outfought the French for most of the Hundred Year’s War (1337–1453). When the English knights were finally defeated, they turned on each other in the Wars of the Roses (1455–89). The English aristocracy in the Middle Ages were not thrifty, proto-businessmen.

Most English historians have a view different from Clark about the relationship between the upper classes and the rest of society. The essential idea is that from the sixteenth century onward, the landed classes were bought out and replaced by merchants who made fortunes in London or other commercial activities. The new landowners were assumed to bring middle class values with them, and that injection of bourgeois attitudes into the landed elite is taken by some to be the cause of rural reorganization to increase efficiency (Tawney 1941; Stone 1965; Habakkuk 1994; Collins and Havinden 2005). There were two reasons these changes were happening. One was that the old landowners were nonentrepreneurial while the new landowners were rich and had values of which Clark approves. A second is that the old aristocracy did not have enough children to reproduce itself. For most of the early modern period, one quarter of the owners of English estates died without a surviving son, and that percentage increased to almost half in the late seventeenth and eighteenth centuries (Stone

and Stone 1984, p. 101) Clark’s model of the relationship between the upper and the lower classes is contradicted by the standard understanding of the relationship between the aristocracy and the rest of British society in the early modern period.

The poor in the later Middle Ages did not exemplify middle class values.

We have little direct evidence about the attitudes of the poor in the later Middle Ages. Most of them were peasant farmers, and we should notice that Clark’s claim is a restatement of the old view that peasants are irrational. This view was current in development economics in the 1950s and 1960s when it was tested and rejected for modern peasant societies (Berry and Cline 1979, Booth and Sundrum 1985). While we cannot perform sophisticated tests on fifteenth century England, there is considerable evidence that small scale farmers were agricultural innovators. Cropping patterns can be reconstructed from probate inventories, and they show that peas and beans were adopted on a wide scale in the open fields by small scale farmers in the fifteenth and sixteenth centuries (Hoskins 1950, 1963). If farmers were innovative producers, why would we assume that they were not thrifty and forward looking?

By the eighteenth century, the poor had come to exemplify middle class values.

The history of popular culture is a favorite subject of social historians. There is no consensus on how popular attitudes changed. Burke (2006) argues for two reorientations. The first is a redefinition of life objectives in worldly rather than religious terms. Related to this is a decline in belief in magic and, conversely, greater credence for naturalistic explanations. The second is a greater interest in politics. This was closely related to the spread of newspaper reading. On the other hand, Sharpe (1997) doubts that belief in

witches and magic declined much and questions whether Newtonianism spread among the population at large. Neither provides any support for Clark's belief that middle class values spread down the social scale nor for his biological transmission mechanism.

The rich passed their values on to their children either genetically or by upbringing.

Clark never says clearly whether he believes values are passed from parents to children by socialization or by genetics, although he insinuates that genetics plays a role. Sociobiology is such a serious and contestable position that it should be asserted and defended if that is what Clark really means.

The problem with either genetics or socialization is that heritability is so low by either channel that Clark's mechanism could not spread middle class values through English society. Loehlin (2005) found that the intergenerational correlation of personality traits was only 0.13. If we ignore issues related to assortative mating on the grounds that English society was as "fluid" as Clark contends, then the correlation in personality traits between a man and his grand son would be only $0.017 = (.13)^2$. Locating personality in the genes would also imply low transmission (Feldman, Otto, and Christiansen 2000; Bowles and Gintis 2002; Bowles 2007).

The rich had more surviving children than the poor.

Clark is probably right about this in so far as it applies to the generality of society. An important exception, however, were the English landed classes. This is the true significance of Clark's anecdote that Malthus's line died out. The gentry and aristocracy were not reproducing and had to be replenished through the upward movement of merchants, as noted. Clark's model is wrong for the top of English society.

What if we ignore the top and look at the society from merchants downwards? In that way, we can at least assume that the apex had middle class values. However we must now confront the sectoral shifts of the English economy. The urban, commercial economy was growing rapidly, so merchants were proliferating. Between 1500 and 1800, the population of London, for instance, grew from fifty thousand to one million. Moreover, cities in the early modern period were death traps and only maintained their populations (let alone grew) through massive immigration from the countryside. Under these circumstances, the children of businessmen and artisans were not forced down the social ladder. They were needed to replace their parents and fill the growing number jobs of the same sort (or better) that were being created. Clark's assumption of "the static nature of the Malthusian economy" does not apply. Indeed, the failure of the landed classes meant that the children of merchants could rise rather than fall.

