

The word *science* actually is the Latin word *scientia*, meaning *knowledge*. But you never really know for sure, do you? There's always some uncertainty.

If we toss a coin, it yields either heads or tails and both have a probability of 1 : 2. If you toss 10 times and *all* are heads, you probably no longer believe it is a fair coin, do you? You will say that *it **always** shows heads, so it is not a fair coin*. But the probability of tossing a series of 10 heads is  $1 : 2^{10} = 1 : 1024$ , say one in thousand, which is the uncertainty in your statement about the coin. Your declaration might still be wrong.

The same applies if you pick up a stone and release it. It will either fall or not. You repeat that action 10 times with the same stone and it appears to fall every time. You don't believe it is a fluke and say that *the stone will **always** fall if you pick it up and release it*. This proposition also has an uncertainty of one in thousand, just as for the tossed coin.

Now we do that same experiment with 10 different stones, and all yield the same result that the stone falls every time. We then state that ***every** stone will **always** fall if you pick it up and release it*. We performed the pick-and-release action 100 times in total, so now the uncertainty equals  $1 : 2^{100} = 1 : 1\,267\,650\,600\,228\,229\,401\,496\,703\,205\,376 \approx 1 : 10^{30}$  or *one in a nonillion* or *one in a quadrillion quadrillion* (Dutch: *één op kwintiljoen*). This uncertainty is not zero, but do **you** have any doubt that ***every** stone will **always** fall if you pick it up and release it?*

The earth's radius is 6371 km, so its surface area is  $4\pi r^2 \approx 500$  million km squared =  $5 \times 10^{14}$  (500 trillion, Dutch: 500 biljoen) metres squared. It happens to be that every

year, about 500 meteorites reach the earth's surface<sup>[1]</sup>. Let's "round" this down to 365, yielding one meteorite impact per day somewhere on the earth (71% will be in the ocean).

The circumference of a human skull is, on average, about 58 cm<sup>[2]</sup>. Presuming it circular, it yields an average surface area of the human skull cap of 0.027 m<sup>2</sup>. The surface of the earth is nearly  $2 \times 10^{16} = 20$  quadrillion (Dutch: 20 biljard) times larger than the top of your head.

This means the probability that you will get a *meteorite impact right on your head* within the next 24 hours equals merely one in 20 quadrillion (Dutch: één op 20 biljard). Per year it approaches one in  $5.5 \times 10^{13} =$  one in 55 trillion (Dutch: één op 55 biljoen) and during the worldwide average life expectancy about one in 750 billion (Dutch: één op 750 miljard). Are you afraid of being directly hit by a meteorite? Most people aren't.

The uncertainty in the proposition that *every stone will always fall if you pick it up and release it* is roughly  $10^{18} = 1$  quintillion (Dutch: 1 triljoen) times *smaller* than the probability of such a definitely dangerous damn dreadful deadly disasterous disturbing destructive depressive deposition disappointingly destroying daily discipline.

The laws of nature as we know them have been concluded from very frequently occurring phenomena. Way more frequent than merely 100 stone drops as mentioned above. You never know for sure? Come on!

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<sup>1</sup> see [https://en.wikipedia.org/wiki/Impact\\_event](https://en.wikipedia.org/wiki/Impact_event)

<sup>2</sup> see <https://www.headict.nl/blog/hoofdomtrek-meten-vind-de-juiste-hoedmaat-n858>