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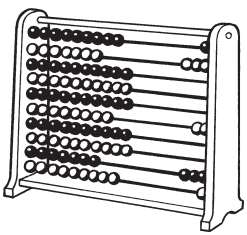
Prehistoric Maths



Back to the Beginning

It has been estimated that the earliest humans arose in Africa approximately 250,000 years ago. These people left behind little evidence of their existence other than a few fossils, so we know very little about their culture, if indeed they had one.

So, what can we say about their mathematical abilities?

Early estimates

A trait that all humans – and indeed primates and some other animals – have is the ability to **subitize**: to know at a glance how much a small number of things amounts to. Here is an example:

III

If you have the ability to subitize, you will be able to look quickly at the lines above and spot that there are three of them, without having to count each line. Now try this one:

IIIIIIIIIIIIIIIIIIIIIII

There are twenty-three lines here, but I only know that because I typed them. At a glance, the best you would probably be able to do is to say that there are 'around twenty' or 'two dozen' lines. The instantly recognizable and countable pips on a die are a modern-day example of subitizing.

We think that subitizing is a trait that has evolved in animals to allow them to make quick decisions with regard to fight-or-flight-type situations: one or two wild dogs and you might be happy to stand your ground (as long as there's a stick nearby that you can use to fend them off); three or more dogs and you're likely to run to the nearest tree.

You and I are literate and numerate humans who can't remember what it was like not to be able to count. We see three lines and we cannot help but think of the number three. Our first ancestors, however, would have had no word for three and, perhaps more significantly, possibly no concept of three as a number.

The Stone Age

Approximately 200,000 (notice the comma to help you subitize all those zeros!) years after they first walked this earth, humans gained what anthropologists call 'behavioural modernity': they started doing things that differentiated them from other animals. They developed language, tools, cooking, make-believe, painting, and had begun to ponder the nature of existence and all the other things that make us human. These were the Stone Age hunter-gatherers. We know a touch more about their mathematics because the remains of cavemen types were unearthed from the nineteenth century onwards and written about by their pith-helmeted discoverers.

A counting controversy

The Ishango bone is the thighbone of a baboon that was discovered in the Democratic Republic of the Congo, Africa, in 1960. Dated at approximately 20,000 years old, the bone has caused much controversy among scientists. The bone has three sets of grooves carved deliberately into it, and if you count the grooves you find the following sequences: (9, 19, 21, 11), (19, 17, 13, 11) and (7, 5, 5, 10, 8, 4, 6, 3). Some scientists believe that this is evidence not only of the Stone Age peoples' ability to count up to numbers much higher than the more recent Aboriginal tribes (well, higher than three anyway; see box on page 12), but that the numbers in each set shows evidence of an understanding of counting in tens, odd numbers and prime numbers. This argument has been challenged by other

scientists who suggest the grooves were either decorative or intended to make the smooth bone easier to grip, and therefore mathematically meaningless.

Modern-Day Hunter-Gatherer Tribes

The Pirahã tribe lives today in the Amazon rainforest. They are consummate experts at jungle survival. The tribe's language is so simple that its hunters use a whistled version of it while out trailing game. Remarkably (at least to us), their language contains no numbers and, despite trading commodities such as T-shirts, metal knives and alcohol with other tribes and river traders, the Pirahã show no inclination to adopt a number system either. These people live in such a way that numbers have no function for them – they live hand to mouth in the equatorial rainforest, where food is available all year round.

Australian Aboriginal tribes were living in a hunter-gatherer society when they were first encountered during the eighteenth century. The tribes that possessed a concept of numbers generally had words for one, two and sometimes three. Any numbers larger than three they made by adding together a combination of the first three numbers. So a tribe with words for one, two and three would have been able to count to nine by saying: one, two, three, three-one, three-two, three-three, three-three-one, three-three-two, three-three-three. The fact that these people had no word for numbers larger than three suggests that they very rarely, if ever, needed to use them.