England was unusual in this regard.

This is not true. The well-off in southern German, Austria, France, Sweden, and Switzerland had more surviving children than the poor, just as in England (Clark 2007a; Hadeishi 2003; Low 1991; Perrenoud 1975). The English, in other words, were like everyone else.

What of Asia? The only evidence Clark adduces for differences elsewhere are the numbers of surviving children in the Chinese royal family and the Japanese samurai, but it would be hard to imagine families that were less representative than these. This conclusion is supported by an observation that Clark makes elsewhere in *A Farewell to Alms*: "In preindustrial China, however, gross fertility among high-status lineage groups in the Beijing nobility was lower than for peasants in Liaoning. Total marital fertility was higher in the lower-status

community, and the percentage of women marrying was somewhat higher” (p. 89). The top stratum in China looks similar to the top stratum in England, which could barely reproduce itself. By the same token, overall fertility in China cannot be inferred from the imperial lineage, so Clark’s comparisons between them and the English are misleading.

Indeed, the facts are even more unkind to Clark’s thesis. The comparison of Beijing nobility and Liaoning peasants is drawn from Lee and Wang’s (1999) survey of Chinese demography, which, in turn, is based on a very detailed investigation of population in Liaoning by Lee and Campbell (1997). In Liaoning, all men had military obligations and were enumerated in the so-called banner roles, which described their families in detail. Individuals’ occupations were also noted, so that fertility can be compared across occupational groups. High status, high income occupations had the most surviving sons: for instance, soldiers aged 46–50 had on average 2.57 surviving sons, artisans had 2.42 sons, and officials had 2.17 sons. In contrast, men aged 46–50 who were commoners had only 1.55 sons on average. The works on which Clark relies for his discussion of Chinese demography refute his thesis rather than support it.

6. *Why Did Productivity Growth Rise in the Industrial Revolution?*²

This question presents Clark with a dilemma. On the one hand, he wants to explain why the West is rich, and the Industrial Revolution is an unavoidable part of the answer. “The Industrial Revolution, a mere two hundred years ago, changed forever the possibilities for material consumption” (p. 2). On the other hand, he is, as always, the *enfant terrible* and wants to argue that the Industrial Revolution was an illusion: Nothing much really happened between

1760 and 1860. “A muted, gradual transition between the Malthusian and modern economies took place in England around 1800. Rapid productivity growth rates fully equal to those of modern economies did not appear until the late nineteenth century” (p. 242). His two views are difficult to reconcile.

Most scholars agree that the roots of the Industrial Revolution run back hundreds of years and growth accelerated gradually. Clark’s downplaying of the Industrial Revolution rests on a new set of national income estimates that indicate considerably lower rates of GDP and productivity growth than the established estimates of Crafts and Harley (1992).

Measurement of GDP is difficult due to the weaknesses of the data. Crafts and Harley estimate GDP growth by aggregating outputs. The problem they face is incomplete coverage and the choice of weights. Clark (2001, 2007a), on the other hand, tries to add up incomes. This requires knowing the quantities of the various factors and their prices, and the uncertainties with an income approach are greater than with output aggregation. The earliest year for which there is a careful estimate of the capital stock is 1760 (Feinstein 1978), so profits for earlier years are conjectures. Even after 1760, the growth of capital returns is underestimated because there is no information on the net income of unincorporated businesses. That is unfortunate since all businesses other than the railways and a few chartered entities like the East India Company were unincorporated, and their income was the most rapidly rising component of profits: The Industrial Revolution proliferated capitalists along with proletarians. Estimates of labor income are based on the population with little evidence on employment rates or the distribution of employment across earnings classes. In the case of land, Clark’s estimates of rents diverge considerably from those of other scholars (Turner, Beckett, and Afton 1997), and the

acres of arable, meadow, and pasture that should be valued are not firmly established. No scholar could argue that Clark's estimates are an improvement over those of Crafts and Harley.⁷

