It's been 230 years since British pirates robbed the US of the metric system

How did the world's largest economy get stuck with retro measurement?

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Feature In 1793, French scientist Joseph Dombey sailed for the newly formed United States at the request of Thomas Jefferson carrying two objects that could have changed America. He never made it, and now the US is stuck with a retro version of measurement that is unique in the modern world.

The first, a metal cylinder, was exactly one kilogram in mass. The second was a copper rod the length of a newly proposed distance measurement, the meter.

Jefferson was keen on the rationality of the metric system in the US and an avid Francophile. But Dombey's ship was blown off course, captured by English privateers (pirates with government sanction), and the scientist died on the island of Montserrat while waiting to be ransomed.

And so America is one of a handful of countries that maintains its own unique forms of weights and measures.

The reason for this history lesson? Over the last holiday period this hack has been cooking and is sick of this pounds/ounces/odd pints business – and don't even get me started on using cups as a unit of measurement.

It's time for America to get out of the Stone Age and get on board with the International System of Units (SI), as the metric system used to be known.

There's a certain amount of hypocrisy here – I'm British and we still cling to our pints, miles per hour, and I'm told drug dealers still deal in eighths and 'teenths in the land of my birth. But the American system is bonkers, has cost the country many millions of dollars, an increasing amount of influence, and needs to be changed.

Brits and Americans…

The cylinder and rod Dombey was carrying, the former now owned by the US National Institute of Standards and Technology, was requested by Jefferson because the British system in place was utterly irrational.

When the UK settled in the Americas they brought with them a bastardized version of weights, measures and currencies. A Scottish pint, for example, was almost triple the size of an English equivalent until 1824, which speaks volumes about the drinking culture north of the border.

British measurements were initially standardized in the UK's colonies, but it was a curious system, taking in Roman, Frankish, and frankly bizarre additions. Until 1971, in the UK a pound consisted of 240 pence, with 12 pence to the shilling and 20 shillings to the pound.

To make things even more confusing, individual settlements adopted their own local weights and measures. From 1700, Pennsylvania took control of its own measurements and other areas soon followed. But this mishmash of coins,

distances and weights held the country back and Jefferson scored his first success in the foundation of a decimal system for the dollar.

"I question if a common measure of more convenient size than the Dollar could be proposed. The value of 100, 1,000, 10,000 dollars is well estimated by the mind; so is that of a tenth or hundredth of a dollar. Few transactions are above or below these limits," he said [PDF].

So of course he's on the least popular note

Jefferson wanted something new, more rational, and he was not alone. In the first ever State of the Union address in 1790, George Washington observed: "Uniformity in the Currency, Weights and Measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to."

America was a new country, and owed a large part of the success of the Revolutionary War to France, in particular the French navy. The two countries were close, and the metric system appealed to Jefferson's mindset, and to many in the new nation.

And this desire for change wasn't just limited to weights and measures. Also in 1793, Alexander Hamilton hired Noah Webster, who as a lexicographer and ardent revolutionary wanted America to cast off the remnants of the old colonial power. Webster wrote a dictionary, current versions of which can be found in almost every classroom in the US.

And then politics and Napoleon happened

Jefferson asked the French for other samples including a copper meter and a copy of the kilogram, which was sent in 1795, but by then things had changed somewhat since he was no longer running the show. On January 2, 1794, he was replaced as US Secretary of State by fellow Founding Father Edmund Randolph, who was much less keen on the government getting involved in such things.

To make matters worse, relations between America and France were deteriorating sharply. The French government felt that the newly formed nation wasn't being supportive enough in helping Gallic forces fight the British in the largely European War of the First Coalition. In something of a hissy fit, the French government declined to invite representatives from the US to the international gathering at Paris in 1798-99 that set the initial standards for the metric system.

Jefferson's plans were kicked into committee and while a form of standardization based on pounds and ounces was approved by the House, the Senate declined to rule on the matter.

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Not that it mattered much longer. In 1812, Napoleon effectively abolished the enforcement of the metric system in France. Napoleon was known as Le Petit Caporal, with multiple reports he was five foot two. As we know now, he was around average height for the time.

