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## In Dusty Archives, a Theory of Affluence

By [NICHOLAS WADE](#)

For thousands of years, most people on earth lived in abject poverty, first as hunters and gatherers, then as peasants or laborers. But with the Industrial Revolution, some societies traded this ancient poverty for amazing affluence.

Historians and economists have long struggled to understand how this transition occurred and why it took place only in some countries. A scholar who has spent the last 20 years scanning medieval English archives has now emerged with startling answers for both questions.

Gregory Clark, an economic historian at the [University of California](#), Davis, believes that the Industrial Revolution — the surge in economic growth that occurred first in England around 1800 — occurred because of a change in the nature of the human population. The change was one in which people gradually developed the strange new behaviors required to make a modern economy work. The middle-class values of nonviolence, literacy, long working hours and a willingness to save emerged only recently in human history, Dr. Clark argues.

Because they grew more common in the centuries before 1800, whether by cultural transmission or evolutionary adaptation, the English population at last became productive enough to escape from poverty, followed quickly by other countries with the same long agrarian past.

Dr. Clark's ideas have been circulating in articles and manuscripts for several years and are to be published as a book next month, "A Farewell to Alms" (Princeton University Press). Economic historians have high praise for his thesis, though many disagree with parts of it.

"This is a great book and deserves attention," said Philip Hoffman, a historian at the [California Institute of Technology](#). He described it as "delightfully provocative" and a "real challenge" to the prevailing school of thought that it is institutions that shape economic history.

Samuel Bowles, an economist who studies cultural evolution at the Santa Fe Institute, said Dr. Clark's work was "great historical sociology and, unlike the sociology of the past, is informed by modern economic theory."

The basis of Dr. Clark's work is his recovery of data from which he can reconstruct many features of the English economy from 1200 to 1800. From this data, he shows, far more clearly than has been possible before, that the economy was locked in a Malthusian trap — each time new technology increased the efficiency of production a little, the population grew, the extra mouths ate up the surplus, and average

income fell back to its former level.

This income was pitifully low in terms of the amount of wheat it could buy. By 1790, the average person's consumption in England was still just 2,322 calories a day, with the poor eating a mere 1,508. Living hunter-gatherer societies enjoy diets of 2,300 calories or more.

"Primitive man ate well compared with one of the richest societies in the world in 1800," Dr. Clark observes.

The tendency of population to grow faster than the food supply, keeping most people at the edge of starvation, was described by Thomas Malthus in a 1798 book, "An Essay on the Principle of Population." This Malthusian trap, Dr. Clark's data show, governed the English economy from 1200 until the Industrial Revolution and has in his view probably constrained humankind throughout its existence. The only respite was during disasters like the Black Death, when population plummeted, and for several generations the survivors had more to eat.

Malthus's book is well known because it gave Darwin the idea of natural selection. Reading of the struggle for existence that Malthus predicted, Darwin wrote in his autobiography, "It at once struck me that under these circumstances favourable variations would tend to be preserved, and unfavourable ones to be destroyed. ... Here then I had at last got a theory by which to work."

Given that the English economy operated under Malthusian constraints, might it not have responded in some way to the forces of natural selection that Darwin had divined would flourish in such conditions? Dr. Clark started to wonder whether natural selection had indeed changed the nature of the population in some way and, if so, whether this might be the missing explanation for the Industrial Revolution.

The Industrial Revolution, the first escape from the Malthusian trap, occurred when the efficiency of production at last accelerated, growing fast enough to outpace population growth and allow average incomes to rise. Many explanations have been offered for this spurt in efficiency, some economic and some political, but none is fully satisfactory, historians say.

Dr. Clark's first thought was that the population might have evolved greater resistance to disease. The idea came from Jared Diamond's book "Guns, Germs and Steel," which argues that Europeans were able to conquer other nations in part because of their greater immunity to disease.

In support of the disease-resistance idea, cities like London were so filthy and disease ridden that a third of their populations died off every generation, and the losses were restored by immigrants from the countryside. That suggested to Dr. Clark that the surviving population of England might be the descendants of peasants.

A way to test the idea, he realized, was through analysis of ancient wills, which might reveal a connection between wealth and the number of progeny. The wills did that, but in quite the opposite direction to what he had expected.

Generation after generation, the rich had more surviving children than the poor, his research showed. That meant there must have been constant downward social mobility as the poor failed to reproduce themselves and the progeny of the rich took over their occupations. "The modern population of the English is largely

descended from the economic upper classes of the Middle Ages,” he concluded.

As the progeny of the rich pervaded all levels of society, Dr. Clark considered, the behaviors that made for wealth could have spread with them. He has documented that several aspects of what might now be called middle-class values changed significantly from the days of hunter gatherer societies to 1800. Work hours increased, literacy and numeracy rose, and the level of interpersonal violence dropped.

Another significant change in behavior, Dr. Clark argues, was an increase in people’s preference for saving over instant consumption, which he sees reflected in the steady decline in interest rates from 1200 to 1800.

“Thrift, prudence, negotiation and hard work were becoming values for communities that previously had been spendthrift, impulsive, violent and leisure loving,” Dr. Clark writes.

Around 1790, a steady upward trend in production efficiency first emerges in the English economy. It was this significant acceleration in the rate of productivity growth that at last made possible England’s escape from the Malthusian trap and the emergence of the Industrial Revolution.