Lowering the rate of output growth in the Industrial Revolution leads to the question "why did the Industrial Revolution appear so dramatic" (p. 242) when it was such an inconsequential affair? Clark's answer is that the Industrial Revolution coincided with an acceleration of population growth after 1750 that increased the British population and national income relative to other powers (i.e., France) thus increasing Britain's power in the world. Clark ascribes the growth in population to an exogenous rise in fertility rather than to the economic expansion.⁸

Lowering the rate of output growth in the Industrial Revolution also narrows its scope. Whereas historians once thought that much of the economy was "revolutionized" during the Industrial Revolution, Crafts and Harley (1992) have argued revolutionary transforma-

tion was confined to a few sectors—textiles, iron, transportation, coal, and agriculture. Using export data, Temin (1997) has argued that change was even broader. Clark takes the view of Crafts and Harley even further: By squeezing yet more productivity growth out of the macro record, Clark pares the list of revolutionized industries down even more and emphasizes textiles. "Textiles were the flagship industry of the Industrial Revolution" (p. 233).

A difficulty with this view is that it makes it hard to explain why an Industrial Revolution occurred in England, and why it led to a sustained rise in the rate of economic growth. Clark's macroeconomic discussion is nothing more than another polemic against institutional explanations, particularly those relating to patents. Clark does suggest we can understand what happened in industry by discussing agriculture where productivity was also rising. "Thousands of individual cultivators in Industrial Revolution England somehow learned incrementally better methods from their neighbors or from their own observations. They did this despite the fact that their medieval cousins, with the same incentives, were unable to progress" (p. 239). This new transformation of behavior in the eighteenth century came from better values.

But currently, two more focused explanations for the upsurge in innovation are on offer. Both of them explain why the Industrial Revolution started in the eighteenth century, which is something Clark's theory cannot do. One explanation is the Scientific Revolution of the seventeenth century. It contributed important discoveries such as the fact that the atmosphere has weight and that steam can be condensed to form a vacuum. These ideas were the basis of the steam engine invented by Thomas Newcomen in the early eighteenth century. The Scientific Revolution also changed western culture making it mathematical and empirical. The application of these attitudes to the study of technology,

⁷ The assessment of Clark's national income estimates is hampered because he has not completed the paper Clark (2007b), which *A Farewell to Alms* references as the source of the national income estimates. I rely on Clark (2001), which presents similar series.

⁸ Clark (pp. 243–45) claims that fertility rate rose because more women married and were, therefore, "at risk" of pregnancy. In his view, marriage rates increased because of a decline in "deaths from pregnancy." These propositions are doubtful. First, half of the rise in fertility in the late eighteenth century was due to illegitimate births and premarital pregnancies: non-marital sex was on the rise (Wrigley 1981). Second, Clark has no information on "deaths from pregnancy." He assumes that all deaths for women 20–49 were due to pregnancy—certainly a false assumption. Guinnane (1997) studied the incident of death in child birth for late nineteenth century Ireland and Italy, both countries where fertility was high, and concluded that child birth was not the major cause of death for women. "Tuberculosis dwarfed maternal mortality as a cause of death" (Guinnane 1997, p. 119). Third, the significant drop in the "deaths from pregnancy" occurred after 1800, which is too late to explain the rise in fertility that started in 1750. The spread of nonagricultural wage employment in the eighteenth century (and with it a decline in the preventive check) looks a much more plausible explanation for the rise in the birth rate (Goldstone 1986).