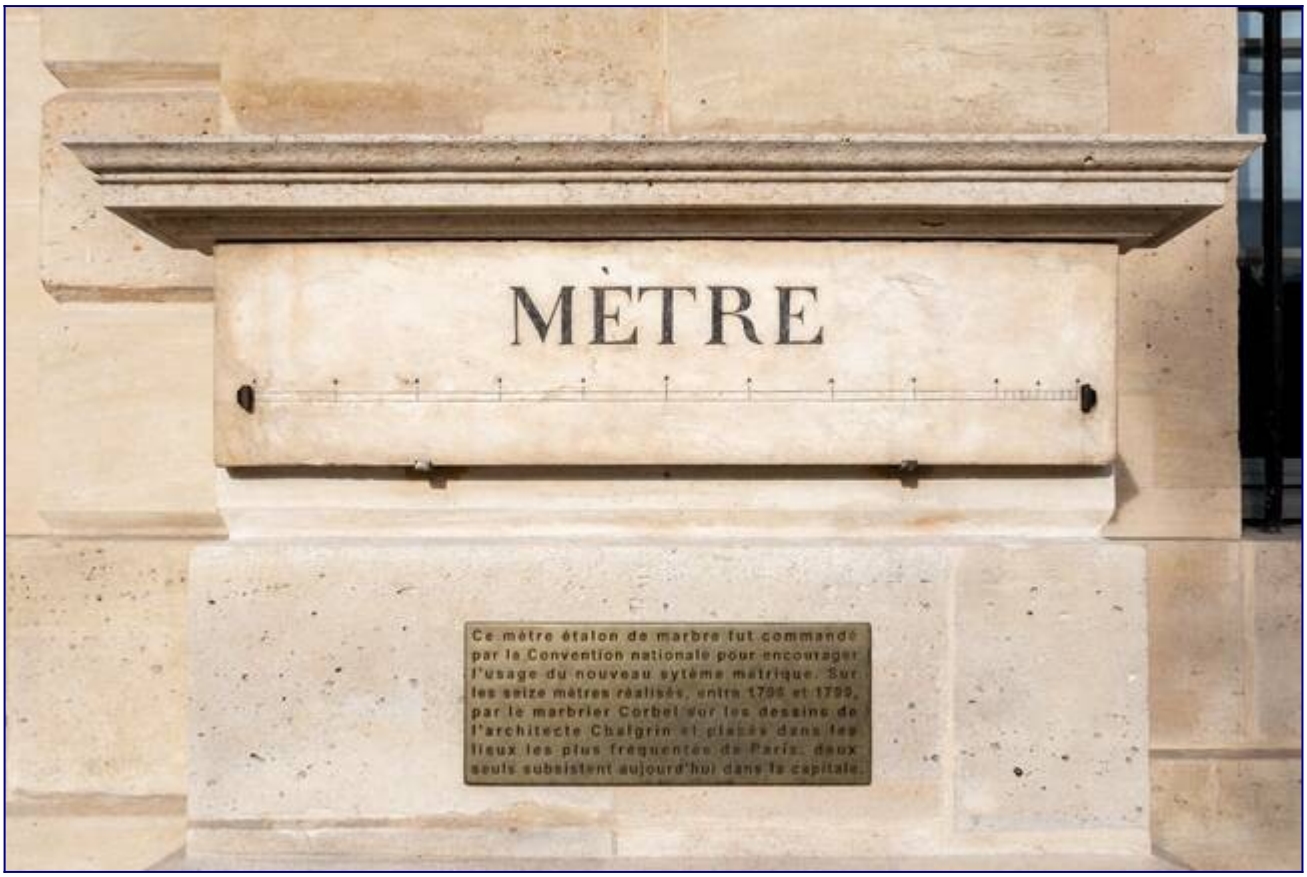
After the French dictator was defeated, the case for the metric system in France sank into near-limbo at first, as it did in the US. But it gradually spread across Europe because you can't keep a good idea down and science and industrialization were demanding it.

Welcome to the rational world

What has kept the metric system going is its inherent rationality. Rather than use a hodgepodge of local systems, why not build one based on measurements everyone could agree on configured around the number 10, which neatly matches the number of digits on most people's hands?

Above all it's universal, a gram means a gram in any culture. Meanwhile, buy a pint in the UK and you'll get 20oz of beer, do the same in America and, depending where you are, you'll likely get 16oz – a fact that still shocks British drinkers. The differences are also there with tons, and the odd concept of stones as a weight measurement.

Metric is by no means perfect. For example, in the initial French system, a gram, or grave as it was initially known, was the mass of one cubic centimeter of water. A meter was a 10 millionth of the distance between the pole and the equator – although the French weren't exactly sure how far that was at the time.



The original metre carved into the Place Vendôme in Paris, some adjustment required

Since then the system has been revised a lot with discoveries of more natural constants. For example, a meter is now 1/299,792,458 of the distance light travels during a second. As of 1967, the second itself has been defined as "the

duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium-133 atom," but better measurement by atomic clocks may change this.

The chief adherents to the metric system initially were scientists who desperately needed universal sources of measurement to compare notes and replicate experiments without the errors common when converting from one measuring system to another.

This is down to convoluted systems like 12 inches in a foot, three feet in a yard, 1,760 yards in a mile, compared to 100 centimeters in a meter and 1,000 meters to a kilometer. A US pound is 0.453592 kilograms, to six figures at least, these are the kind of numbers that cause mistakes to be made.

