

# Tipping the Scales



ANDREW STEELE TAKES THE MEASURE OF MAN'S QUEST TO QUANTIFY.

**M**ANKIND has invented some incredible scales—what better unit of volume can there be than the pint?—but we've had our dark moments, measurement-wise, too. From wind speed to chilli spiciness, nothing seems to escape the human desire to quantify. Where did it all go wrong?

The Beaufort scale, brainchild of nineteenth-century rear-admiral Francis Beaufort, was designed to allow Royal Navy sailors to distinguish the winds on the high seas. These ranged considerably, from 'just sufficient to give steerage way' to that 'to which she should show no canvas'. Beaufort devised a scale, based on wave height, foaminess and levels of spray, which assigned a number between zero and twelve to the prevailing conditions, so that sailors could show or stow the sails accordingly.

It was 1906 when the ship, so to speak, hit the fan: Met Office head George Simpson adapted Beaufort's maritime scale for landlubbers. It ranges from zero—the classic 'smoke rises vertically'—through 'leaves rustle' at two, with 'umbrella use becoming difficult' at six, 'damage to circus tents' at nine, and finally 'considerable and widespread damage' up at force twelve.

So a Beaufort-Simpson anemometer would need a chimney, a leafy tree, an umbrella and a big top for even basic functionality—making it the size of a small field. Mmm...portable.

A similarly idiotic scale exists for earthquakes—the modified Mercalli scale runs, Beaufort-like, from one to twelve (but, bizarrely, in Roman numerals). Where a traditional seismometer is a pen on a stick, a Mercalli seismometer looks more like... well, Tokyo.

So, at 'quake time, what should you look for? Well, by iv (moderate), dishes and windows will 'rattle alarmingly'; a vii (very strong) will damage chimneys in

your Mercalli seismometer (the smoke will long since have ceased to rise vertically); a x (disastrous) will bend rails; and a xii (catastrophic) would be hard to miss—'almost everything is destroyed'. There's no mention of brollies—though presumably umbrella use becomes pretty difficult in a magnitude vi or vii earthquake.

If the Mercalli trumps the Beaufort in devastation then the Torino scale must be the daddy of death and destruction. You take an asteroid, calculate its probability of hitting Earth and the likely subsequent damage, then nonchalantly assign it a number from zero to ten. A zero is a certain miss; a ten has a greater than 99% chance of impact and would cause a blast the size of eight million Hiroshima nukes—making Beaufort's ten ('asphalt shingles in poor condition peel off roofs') look cute.

**"Umbrella use becomes pretty difficult in a magnitude VI or VII earthquake."**

If the destruction of humanity isn't to your taste, then perhaps you'll prefer the Scoville scale. Liquid chromatography is used to measure a chilli's levels of capsaicinoids, the chemicals responsible for its spiciness, before chalking up a grade between one and...wait for it...sixteen million. It's hard to probe the outer reaches of the Scoville scale at your local curry house: those deadly jalapeño peppers barely hit 10,000. The hottest chilli on record clocks up over 1,000,000—handling it requires gloves and eating one would send you vomiting all the way to A&E. Strong pepper spray hits five million, and only pure capsaicin reaches the full sixteen million Scoville units—eating two or three grams could be lethal.

What could be harder than eating a million-point chilli? The Mohs scale of mineral hardness, of course. In 1812,

Friedrich Mohs must've thought for at least eight seconds before coming up with his genius idea—to find out how hard something is, why not scratch it against something else? Maybe because you don't want a huge scratch down the middle of the sparkling, iridescent, sublimely beautiful gemstone you've just found? If that's not a problem, whip out your Mohs hardness-ometer, a box of ten minerals from softie talc (one point) to rock-'ard diamond (ten points), and try scraping each one across your test mineral. Your sample scratches all those below it on the Mohs scale, but is scratched by those above.

Mohs' main failure was lack of originality. Why limit yourself to rocks? Everyday objects provide myriad possibilities: 'Well, Dad, these car keys are softer than the double glazing but harder than the paintwork on your Volvo.'

So, history has tried pretty hard, but no-one has yet developed a scale which scores the full ten on Steele's Stupid Scale Scale: a scale so monumentally ridiculous that it would wipe out humankind.

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