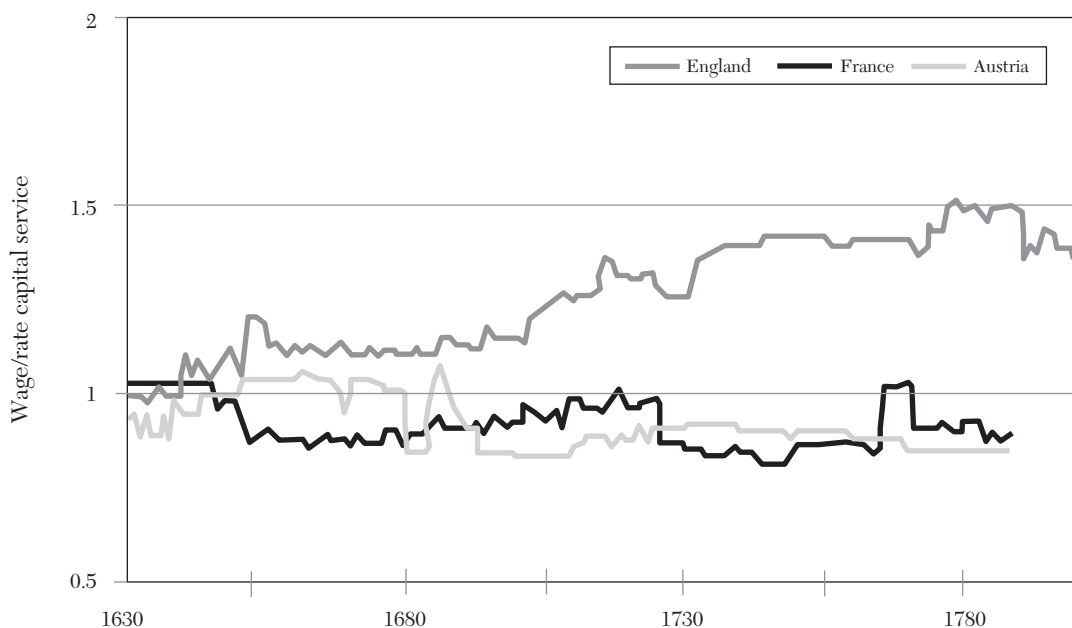


Figure 2. Ratio of Wage Rate to the Price of Capital Services

which Mokyr (2002) calls the Industrial Enlightenment, increased the rate of technical progress. Mokyr offers a contextualized version of Clark's "emergence of modern man" with a plausible explanation.

The second explanation is induced technical change in response to the unusual structure of wages and prices in Britain in the eighteenth century. British wages were remarkably high and energy was remarkably cheap. Figure 1 shows how British wages were high relative to the price of consumer goods. British wages were also high relative to the price of capital services as shown in figure 2. The early development of the coal industry meant that energy was very cheap in northern and western Britain near the coal fields. This structure of prices meant that it was profitable to develop machinery in Britain that substituted capital and energy for labor, whereas the same R&D

projects were unprofitable elsewhere in the world. The famous inventions of the Industrial Revolution like the steam engine and the spinning jenny were biased technical changes that cut costs at British factor prices but not generally. These new techniques were not taken up by manufacturers on the continent to any significant degree even though they were well known there. The decision not to use the spinning jenny in France, for instance, was a rational response to the labor saving bias of the technology and the differences in factor prices. The new technology that made the British Industrial Revolution was not worth using on the continent, so it was also not worth inventing it there: There were no benefits compensating for the R&D costs. The reason the Industrial Revolution was British was because it was profitable to invent the famous inventions in Britain whereas it was not profitable to do

the necessary R&D anywhere else (Allen 2007c, 2007d, forthcoming-b, Broadberry and Gupta forthcoming).

Britain's high wage, cheap energy economy was itself the result of Britain's success in the global economy of the early modern period. Growing trade, partly due to successful imperialism, caused London to grow from fifty thousand in 1500 to one million in 1800. Other cities grew rapidly in the eighteenth century. This boom was the immediate cause of the high wage economy. As London grew, so did the demand for fuel. Initially, it was wood. By 1585, its price had risen enough to make it profitable to mine coal in northeastern England and ship it to London. The boom in coal created the cheap energy economy in northern England. The availability of cheap fuel underpinned the high wage economy by fostering energy using industries that bid up the wage rate.

Clark is right to associate his views to a well-established consensus that the roots of the British Industrial Revolution run back to 1500. The question has always been how industrialization related to prior events. Political development linked to the Glorious Revolution of 1688 (North and Weingast 1989) has been one possibility, and Clark is probably right to discount that hypothesis. The rise of modern science and the growth of the global economy have always looked far more important than Clark's biological mechanisms in explaining the Industrial Revolution.

7. *Who Gained from the Industrial Revolution?*

A Farewell to Alms is not short on bold claims, and one of the boldest is that "stunningly, unskilled labor has reaped more gains than any other group" (p. 272) from the Industrial Revolution. Needless to say, this was not the view of contemporaries, whatever their political persuasions, nor has it been

the view of most historians. The usual view has been that the real wage grew slowly, if at all, from the late eighteenth century to the second quarter of the nineteenth, while output per worker advanced significantly. Clark, however, is adamant that "from 1760 to 1860 real wages in England rose faster than real output per person" (p. 272).