Most famously in recent memory was the Mars Climate Orbiter in 1999. The $125 million space probe broke up in the Martian atmosphere after engineers at Lockheed Martin, who built the instrument, used the US Customary System of measurement rather than metric measurements used by others on the project. The probe descended too close to the surface and was lost.

A more down-to-earth example came in 1983 with the Air Canada "Gimli Glider" incident, where pilots of a Boeing 767 underestimated the amount of fuel they needed because the navigational computer was measuring fuel in kilograms rather than pounds. With roughly 2.2 pounds to the kilogram, the aircraft took on less than half the fuel required and the engines failed at 41,000 feet (12,500m).

The two pilots were forced to glide the aircraft, containing 69 souls, to an old air force base in Gimli that luckily one of the pilots had served at. It was now being used as a drag strip but thankfully there were only a few minor injuries.

And don't even get me started on Celsius and Fahrenheit. With Celsius water freezes at 0 degrees and boils at 100 at ground level, compared to 32 and 212 for Fahrenheit. It's a nonsensical system and the US is now the only nation in the world to use Fahrenheit to measure regular temperatures.

The slow and winding road

Back in 1821, Secretary of State John Quincy Adams reported to Congress on the measurements issue. In his seminal study on the topic he concluded that while a metric system based on natural constants was preferable, the amount of kerfuffle needed to change from the current regime would be highly disruptive and he wasn't sure Congress had the right to overrule the systems used by individual states.

The disruption would have been large. The vast majority of America's high value trade was with the UK and Canada, neither of which were metric.

In addition, American and British manufacturers rather liked the old ways. With the existing system, companies manufactured parts to their own specifications, meaning if you wanted spares you had to go buy them from the original manufacturer. This proved highly lucrative.

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By the middle of the 19th century, things were changing... slightly. The US government scientists did start using some metric measurements for things like mapping out territory, even though its domestic system was more common for day-to-day use. The Civil War also spurred a push towards standardization, with some states like Utah briefly mandating the system.

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Two big changes came around in the 20th century following two World Wars. Interchangeability of parts, particularly bolt threading, seriously hampered the Allied forces. In 1947, America joined the International Organization for Standardization and bolt threads went metric. Today the US Army uses metric to better integrate with NATO allies.

This has continued ever since American manufacturers realized they would have to accommodate the new systems if it wanted to sell more kit abroad. Today there are technically US measurement parts still being manufactured, particularly in some industries, but there is at least a standardized system for converting these to metric measurements.

In the 1960s, metric was renamed as the Le Système international d'unités (International System of Units) or SI and things started moving again in America. After Congressional study, President Gerald Ford signed the Metric Conversion Act in 1975, setting a plan for America to finally go metric as "the preferred system of weights and measures for United States trade and commerce."

But it suffered some drawbacks. Firstly, the system was voluntary, which massively slowed down adoption. Secondly, a year later, the new US president Jimmy Carter was a strong proponent of the system, and this caused the opposition in Congress to largely oppose the plan.

President Reagan closed most of the moves to metric in 1982, but his successor, Bush, revived some of the plans in 1991, ordering US government departments to move over to metric as far as possible. The issue has been kicked down the road ever since.

Different cultures, different customs

These days the arguments over metric versus American measurements are more fraught, becoming a political issue between left and right. Witness Tucker Carlson's cringe-worthy rant in which he describes metric as "the yoke of tyranny," hilariously mispronouncing "kailograms."

Given that trust-fund kid Carlson was educated in a Swiss boarding school, he knows how it's pronounced, but never let the facts get in the way of invective.

As such, it seems unlikely that we'll see anything change soon. But that day is coming – America is no longer the manufacturing giant it was and China is perfectly happy with the metric system, although it maintains other measurement for domestic societal use like Britain does with pints and miles.

There's really no logical reason to not go metric – it's a simple, universal system used by every nation in the world except for the US, Liberia and Myanmar. That's hardly august company for the Land of the Free.

It will be a long, slow process. No country has managed a full shift to metric in less than a generation, with most it took two or more, and the UK seems to be going backwards. Now-former Prime Minister Boris Johnson was keen to see a return of the old UK Imperial measurements in Britain, which make the current American system look positively rational.

It may take generations before the issue is resolved in the UK, and longer still for the US. It may, in fact, never happen in America, but the SI system makes sense, is logically sound, and will remain the language of science, medicine and engineering for the vast majority of the world.

If the US doesn't want to play catch-up with the rest of the world it will have to take rational measurements seriously. But that day isn't coming soon, so in the meantime this hack will have to remain using old cookbooks and we'll face more measurement mistakes together. ®