Warm up

Definitions for the purist

P McCrory

WHAT IS A SECOND?

Since 1967, the international standard for a second has been defined as the time it takes for 9 192 631 770 oscillations of the microwave radiation corresponding to the transition between two hyperfine levels of the ground state of an atom of celsium-133. It sounds complex and an extremely accura method for measuring time althoug more recent proposal using a ytte bium standard is superior by a factor more than a hundred times.

WHAT IS A METRE?

The origins of the metre go back to late 18th century. At t t time, there wer two competing p posals for how to define a standard unit of l ure metre. Th tronomer Christian Huygens su ested the metre be defined by t length dulum having a perio of e second; others fav red a meti efined as one tenmi. the leng of the earth's meridian al g a quadr t (one fourth the circumf nce of the rth). In 1791, the Frenc Sciences endorsed the eridian definition because the force gravity varies slightly over the surface of e earth, affecting the period of a pendu . On 22 June 1799, the French Academy Archives adopted its standard metre, recorded on a platinum bar. The French, however, miscalculated the flattening of the earth due to its rotation in their quad calcula ns. As a result, the metre in A ives is 0.2 millimetres shorter th one ten-millionth of quadrant of the earth.

French government made the metre compulsory standard of measure in 0. The Treaty of the Metre was signed in 1875, and in 1889 a platinum-iridium bar was established s the International Prototype Metre. In 960, the General Conference on Weights and Measures redefined the metre in terms of the number of waves of a very precise colour (wavelength) of light emitted by krypton 86 atoms. In 1983, the conference discarded the krypton standard and redefined the metre in terms of the speed of light. The metre is now officially 1/ 299 792 458 the distance travelled by light in a vacuum in one second.

WHAT IS REACTION TIME?

Reaction time is the time that elapses between the moment a stimulus is detected by the brain and the moment a response starts. Studies have shown that nobody can react in less than 0.110 of a second.

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Retraction: Definitions for the purist

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Scientific American, ask the experts. http://www.weizmann.ac.il/sci-tea/physics/sciam.html#q8

We would like to acknowledge the preliminary work of Nick Brown in investigating publications by Dr Paul McCrory and thank him for bringing these concerns to our attention.

During 2021 and 2022 there was an investigation by *British Journal of Sports Medicine* and BMJ which found that some of McCrory's work was the product of publication misconduct. *British Journal of Sports Medicine* published a summary of the investigation.[1]

References

1. Update on the investigation into the publication record of former BJSM editor-in-chief Paul McCrory *Br J Sports Med* doi: 10.1136/bjsports-2022-106408

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