Clark reaches this eccentric conclusion on the basis of (a) his new estimate of GDP, which grows less rapidly than the Crafts–Harley series, and (b) his real wage series, which grows more rapidly than the most widely accepted series constructed by Feinstein (1998). Combining the Crafts–Harley and Feinstein series shows that between 1780 and 1840 real output per worker rose 46 percent while the real wage only increased 12 percent. Figure 3 shows the factor shares (in prices of the 1850s) that result from combining the Craft–Harley GDP series with a revision of Feinstein's real wage series and estimates of the quantities of land, labor, and capital and their prices. Capitalists were the big gainers (especially after 1800), while workers were losers. Their share of the national income dropped from 60 percent to a nadir of 45 percent (Allen 2007a, 2007b).

Should we prefer the data displayed in figure 3 to Clark's optimism? Earlier I gave some reasons for discounting Clark's GDP series. It is worth underlining the fact that Clark has no estimates of the profits of most businesses and assumes that returns on capital invested in the manufacturing sector grew at the same rate as other nonwage income which he can measure. His conjecture is contradicted by other national income accountants like Deane and Cole (1979) whose estimates, based on income tax data, indicate a rise in profits that is at least consistent with figure 3.

Clark's real wage index also suffers from serious weaknesses. One set of issues relates to weights. Compared to Feinstein, for instance, Clark places about ten percentage

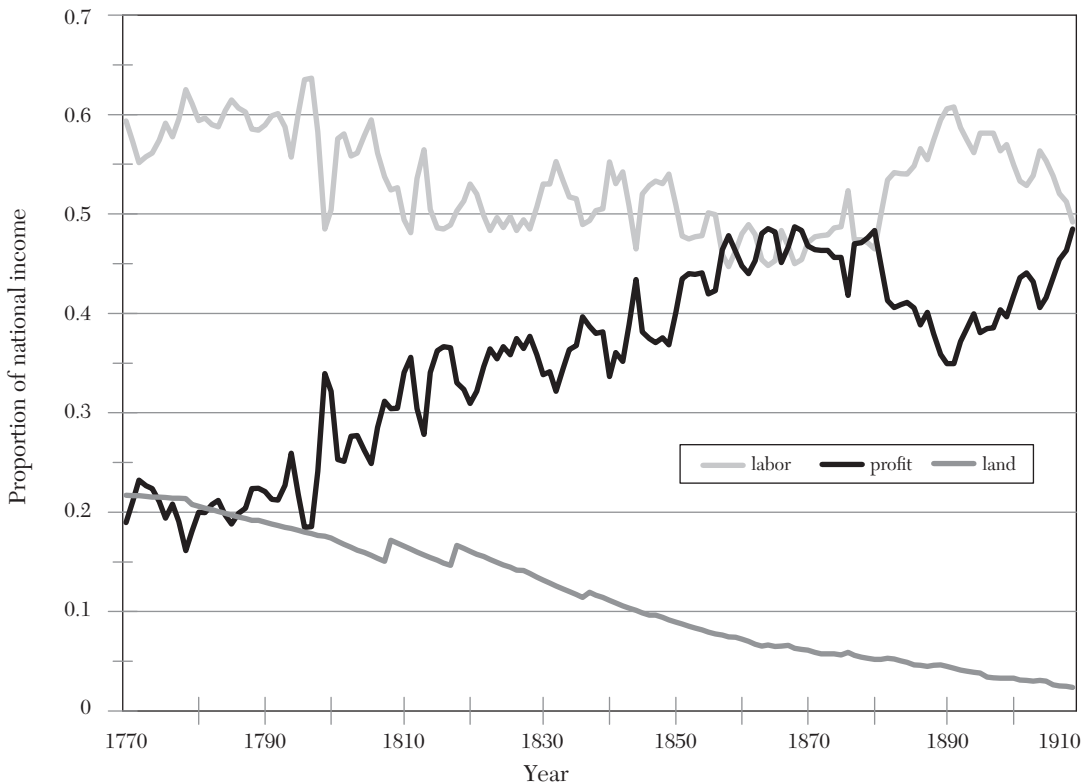


Figure 3. Factor Shares in 1850 Prices

points less weight on bread with the difference sprinkled over a variety of more luxurious goods like salt, spices, lighting, soap, services, and tobacco. Clark reaches the low bread share by relying on specious calculations published in a polemical pamphlet of the 1730s. Clark's bread share is inconsistent with more reliable evidence on expenditures, some of which he cites, and with comparisons of the supply of wheat and volume of bread baked. Another set of issues relates to the prices aggregated in his price index. Clark introduces a variety of new series, some of which are improvements and others of which are not. His beer price series, for instance, tracks the producer price of beer (excluding excise duties)

