MUCH ADO ABOUT NOTHING – PART 1

The Importance of Zero

For the first few thousand years of human civilisation, there was no concept of zero.

Numbers started to be used for practical things – counting in trade or control of civilisations.

The most primitive setting of numbers initially represented what was being counted. eg. A stick figure of a person meant people were being counted; a picture of a sheaf of wheat meant that sheaves of wheat were being counted; an outline of a sheep meant that sheep were being counted.

One of these symbols represented one of that type. Two of these represented two of that type, etc.

Representation in this way worked but it was quite cumbersome to draw these symbols multiple times and more than a very few of these not only becomes tiresome but also takes up a lot of space on whatever medium they had on which to represent their number: perhaps a stone or clay tablet if they wanted to keep the number, or clay or sand for temporary calculations.

It did not take long to get much more efficient in representing these numbers. They started using a vertical or horizontal mark instead of the picture, with what was being counted being separately explicitly or implicitly noted. So using vertical strokes | meant one, || meant two, ||| meant three, etc.

Again, when the number got more than three or four it was difficult to count the number of strokes. As a result, most civilizations developed symbols to represent different numbers. Taking the well-known Roman numeral system (a numeral is a representation of a number):

I represents one, II represents two, and III represents three.

To represent multiples, other letters of the Latin alphabet are designated:

V for 5
X for 10
L for 50
C for 100
D for 500
M for 1000

And that was a far as they went. After all, who would be interested in numbers more than a few thousand?

To represent eleven, you just use the symbol for ten (X) followed by one (I), becoming XI. Other numbers are represented by putting two or more of these symbols together, so thirteen is represented as XIII (ten plus one plus one plus one).

Another refinement is that if a symbol for a lower number precedes one for a larger number, that is subtracted from the total (usually only one of these is used at a time). So IV represents five less one. In other words, IV represents

four. Similarly, XIX represents nineteen [ten plus (ten less one)]. XL represents forty (fifty less ten). So what we write as 3978 becomes MMMCMLXXVIII [three thousand plus (one thousand less one hundred) plus fifty plus ten plus ten]. No wonder mathematics was not the Romans' strong suit.

Most numbering systems were based on tens, mainly because we have 10 fingers (digit comes from the Latin name for finger). However, other systems use different bases as we shall see next week, along with the discovery of the place system and the introduction of zero.

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