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Did living standards improve during the Industrial Revolution?

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AS WE showed in a [previous blog post](http://www.economist.com/blogs/freeexchange/2013/08/economic-history-1) (<http://www.economist.com/blogs/freeexchange/2013/08/economic-history-1>), Europe went through a period of astonishing growth after about 1760. The level of income that Europe has today could not have been reached without the Industrial Revolution.

In fact, people often refer to two revolutions (though historians bicker about terminology). The First Industrial Revolution was about the introduction of machines, often powered with water or steam. It lasted from roughly 1760 to 1850. The Second Industrial Revolution used more advanced technologies, such as the internal combustion engine and electricity. It lasted from roughly 1850 to 1910.

We know that the Industrial Revolution made Europe rich. But what was it like to live through it? Britain has the most complete historical records when it comes to this kind of thing, so this post will focus on that country.

The question boils down to how you measure living standards. Historians are divided over what happened to wages during the Industrial Revolution. Everyone agrees that they did increase; the question is, when.

Research focuses on real wages—wages that are adjusted for inflation. Getting data on wages is tricky. But accounting for inflation is even harder. (For example, workers often paid rent informally, meaning that there are few records around).

And so it is unsurprising that researchers differ in their estimations of real wages. Some, such as Peter Lindert and Jeffrey Williamson, suggest that full-time earnings for British common labourers, adjusted for inflation, more than doubled in the seventy years after 1780. But Charles Feinstein argued that over the same period, British real wages only increased by around 30%. It's a bit of an academic mess.

Most people agree that after about 1840, real wages did better. Nicholas Crafts and Terence Mills shows that from 1840 to 1910, real wages more than doubled. Their findings are mirrored by other researchers (see below right). Improvements may be due to technological innovation, which led to big increases in labour productivity and hence higher wages. Others reckon it is because the cost of living did not increase so fast. And the massive economic impact of the Napoleonic Wars—where, due to naval warfare, exporters suffered and imports were more expensive—gradually wore off.

So,
while
the



Source: Clark, 2005

Industrial Revolution ultimately led to big increases in wealth, progress was unsteady. For much of the period, the average person was not reaping the benefits of economic change.

So much for wages. Other measures of standard of living should be considered.

There is increased enthusiasm for biological measures of standard of living, such as people's height. Height is a useful measure for a number of reasons. It indicates how well someone is nourished. And people who do less manual labour, or who are less afflicted by disease, are likely to be taller. A person's height is not perfectly correlated with their standard of living—after all, Bill Gates is not a physical giant. But 20-40% of the difference in height between individuals is determined by environmental factors. And so at an aggregate level, height data are pretty

helpful.

Researchers find height data from different places, including army archives; it is common practice to measure the stature of new recruits. Data can also be found in school records. Academics have even consulted records of people transported from England to penal colonies in Australia.

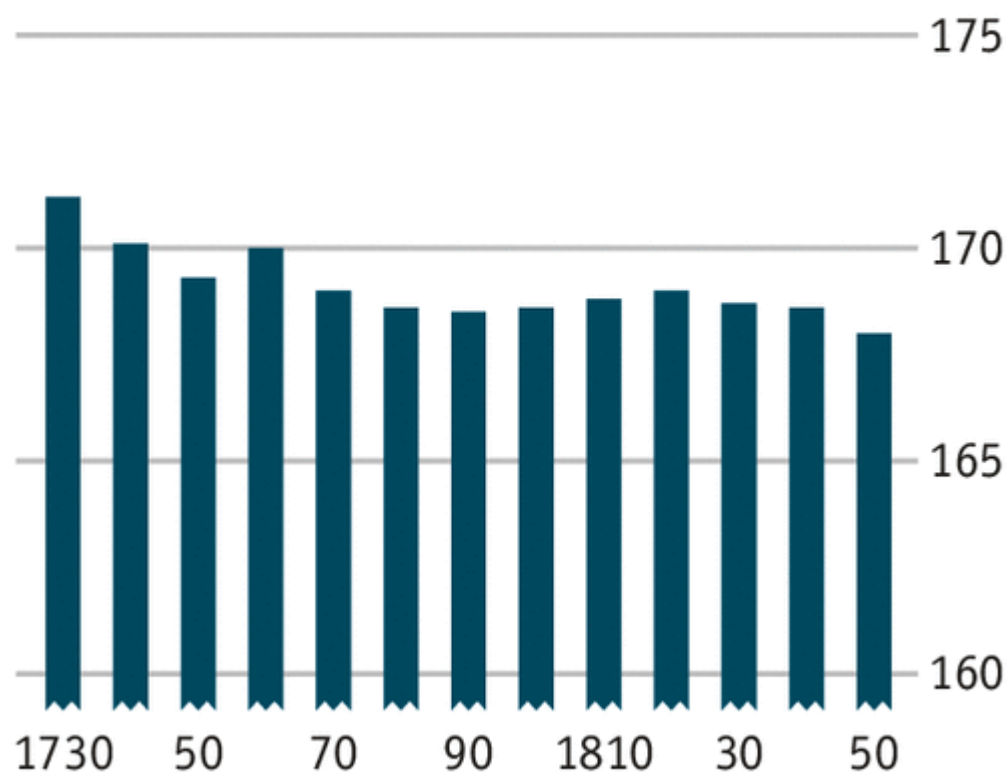
Some research presents a rather alarming picture. Below is a graph which shows the height of English soldiers from 1730 to 1850—a period which captures the First Industrial Revolution.