rather than the consumer price inclusive of duties, which is relevant to questions of welfare. Particularly distorting is his use of the price of wheat to proxy the price of bread—a particularly curious choice since we have been very well informed about bread prices across Britain for this period (Peterson 1995). When we choose the most defensible price series from those used by Feinstein and by Clark and when we aggregate them with weights that are based on spending evidence, we reach a consumer price index much closer to Feinstein's than to Clark's (Allen 2007a). This index supports the distributional story of figure 3. Capitalists—not workers—were the gainers during the Industrial Revolution.

8. *Why Isn't the Whole World Developed?*

In the final section of the book, Clark takes up the question of the Great Divergence: Why have rich countries grown faster than poor countries?

Predictably, Clark gives this question a paradoxical twist by arguing that technology and institutions should have accelerated growth in poor countries in the nineteenth century. Railroads, steam ships, and the telegraph cut the cost of conducting business between Asia or Latin America and Britain. Political arrangements like the British Empire provided protection for property and low transaction costs. Despite these favorable institutional developments, Asia did not grow.

Clark did not, however, approach this problem from a general equilibrium perspective. Instead, he focuses on input requirements of cotton production in different countries. He believes that India ought to have been able to set up cotton mills that would have competed successfully with British mills by importing British machinery and operating it with low wage Indian labor. Indeed, after 1870, this was done in Bombay. The industry grew rapidly, although it did not succeed in wresting the world market from Britain. Clark lays the blame squarely on Indian workers. "The problem of persistent inefficiency in labor use in poor countries like India was the main barrier to the spread of the technologies of the Industrial Revolution" (pp. 345–46).

Thus, Asian underdevelopment, provides another example of his biological explanation for economic success. "The demographic system in both these societies [China, Japan and presumably also India, although Clark has no data] gave less reproductive advantage to the wealthy than in England." As a result, in Asia the middle class values were not widely diffused, and the population at large was lazy and unenterprising. Clark (p. 354) quotes a commentator in 1930 that "Labor in India

is undoubtedly on a very low par, probably it comes next to Chinese labor in inefficiency, wastefulness, and lack of discipline." Clark (p. 354) quotes several observers to this effect, which he later endorses (p. 357), although he remarks that some of this literature was "overtly racist" (p. 354). And so it would seem when Clark's middle class values are assumed to be inherent in peoples' genes.

Clark's analysis of the cotton industry is a reformulation of his well known paper "Why isn't the Whole World Developed? Lessons from the Cotton Mills" (1987). His framework has been controversial, with many scholars offering other explanations for international differences in productivity (Amsden 2001, Wilkins 1987, Hanson 1988, Wolcott 1994). Clark's argument is based on a particular characterization of technology, namely, that capital and labor are used in fixed proportions. This view is prompted by his sources, which are management reports written in the early twentieth century. Their focus is narrowly on the number of workers employed in conjunction with particular kinds of machines. Clark assumes that the labor employed on a particular loom in Britain or the United States indicates the labor necessary to operate the machine. If, for example, more workers were associated with a machine in India, the extra labor was defined as superfluous. "There is no sign that mills in low-wage countries gained more output per machine by employing these supernumerary workers" (p. 340); in other words, the marginal product of labor was zero. The assumption of the fixed proportions is critical and underpins his claim that "capital-labor substitution is . . . irrelevant in explaining the excess manning of the low-wage countries" (Clark 1987, p. 156). For Clark, "labor intensive industrialization" is an illusion, although other scholars see it as the explanation of Asian success (Sugihara 2007).

