

What the price of an ancient Roman nail tells us about value

About 2,000 years ago, Roman soldiers buried a million nails in a four-metre pit. Why?

Tim Harford JUNE 16 2023

Fifty miles north of what is now Edinburgh and nearly 2,000 years ago, the Roman empire's Twentieth Legion began to build a fort near the River Tay. By Roman standards, it was unremarkable, despite its 20-hectare size and earthworks several metres thick. It boasted a forge, hospital and granaries, but lacked baths and aqueducts — perhaps because it was abandoned just a few years after construction started, as the Romans began to pull out of Scotland.

They left behind a curious treasure: 10 tons of nails, nearly a million of the things. The nail hoard was discovered in 1960 in a four-metre-deep pit covered by two metres of gravel. The outer nails had rusted into a protective shell, leaving the inner nails in good condition.

There were so many that archaeologists were somewhat at a loss as to what to do with them all. Many of the nails were sold off as souvenirs to help fund the excavation, some as sets of five in commemorative boxes. It seems a little disrespectful today, but as the head of the dig, Sir Ian Richmond, commented, “Even if a set were sent to every museum on earth there would still be many tons left over.”

Why had the Romans buried a million nails? The likely explanation is that the withdrawal was rushed, and they didn't want the local Caledonians getting their hands on 10 tons of weapon-grade iron. The Romans buried the nails so deep that they would not be discovered for almost two millennia.

Later civilisations would value the skilled blacksmith's labour in a nail even more than the raw material. As Roma Agrawal explains in her new delightful book *Nuts and Bolts*, early 17th-century Virginians would sometimes burn down their homes if they were planning to relocate. This was an attempt to recover the valuable nails, which could be reused after sifting the ashes. The idea that one might burn down an entire house just to reclaim the nails underlines how scarce, costly and valuable the simple-seeming technology was.

The high price of nails at the time was partly because Britain had banned the export of precious nails to its colonies. The arguments about industrial policy and national security that now rage over silicon-chip-fabrication technology were relevant to the nail-making trade four centuries ago.

That all seems strange today, when nails are so cheap that few people even think to wonder how they got that way. The economist Daniel Sichel asks that question in a research paper published a couple of years ago, drawing on data ranging from the 18th-century accounts of Greenwich Hospital to wholesale nail prices in 19th-century Philadelphia. His headline finding is that the real price of nails was broadly unchanged through the 18th century, fell by 90 per cent between the late 1700s and mid-1900s, and has been rising ever since, partly because of the cost of raw materials, and perhaps because modern nails are more complex and customised than they used to be. And as Sichel points out, the price of “installed nails” remains incredibly cheap, thanks to the invention of the nail gun.

Why did prices fall so much after the late 1700s? One explanation comes from a foundational text of economics, Adam Smith’s *The Wealth of Nations*, which described the huge productivity of a then-modern pin factory, thanks to the specialisation of the manufacturing process. “One man draws out the wire, another straightens it, a third cuts it, a fourth points it, a fifth grinds it at the top for receiving the head”. This production process was hundreds of times more efficient than one person working alone.

Whether Smith himself had really seen such a factory is now a controversial question, but the underlying point is not. The division of labour and the growing automation of the process delivered cheaper pins and, no doubt, cheaper nails too. Sichel agrees: although the falling price of nails was driven partly by cheaper iron and cheaper energy, most of the credit goes to nail manufacturers who simply found more efficient ways to turn steel into nails.

Nails themselves have changed over the years, but Sichel studied them because they haven’t changed much. Roman lamps and Roman chariots are very different from LED strips and sports cars, but Roman nails are still clearly nails. It would be absurd to try to track the changing price of sports cars since 1695, but to ask the same question of nails makes perfect sense.

As Agrawal’s book explains, there is an endless fascination in everyday objects such as springs, wheels and nails, from the physics behind them to simple practical tips. (I did not know, until I read the book, that nails often bend not because I whack them too hard but because I don’t whack them hard enough.)

I make no apology for being obsessed by a particular feature of these objects: their price. I am an economist, after all. After writing two books about the history of inventions, one thing I’ve learnt is that while it is the enchantingly sophisticated technologies that get all the hype, it’s the cheap technologies that change the world.

The Gutenberg printing press transformed civilisation not by changing the nature of writing but by changing its cost — and it would have achieved little without a parallel collapse in the price of surfaces to write on, thanks to an often-overlooked technology called paper. Solar panels had a few niche uses until they became cheap; now they are transforming the global energy system.

A Roman nail and a modern nail have a similar form, but a radically different price. That alone is why one was a closely guarded treasure and the other is a disposable puncture hazard.

Tim Harford's children's book, "The Truth Detective" (Wren & Rook), is now available

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