There
are
many



Mean height of English soldiers

Aged 20-23 years old, cm



Source: Komlos, 1998

different explanations for height declines during this period. Some people reckon that diseases in cities exploded. Other people think that unsteady economic growth led to increases in the frequency of unemployment, which had an impact on nutrition. And growth of agriculture may have lagged behind economic growth—which meant that the relative price of nutrients increased at a time when transportation was poor and food preservation was primitive.

Other research has shown that city dwellers tended to be shorter than rural folk, even though the urbanites were generally richer. Access to food was easier for those living in rural areas, and so they were better insulated from the effects of harvest failure.

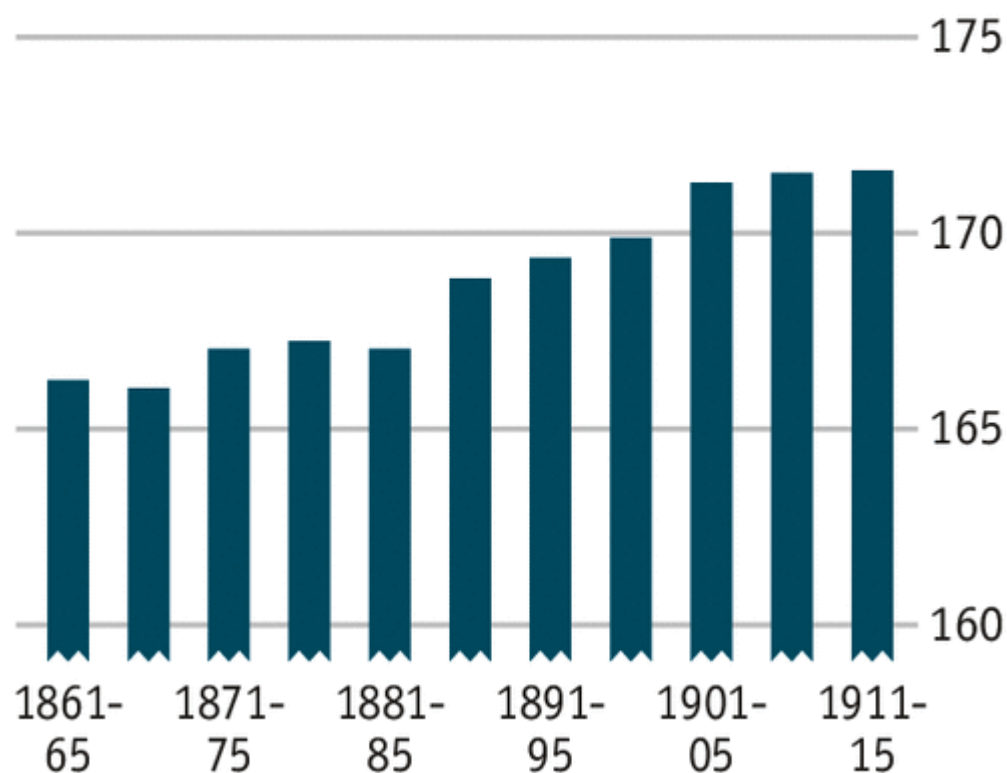
Another paper suggests that it was only in the latter part of the 19th century that growth in heights took off. Wages rose and advances were made in food safety and public health. And for the last 150 years, Britain has been on a steady upward path (see below).

