The numbers we first thought of

A basic thesis of my book *Sacred Number* was that,

> The Stone Age peoples, through observing the celestial environment (the sky), and how it is time-structured numerically, came to understand the structure of number itself as a cosmic principle that was central to the Creation.

This was the path whereby the Stone Age became the megalithic culture that clearly used large stones in meaningful ways to capture celestial events and express numerical relationships important to this worldview.

Some of the effective techniques, including right angled triangles and counting techniques, developed in the megalithic have been demonstrated in earlier chapters and these techniques often leave their own records in the organisation of the megaliths themselves - their alignments and the distances between them. This means that whilst we today take notes of our measurements with pen, paper and our number notation system, the megalithic specialists might have had less need for a system of notation apart from the objects of measurement themselves.

However, it is almost certain that they did develop notation systems, especially with regard to the recording and manipulation of the large numbers of feet, cubits, steps, yards, miles of whatever type required to, for instance, achieve angular measures and trigonometrical functions, without the type of equipment or analytical algebra we have today. We don’t have to re-invent modern systems of mathematics so that the megalith builders can do what they did – and people who try strain credibility and their theories are roundly rejected. But there does have to be a way for ancient science to achieve what it did.

Even the way we write number down today, in decimal notation, is effectively a sophisticated piece of equipment and the way this evolved within the historical period is perhaps indicative of a prehistoric system of notation that, like so many other elements of our culture, was inherited but is a distorted form relative to the original version.

The Primacy of Prime Numbers

In my own work with numbers, especially in studying Michell and Neal's ancient metrology, I soon evolved the technique of reducing measures (in feet) to their prime number content. I was driven to this because it was the only way I could know what was really contained within a measure that would enable it to be transformed into another measure or divide into a longer reference length, exactly.

> Prime numbers only divide into themselves and this means they are incommensurate with respect to any other number. Since both a length and a measure are made up of prime numbers, the primes each contains have to match to obtain a whole number of measures within the length. Obviously 1000 yards will be commensurate with the yard or foot. But with a length such as the length of a degree of latitude, the measure has to be suitably transformed to match the primes present in that length.
>
> In modern science it would be impossible to measure a length in nature and expect a rational solution in feet. However, this is where one of the prehistoric notational systems comes into play. The reference length is *rationalised* so that it will divide by a rational foot, whilst keeping the result within the margins of error present in the measurement itself. This is done according to a canon of significance given to the early prime numbers within metrology. In the case of the *Ancient Model of the World* [Michell, AM, 1982], the result is highly accurate relative to our present day definition of the Earth, certainly good enough for prehistoric man, and yet superior in being easy to use and remember.

> We should remember that the length of four degrees of latitude are rationally presented in the Great Pyramid as its four different side lengths, corresponding to four of the degrees within the Unified Kingdom [Neal, ADWM, 2000].

Instead, we look at numbers today through highly specific "glasses" made up of just two prime numbers, 2 and 5. These together give us the base of our decimal number system, 10. This is powerful and, combined with zero and a positional notation system, it becomes a power tool for our scientific and technological culture.

However, why not use all the primes to notate numbers? There are benefits and limitations in retaining prime numbers. One such is that the true content is revealed as in the case of 5/3 which we would write as 1.6666 where the fractional part goes on for ever. The decimal system has bypassed 3 when choosing 2 and 5 as its basis and so it cannot deal properly with the result of division by three. The Sumerians and Babylonians used a base 60 to, amongst other considerations, incorporate 3 within their base system. However, having 60 marks or composite marks, instead of just 10 [0 to 9], introduces its own problems.

A decimal system of notation or even a sexidecimal like the Babylonians is very unlikely because its notation is extensive and does not pay heed to a system of low primes including 7 and 11 evidently in use by the megalithic builders, a system that needed to reduce the need for notation to its absolute minimum, and which could easily be committed to memory. If the inner constitution of numbers was part and parcel of their world view, then the decimal system would never have developed.