In the rest of Europe and East Asia, populations had also long been shaped by the Malthusian trap of their stable agrarian economies. Their workforces easily absorbed the new production technologies that appeared first in England.

It is puzzling that the Industrial Revolution did not occur first in the much larger populations of China or Japan. Dr. Clark has found data showing that their richer classes, the Samurai in Japan and the Qing dynasty in China, were surprisingly infertile and so would have failed to generate the downward social mobility that spread production-oriented values in England.

After the Industrial Revolution, the gap in living standards between the richest and the poorest countries started to accelerate, from a wealth disparity of about 4 to 1 in 1800 to more than 50 to 1 today. Just as there is no agreed explanation for the Industrial Revolution, economists cannot account well for the divergence between rich and poor nations or they would have better remedies to offer.

Many commentators point to a failure of political and social institutions as the reason that poor countries remain poor. But the proposed medicine of institutional reform “has failed repeatedly to cure the patient,” Dr. Clark writes. He likens the “cult centers” of the [World Bank](#) and [International Monetary Fund](#) to prescientific physicians who prescribed bloodletting for ailments they did not understand.

If the Industrial Revolution was caused by changes in people’s behavior, then populations that have not had time to adapt to the Malthusian constraints of agrarian economies will not be able to achieve the same production efficiencies, his thesis implies.

Dr. Clark says the middle-class values needed for productivity could have been transmitted either culturally or genetically. But in some passages, he seems to lean toward evolution as the explanation. “Through the long agrarian passage leading up to the Industrial Revolution, man was becoming biologically more adapted to the modern economic world,” he writes. And, “The triumph of capitalism in the modern world thus may lie as much in our genes as in ideology or rationality.”

What was being inherited, in his view, was not greater intelligence — being a hunter in a foraging society requires considerably greater skill than the repetitive actions of an agricultural laborer. Rather, it was “a repertoire of skills and dispositions that were very different from those of the pre-agrarian world.”

Reaction to Dr. Clark’s thesis from other economic historians seems largely favorable, although few agree with all of it, and many are skeptical of the most novel part, his suggestion that evolutionary change is a factor to be considered in history.

Historians used to accept changes in people’s behavior as an explanation for economic events, like Max Weber’s thesis linking the rise of capitalism with Protestantism. But most have now swung to the economists’ view that all people are alike and will respond in the same way to the same incentives. Hence they seek to explain events like the Industrial Revolution in terms of changes in institutions, not people.

Dr. Clark’s view is that institutions and incentives have been much the same all along and explain very little, which is why there is so little agreement on the causes of the Industrial Revolution. In saying the answer lies in people’s behavior, he is asking his fellow economic historians to revert to a type of explanation they had mostly abandoned and in addition is evoking an idea that historians seldom consider as an explanatory variable, that of evolution.

Most historians have assumed that evolutionary change is too gradual to have affected human populations in the historical period. But geneticists, with information from the human [genome](#) now at their disposal, have begun to detect ever more recent instances of human evolutionary change like the spread of lactose tolerance in cattle-raising people of northern Europe just 5,000 years ago. A study in the current *American Journal of Human Genetics* finds evidence of natural selection at work in the population of Puerto Rico since 1513. So historians are likely to be more enthusiastic about the medieval economic data and elaborate time series that Dr. Clark has reconstructed than about his suggestion that people adapted to the Malthusian constraints of an agrarian society.

“He deserves kudos for assembling all this data,” said Dr. Hoffman, the Caltech historian, “but I don’t agree with his underlying argument.”

The decline in English interest rates, for example, could have been caused by the state’s providing better domestic security and enforcing property rights, Dr. Hoffman said, not by a change in people’s willingness to save, as Dr. Clark asserts.

The natural-selection part of Dr. Clark’s argument “is significantly weaker, and maybe just not necessary, if you can trace the changes in the institutions,” said Kenneth L. Pomeranz, a historian at the University of California, Irvine. In a recent book, “*The Great Divergence*,” Dr. Pomeranz argues that tapping new sources of energy like coal and bringing new land into cultivation, as in the North American colonies, were the productivity advances that pushed the old agrarian economies out of their Malthusian constraints.

Robert P. Brenner, a historian at the University of California, Los Angeles, said although there was no satisfactory explanation at present for why economic growth took off in Europe around 1800, he believed that institutional explanations would provide the answer and that Dr. Clark’s idea of genes for capitalist behavior was “quite a speculative leap.”

Dr. Bowles, the Santa Fe economist, said he was “not averse to the idea” that genetic transmission of capitalist values is important, but that the evidence for it was not yet there. “It’s just that we don’t have any idea what it is, and everything we look at ends up being awfully small,” he said. Tests of most social behaviors show they are very weakly heritable.

He also took issue with Dr. Clark’s suggestion that the unwillingness to postpone consumption, called time preference by economists, had changed in people over the centuries. “If I were as poor as the people who take out payday loans, I might also have a high time preference,” he said.

Dr. Clark said he set out to write his book 12 years ago on discovering that his undergraduates knew nothing about the history of Europe. His colleagues have been surprised by its conclusions but also interested in them, he said.

“The actual data underlying this stuff is hard to dispute,” Dr. Clark said. “When people see the logic, they say ‘I don’t necessarily believe it, but it’s hard to dismiss.’”

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