Sir Arthur Lewis (1954) made his reputation by claiming that the marginal product

of labor in peasant agriculture was zero. This contention has been contradicted, however, by numerous production function studies that show that the marginal product of labor was positive. Clark is arguing that the problem of underdevelopment lies not on the farm but in the factory where, he believes, the marginal product of labor was indeed zero. Again production function studies provide a test, and one which Clark accepts: "For the process [of capital-labor substitution] to produce the observed effects production processes must follow the Cobb-Douglas production function" (p. 357, n. 8). India is Clark's principal example, and it is also a country whose cotton textile industry has been much studied econometrically. Some studies have estimated the elasticity of substitution between capital and labor, and it turns out to have been close to one, as Clark requires (Sankar 1970; Banerji 1974). More studies have estimated Cobb-Douglas production functions as well as more flexible forms, and they confirm that the marginal product of labor was positive (Murty and Sastry 1957; Sankar 1970; Banerji 1974; Mitra 1999). Studies for other industries and for manufacturing as a whole point to the same conclusions and call into question the whole edifice of argumentation that Clark erects on his assumptions about fixed proportions in cotton mills.

Furthermore, Clark has changed his explanation from the one offered in his original article. In *A Farewell to Alms*, high manning levels are blamed on the workers: "The overstaffing in poor countries resides principally in the workers" (p. 359). In 1987, however, he concluded: "Whatever limits the efficiency of workers in low-wage countries seems to attach to the local environment, not to the workers themselves" (Clark 1987, p. 168). This conclusion was based on an analysis of immigrant workers employed in America and other countries. In New England in 1911, immigrants from poor

countries with unproductive textile industries worked at American standards of efficiency and earned as much as anyone else. Clark claims that selectivity cannot explain this. In general, the productivity of immigrant labor depended on the country they went to rather than the country they came from. "German mills employed numbers of migrant Poles, Swiss mills employed migrant Italian workers, and the Peruvian mills employed Chinese workers, none of whom showed the extraordinary productivity of immigrants to the American mills" (Clark 1987, p. 167). *A Farewell to Alms* seems, to this reviewer, to offer no compelling answer to Clark (1987).

Setting that issue aside, why are workers in poor countries of low quality? Here Clark's argument unravels, for he offers three contradictory explanations. The first is the biological argument deployed elsewhere in the book. The second is an institutional argument, namely, that the workers strike in response to manning reductions and demand to share in efficiency gains through higher wages. This cuts the gains from rationalization, but how the workers obtain such power in a low wage country with enormous labor turnover is not clear (Clark and Wolcott 1999; Wolcott 1994; Buchanan 1934). The third is no explanation at all. "Regarding the underlying cause of the differences in labor quality, there is no satisfactory theory. Economies seem, to us, to alternate more or less randomly between relatively energetic phases and phases of somnolence" (p. 370). Success and failure are now put down to chance and not even biology matters.

This cul-de-sac shows the limits of Clark's view of development. To advance, we need to pay more attention to institutions and to culture. Clark's description of the cotton mills shows that it is not laziness or incapacity that led to the proliferation of jobs but rather a set of deals between workers, members of their families and the communities from which

they came, the owners and managers of the mills, and even the government whose investigations provide so much of the material to make Clark's case. By analyzing their interests and opportunities, we might understand the staffing patterns observed by Clark.

One feature underlying the job sharing that Clark describes is surely the low standard of living in the developing world, and that must be, at least in part, a consequence of the rapid growth in population. Demography is missing from Clark's diagnosis of the ills of the third world, and that is curious given the emphasis he placed on it in the first part of the book. He never attempts to explain why fertility rates dropped in the West. How the developing world will effect a fertility transition is of singular importance in assessing its future prospects (including the level of manning in textile mills). Here culture and state policy play roles. Clark emphasized that development requires "the emergence of modern man," but it requires the emergence of modern women at least as much. It is women who have children, and the likelihood of their doing so declines as they are educated and work outside the home (Schultz 1997; De Moor and van Zanden 2005). Educating women is a matter of state policy, and an initiative that can be particularly effective.

9. Conclusion

A Farewell to Alms is readable because it offers sweeping answers based upon parsimonious theory to complex questions about long run economic growth. Clark's answers resonate with today's headlines, for he has written an economic history of the world that is the counterpart to the "clash of civilizations." Indeed, his biological arguments for the superiority of Anglo-American culture make the differences between the West and the Rest unbridgeable and a source of perpetual conflict. Normally, it is distressing

to find that the central theses of a book are contradicted by well-known evidence, but in this case it is a relief given the pessimistic prospect that *A Farewell to Alms* holds out for the future of the world.

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