But can the development of our decimal system from various historical notational systems and alphabets, reveal an original, prehistoric system?

The Historical Origins of Number

There are two main streams of notation that emerged from the Indo-European migrations to the south.

a. The first was the language of the Phoenicians who, arriving at the eastern Mediterranean basin, with ships, already had or soon created the basis of modern European alphabet. This, like most early historical scripts, allocated to the same symbols a numerical value, each symbol representing a number and therefore words having a numerical as well as a literal meaning. From this came the two well-known "cabbalistic" languages, Hebrew and Greek. Such languages naturally evolved what is called Gematria in which the numerical content lying behind sacred texts could stand as a revelatory medium and also, probably, as a mechanism of self-correction in which an initiate could restore any errors of transcription that might creep into a literary work. The main point to note here however is just that letters were originally also numbers.
b. A second historical source comes from India where the Brahmi language has been found, in the early historical period, to have evolved into our modern types of numeral, transmitted naturally to Europe through Islamic diffusion. It displayed numbers in a positional notation, using 0 to 9 and powers of ten.

So, whilst the Mesopotamians had evolved a base-60 arithmetic, this was unwieldy except for specialist use and it is then necessary to eliminate one of the primes, leading naturally to base-10. One could have base 30 but this would still be an obstacle to widespread use. We have to employ primes to get maximum value out of the base we use and a base of 6, eliminating 5, obviously was not a starter as it is small and after all we have ten fingers and thumbs, two times five, both suitable primes.

The popularisation of notation out of specialist use is at the same time a loss of focus on the sacred use of numbers and a movement into secretive hidden employment within which texts can have gematriacal and musical content, exactly as is found in the sacred texts that appear in the earliest historical period [McClain, *Myth of Invariance*,].

The question asked here must be what came before? If all of the behaviour of numbers is determined by the primes they contain, then any base system we employ acts as a filter for just some numerical realities and will obscure any other behaviour determined by those primes not included in the base.

What if the ancient proto-culture understood this and for their notation chose to represent, *instead of using a base notation*, the primes contained within a number, as this is then the *irreducible essence* of a number rather than just a sign notating it. How might this work? Would this notation be one of the steps that could have brought the Stone Age to the science so evident in the megalithic heritage?

A Timeline for Numerical Notation

The simplest form of repeated symbol is the Stone Age line. These lines developed naturally into historical forms we see in the Celtic language of Ogham, another Indo-European language using the simplest of all characters made up of composites where lines are placed in different angular relationships, in variations that belong in a number of classes.

So far, then, we have noted:

a. The Phoenician alphabet that was simultaneously phonetic and numerical, and formed the basis for Hebrew and Greek
b. Indian subcontinental languages that introduced the idea of positional notation and added the number zero within a base of ten.

c. Mesopotamian systems that incorporated the three smallest primes, 2, 3 and 5 within a base of 60 to create a highly technical system
d. The Celtic language of Ogham that used an alphabet, currently inscrutable, based upon numbers of single strokes combined within letter glyphs, suitable for incision upon bone, wood and stone and hence as stone age marks.

As mentioned, in studying ancient metrology, I have found the need to reveal the inner workings of number that is the presence of prime numbers that are what numbers are really made of. This arises as necessary when numbers are multiplied or divided since it is the primes that determine the compatibility issues experienced when one number divides into another; an operation brought to the fore when a physical length is divided by the units of length that make up metrology.

There is an implicit canon of thought present in the ancient mind also, that can be found in the system of ancient measures as an artefact of that thought. The whole edifice of this numerical canon is underpinned just by operations involving low prime numbers.

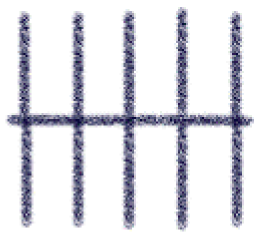
The ancients appear to have, where possible, employed only the first five prime numbers, within their system of metrology, traces of which can be found all over the globe. Therefore, instead of employing a notational system with a base for fewer primes, as we have today, they could have naturally notated the primes themselves. I think they did this for, after showing how such a system could be notated, certain types of calculation become remarkably simple to achieve without additional mathematical processes.

