

T. If you have the gram at the tips of your fingers, you have not yet got the grains, at the same place.

JACK. No, but we are feeling for them.

T. Very good. How many large wheat, barley, or rice grains would make a bulk as big as the "gram top" of your finger, would you guess?

S. Ten, fifteen, twenty!

T. Not so bad. Your average guesses are pretty nearly correct. Now if you imagine the gram top of your finger to be broken into grains, there would be about fifteen grain fragments. I am now going to give you an imaginary ring to bind all these fragments into an exact gram weight. This imaginary ring is a magic ring, for it will bring to your mind the long decimal number exactly. How many are ready to put this ring on their fingers?

(All hands up).

T. Well, the ring is made up of numbers, a set of five numbers, all in order—just as many as the hand has fingers. Who can guess what the figures may be?

S. I suppose, 1, 2, 3, 4, 5,—that is the simplest set of five figures one can think of.

T. Very good. Imagine that row of figures to be made into a ring about your finger. Which figures would we have to solder together?

S. The 1 and the 5, thus: 
$$\begin{array}{c} 3 \\ 2 \quad 4 \\ 1 \quad 5 \end{array}$$

T. Very well. The 1 and 5 soldered together will make a 15, the others may be straightened out as the decimal fraction. How many grains in one gram now?

S. 15.432.

T. Correct to three decimal places. You can easily remember it, because the numbers are 5 4 3 2 1, with the last figure brought around to touch the first, and the two touching figures make the whole number. How can you find the number of grams in our ordinary pound?

S. 1 lb. = 7,000 grains. But every 15.432 grains = 1 gram.  $\therefore 7,000 \div 15.432 =$  number of grams in 1 lb. = 453.6029 grains.

T. Correct. I will lastly give you the second and last number to commit to memory—and that is all the memory work necessary. One meter is equal to 39.37 inches. For rough estimates we may count the meter as nearly equal to 40 inches; but exactly it is—

S. 39.37 inches.

T. The 39 is so nearly like the 37 that I hardly think any one can forget it. Try if you can. But you cannot. Find how many meters in a mile.

S. A mile equal to 1,760 yards, multiplied by 3, = 5,280 feet. Multiplied by 12, = 63,360 inches. But every 39.37 inches is one meter. Therefore  $63,360 \div 39.37 =$  number of meters in a mile, = 1609.34 metres.

T. Correct. These two facts, then, we must always remember, if we are to be independent of tables; 15.432 grains = 1 gram, and 39.37 inches = 1 meter. We shall have some exercises in a future lesson.

### Astronomical Notes.

#### THE MOON AND THE WEATHER.

"If Christmas comes during a waxing moon we shall have a very good year, and the nearer to the new moon the better; but if during the waning moon a hard year, and the nearer the end of the moon so much the worse."

That's one of the good old-fashioned bits of moon-weather wisdom. If it is true, this year will be a "very good" year, but yet not one of the very best; for, although Christmas came during a waxing moon the waxing was nearly all done—full moon occurring just two hours (60° time) after midnight on Christmas last.

What basis of fact this weather saw may have to rest on I don't know. If it is like a good many others of its kind, it probably owes its existence to what somebody said were the results of what somebody else thought were the observations which some other body was supposed to have made at some time or other.

Here is another, which seems to be propped by some facts. I take it, as I did the first, from a three-year old article in Longman's magazine:

"One of the most curious, and certainly one of the most widespread, of all weather beliefs is that of the Saturday moon. The notion is that when the new moon falls on a Saturday it is invariably followed by a period of wet and unsettled weather. The currency of this belief is remarkably wide. Not only is it found (more or less modified) in the folk lore of England, Scotland, and Ireland, but it is held also by seamen of all nationalities. A traveller relates that he once heard it referred to by a Chinese pilot. And more than this, in 1848, a Dr. Forster announced to the Royal Astronomical Society, as the result of an examination of weather registers kept by his grandfather, his father, and himself, extending over nearly eighty years, that nineteen times out of twenty a new moon on Saturday was followed by twenty days of rain and wind. It is not many weather sayings that enjoy the supporting testimony of a solar scientific investigation, and that circumstance, together with the general acceptance in which the saying is held, entitles it to 'special consideration.' The writer proceeds to give it 'special consideration,' and then winds up with, 'We are obliged to include this much-respected saying in the category of idle superstitions.'"

It happens that the moon of this present month of January, 1891, is a "Saturday moon." It will be a "Saturday moon" all over the earth, except just for the strip lying between 130° and 180° east longitude—there it will be a "Sunday moon." The astro-