You
can
tell a



Mean height of men

By birth cohorts, cm



Source: Hatton & Bray, 2010

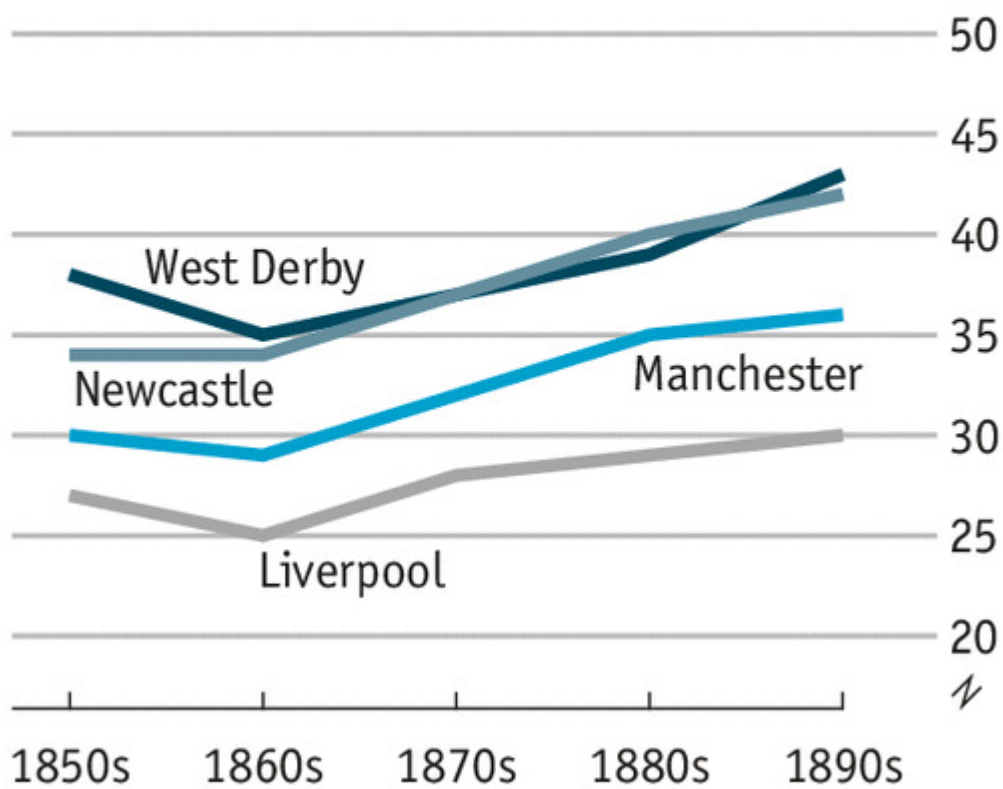
similar story about life expectancy. The “expectation of life at birth” (its official name) is calculated by looking at death registrars. If you know the distribution of ages at which people die, you can work out the most likely age to which people will live.

Once again, the picture is not rosy. For instance, in almost all British cities, mortality conditions in the 1860s were no better—and were often worse—than in the 1850s. In Liverpool in the 1860s, the life expectancy fell to an astonishing 25 years. It was not until the two subsequent decades that rises in life expectancy were found (see below right).

Economic history now has very advanced ways of measuring quality of life. But quantitative wizardry does not capture the experience of living through such rapid change. Less maths-y history is needed too. EP Thompson, an English historian, was not a great fan of numbers. He was more interested in getting inside people’s minds. One of his most famous papers, published in 1967, tries to understand what it was like for people living through rapid economic change. As Britain shifted to fully-fledged capitalism, Thompson reckons that people felt under more

Life expectancy at birth

Cities in England, years



Source: Szreter and Mooney, 1998

pressure to work hard:

Time is now currency: it is not passed but spent.

The English worker in the throes of industrial capitalism was marked by

his regularity, his methodical paying-out of energy, and perhaps also...a repression, not of enjoyments, but of the capacity to relax in the old, uninhibited ways.

Hard-nosed economic historians (sometimes known as cliometricians) sneer at Thompson's style of history. For them, using poems as source material, and writing lyrical sentences—as Thompson is prone to do—is not good scholarship.