My initial approach to notating primes was to follow the method taught me of representing powers of a number with a little superscripted number. For instance, 441 is $3^2.7^2$ where the dot between means multiplication. In this example just two primes are involved, 3 and 7, both squared, that is to the power of two. Similarly 440 is $2^4.11$ where 2 is raised to the power 4, which means multiplied by itself, four times, resulting in the number 16.

In ancient metrology, the mean radius of the Earth relative to its polar radius is "rationalised" to be exactly the fraction of 441/440 and this can be written as $3^2.7^2$ / $2^4.11$. Using this number ratio, we can now approach a Stone Age notation for it.

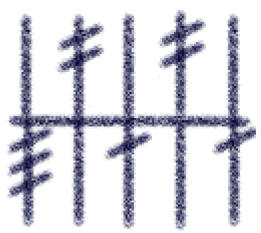
We need to know that, when a number is raised to the power zero, whatever the number is, then the result is the same, it is 1 (one). The first 5 primes of 2, 3, 5, 7 and 11 can therefore be marked, to the power zero equal to one, as

$1 = 2^0.3^0.5^0.7^0.11^0 / 2^0.3^0.5^0.7^0.11^0$:



* 441/440

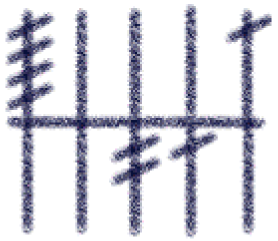
$= 2^0.3^2.5^0.7^2.11^0 / 2^3.3^0.5^1.7^0.11^1$:



This fraction is a very complex number to handle in base-10, in decimal notation it is 1.00227* and multiplying it by another complex fraction without a calculator to do it for you would be tough. (* the underline indicates infinite repeats in base ten of 2727 in the decimal fraction because of the number 11)

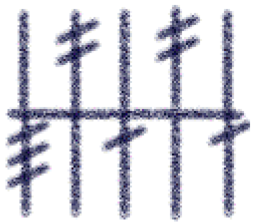
So let's take the other "grid" constant found in ancient metrology,

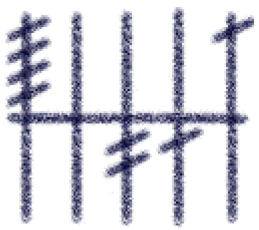
$176/175 = 2^{4}.3^{0}.5^{0}.7^{0}.11^{1}/ 2^{0}.3^{0}.5^{2}.7^{1}.11^{0}$:



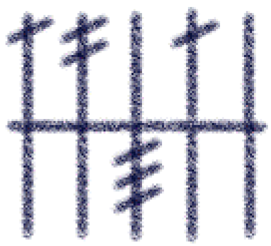
Now we can demonstrate how to multiply these two together to form one of the combined ratios of ancient metrology:

441/440 times 176/175:



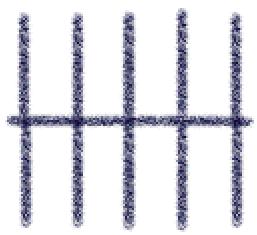


=126/125:

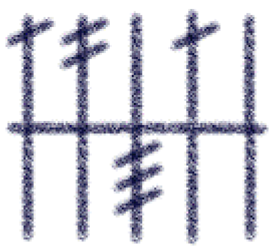


What is happening here is that the whole fractional universe from which ancient metrology is made can be represented and manipulated once such a primal notation is created. In other words this is exactly the best language in which metrology, as we have received it, could have been expressed. It is also suitable for musical harmony.

