A marathon is an obscure definition of distance that course measurers strive to pin down to the tarmac. By the book, a count of the strides taken was also the difficulty of keeping such mountainous terrain. There, despite the difficulties of forbidden Himalayan lands, by the 19th Century Indian route, we take to cover any chosen route, constant by the number of strides, the known, accurately-measured length of road to 'calibrate' the bike's wheel with counter readings, and then ride the road race course from start to finish. As the 'calibration' gives a number of counts per metre, the total counts for the road race course can easily be converted into metres to determine its length.

Using a bicycle has two other distinct advantages. Provided we sit steady in the saddle, we have a constant weight on the front (see illustration from book, right) which maintains good road contact. It is almost impossible to do this with a surveyor's wheel. Secondly, a bicycle can be ridden along the "shortest possible route" that a runner can take along the course. Runners are free to cut tangents across the road to avoid running further than necessary; they can hug the kerbs at corners.

A bike can reproduce this ideal running line [see picture, above, and illustration from book, bottom of page 30] so that it is impossible for any runner to have run a shorter course than that measured. Even the 'blue line' used for many marathons is only an indication of this shortest possible route - the equipment used to paint it on the road can't take the corners as clung. As a runner might, or a bike-borne measurer certainly will.

Using a mechanical counter also has two great advantages. As the normal wheel circumference is about 2.2m each 'count' registers about 9cm to 11 cm of road length. Electronic counters are 100 times less sensitive, registering only every 10m. Secondly, mechanical counters retract when the bike is wheeled backwards while electronic counters do not distinguish between forwards and backwards movement.

Despite the existence of this highly accurate and convenient 'calibrated bicycle' method of measurement, other inferior methods long continued in use. Derek Clayton's world marathon record in 1969 was set on a course officially measured using a car odometer, and subject to dispute ever since.

But if you ask the question point-blank: "How long was that course I just ran?", no one can give you an exact answer. There is no such thing as a perfect measurement. Any measurement is subject to some error.

If we know what the error is, we can say that the distance measured is within a definite range: not less than x metres and not more than y metres. The error of the calibrated bicycle method is 1 in 1000, or 1m for every kilometre.

It is the x value that is of interest to us as runners. We don't want anyone to be able to suggest that our time could be unduly flattering because we didn't actually run quite as far as advertised. So 42.195m should be the minimum we could have run. Yet if our error is on the side of under-estimation of what is measured, we could have only run 42.133 - 0.1% less than 42.195m. To avoid this we factor in the error, effectively measuring out each kilometre as 1001m.

This way, by the time you get to the finish line, you know that you have just run at least a marathon.

* The Measurement of Road Race Courses is an instructional manual. If you are interested in becoming a course measurer, please contact the Editor.