But we need both the number-crunchers and the artsy types if we want to understand the consequences of economic growth. That is as true today as it was during the industrial revolution. Wages might be rising, but other social indicators might be doing awfully. This was highlighted in a [recent book](http://www.economist.com/news/books-and-arts/21580124-why-worlds-biggest-democracy-still-fails-too-many-its-people-beyond-bootstraps) (<http://www.economist.com/news/books-and-arts/21580124-why-worlds-biggest-democracy-still-fails-too-many-its-people-beyond-bootstraps>), written by Amartya Sen and Jean Drèze, which looks at India. Economic history is not just about hard economics, but also about how people experience economic change.

Suggested reading list:

Allen, R. C. (2007). '[Pessimism Preserved: Real Wages in the British Industrial Revolution](http://www.economics.ox.ac.uk/Research/wp/pdf/paper314.pdf)' (<http://www.economics.ox.ac.uk/Research/wp/pdf/paper314.pdf>)'. *Oxford University Department of Economics Working Paper 314*. [Very advanced paper on how to calculate real wages].

Clark, G. (2005). '[The condition of the working class in England, 1209–2004](http://piketty.pse.ens.fr/files/ClarkJPE2005.pdf)' (<http://piketty.pse.ens.fr/files/ClarkJPE2005.pdf>)'. *Journal of Political Economy*, 113(6), 1307-1340. [Looks at real wages over a (very) long time-frame].

Drèze, J., & Sen, A. (2013). *An Uncertain Glory: India and its Contradictions*. Allen Lane. [Discussion of how economic growth does not necessarily lead to social progress].

Feinstein, C. H. (1998). '[Pessimism perpetuated: real wages and the standard of living in Britain during and after the Industrial Revolution](http://www.jstor.org/stable/2566618)' (<http://www.jstor.org/stable/2566618>)'. *Journal of Economic History*, 58, 625-658. [Paper from an ex-economic history prof at Oxford. Also has some useful discussion on alternative measures of living standards].

Lindert, P. H., & Williamson, J. G. (1983). '[English Workers' Living Standards During the Industrial Revolution: A New Look](http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0289.1983.tb01221.x/abstract)' (<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0289.1983.tb01221.x/abstract>)'. *The Economic History Review*, 36(1), 1-25. [According to some, such as Charles Feinstein, a “super-optimistic” assessment of living standards].

Hatton, T. J., & Bray, B. E. (2010). '[Long run trends in the heights of European men, 19th–20th centuries](http://privatewww.essex.ac.uk/~hatton/Tim_height_paper.pdf)' (http://privatewww.essex.ac.uk/~hatton/Tim_height_paper.pdf)'. *Economics & Human Biology*, 8(3), 405-413. [Good overview of height trends in Europe during part of the Industrial Revolution].

Komlos, J. (1998) '[Shrinking in a Growing Economy? The Mystery of Physical Stature during the Industrial Revolution](http://www.jstor.org/stable/2566624)' (<http://www.jstor.org/stable/2566624>)', *Journal of Economic History*, 58, p. 779-802 [Good overview of how economic growth can influence height].

Nicholas, S., & Oxley, D. (1993). '[The living standards of women during the industrial revolution, 1795-1820](http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0289.1993.tb01359.x/abstract)' (<http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0289.1993.tb01359.x/abstract>)'. *The Economic History Review*, 46(4), 723-749. [This work tries to address a major gap in the literature—women's heights].

Szreter, S., & Mooney, G. (1998). '[Urbanization, mortality, and the standard of living debate: new estimates of the expectation of life at birth in nineteenth-century British cities](http://www.jstor.org/stable/2599693)' (<http://www.jstor.org/stable/2599693>)'. *The Economic History Review*, 51(1), 84-112. [Rather horrifying discussion of urban mortality during the Industrial Revolution].

Thompson, E. P. (1967). '[Time, work-discipline, and industrial capitalism](http://libcom.org)' (<http://libcom.org>

[/files/timeworkandindustrialcapitalism.pdf](#) ' . *Past & Present*, (38), 56-97. [Seminal paper on how capitalism influences people's understanding of time. For a rebuttal of this, see the fascinating: Glennie, P., & Thrift, N. (2009). *Shaping the Day: a History of timekeeping in England and Wales 1300-1800*. Oxford University Press].

Voth, H. J. (1998). 'Time and work in eighteenth-century London (<http://www.nuffield.ox.ac.uk/economics/history/paper21/21voth.pdf>) ' . *Journal of Economic History*, 58, 29-58. [Innovative paper which uses court records to work out how people's working hours changed over time].