

# Give them an inch

Political struggles, war and economics all played a part in the making of the metre

*World in the Balance: The historic quest for an absolute system of measurement* by Robert P. Crease, W. W. Norton, £18.99/\$26.95

Reviewed by Arthur I. Miller



PRECISION and fastidiousness – at first blush the quest for a precise system of measurement might seem a plodding pursuit.

But as philosopher Robert P. Crease makes clear in *World in the Balance*, it was anything but.

From prehistory to the present, Crease ties humanity's search for precision to the history of nations and of ideas. Any measurement must be based on a "standard" that embodies a unit, such as a foot, a finger or a hand. Eventually standards came to be inscribed in stone or metal and stored in protected areas such as the Acropolis for the Greeks, and in later centuries in Paris and Washington DC. Ownership of the standard symbolised political and social power.

These standards had a financial value too: copies of them were used in commerce. Not only that, the new machinery that fed the industrial revolution's boom relied on interchangeable parts, which required high degrees of accuracy and uniformity in measurement.

Turbulent political times had their impact too. Eager to establish a new national identity,

in the late 1700s the leaders of the French Revolution moved to sweep away all vestiges of the old system, including its weights and measures. The metric system was born.

It spread slowly across Europe. The UK was the prominent holdout, stubbornly hanging on to imperial units: as the premier industrial nation it made no sense to replace perfectly functional machinery for the sake of a new measurement system. The US kept the British imperial system, although scientifically minded presidents such as Thomas Jefferson urged otherwise.

The imperial system is still used to measure snow in the Nevada desert

But one thing still missing was a "natural standard" that associated a length measurement with a property of nature. In the 1870s, US logician Charles Sanders Peirce made the key suggestion: link the metre to the wavelength of a spectral line. This way, the standard metre could be reproduced anywhere.

Crease takes us through the maze that led to today's scientific measuring system, the SI system – *Système International d'Unités* – which extends the metric system to include electricity, magnetism and time, and whose standards are natural constants, such as the speed of light.

The metric system won out for science. Although for things like speed limits and consumer goods the UK and US still use their own systems, converting to the metric system is routine – if you remember to do it. I was surprised that Crease made no mention of the 1999 Mars rover mission, which failed when the craft burned up in the Martian atmosphere because American engineers neglected to make an essential conversion. And also that he left out the 1884 convention in Washington DC that standardised time zones. But these are quibbles with an otherwise fascinating book. n



CHRIS CARROLL/CORBIS

## Drawing inspiration

*Da Vinci's Ghost* by Toby Lester, Profile Books/Free Press, £16.99/\$26.99

Reviewed by Jamie Condliffe



LEONARDO DA VINCI'S *Vitruvian Man* is the most widely recognised drawing on the planet. A study of human form and proportion,

the iconic depiction of a man standing with arms outstretched,

framed by circle and square, has come to epitomise the notion of imitation as the sincerest form of flattery: it has been used by Disney, appeared on Euro coins, and even been parodied on *The Simpsons*.

But the image wasn't a product of imagination alone. In his new book, *Da Vinci's Ghost*, Toby Lester uncovers its long and intricate history, revealing that da Vinci was in the business of imitation himself. Indeed, the drawing built on the idea that the human form was a precisely proportioned

structure representing the measure of all things – a philosophy developed by the Roman architect Vitruvius during the rule of Caesar Augustus.

As Lester shows, for the original Renaissance man, this idea had tremendous appeal. Skilfully tracing da Vinci's early talent for art through his passions for architecture, engineering and –

**“The drawing wasn't a product of imagination; da Vinci was in the business of imitation himself”**

crucially – human anatomy, Lester makes the case that it was this fusion of interests, and a chance encounter with a translated copy of Vitruvius's work, which culminated in the creation of the *Vitruvian Man*.

He weaves a sparkling account of da Vinci's personal life with an intriguing history of studies of the human form. So entwined are these narratives that he speculates on a tantalising theory: that *Vitruvian Man* was a self-portrait. It is a fine revelation on which to round off a fascinating book. n