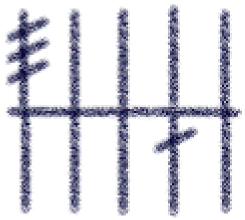
The English Foot functions as the number one in this respect and is therefore:



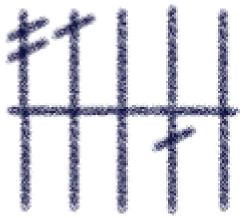
The module to which the English Foot belongs is usually called that of the Greek foot, because most of the feet found historically were found in studying Greek monuments. Therefore, one of the Greek feet is what we just calculated above as 126/125 of the English foot, called within the module the Standard Canonical version (1.008 feet) and it would be notated as above as :



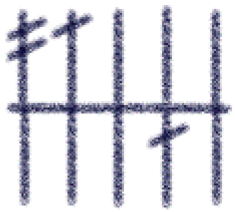
The root feet of ancient metrology are all then simpler fractions of the English foot. The root foot of the royal cubit of 12/7 feet is 8/7 feet long and is therefore:

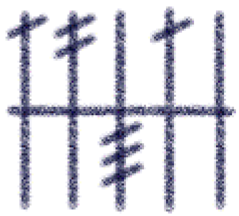


The Royal cubit is then 3/2 of this



And the Standard Canonical variant is this times 126/125 or





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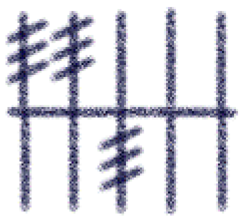
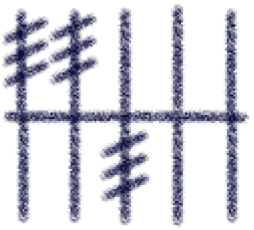
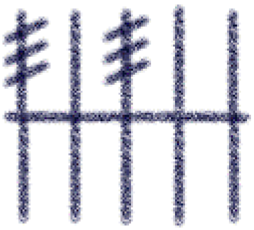


In regular notation this is $2^3.3^3/5^3$ = 1.728 feet. This is known to be one of the most canonical measures, used within the layout of Jerusalem, and when this is multiplied by 1000, the perfect canonical number of 12^3 is generated, as 1728 is twelve cubed:



times



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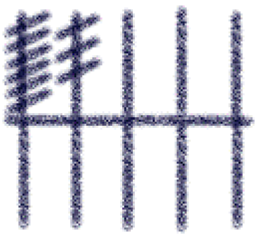
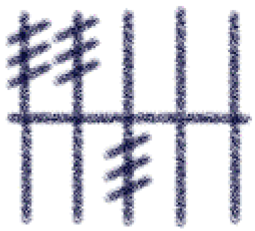


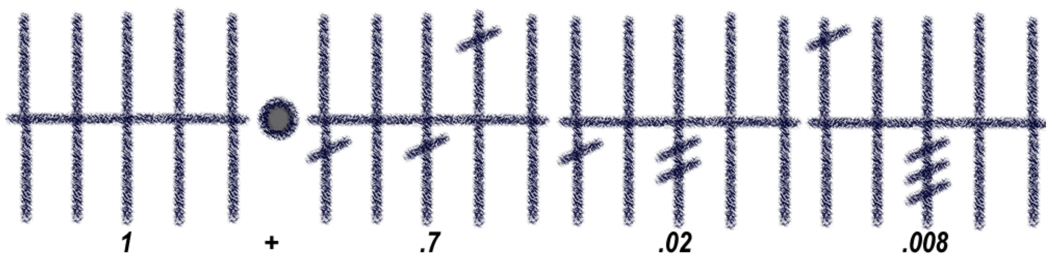
It appears that just as conservation of energy is a guiding principle in the physical world from which much becomes easily understood that otherwise would be obscure, complicated or arbitrary, the conservation of primes within metrology bring a literal rationality to the complexity of metrological calculation. In the case of the Royal cubit of 1.718, one can see from the formula that 1000 of them will make a perfect length equal to just 12 cubed feet. As it happens, using decimal notation, the same is true because the bases of 2 and 5 give the same insight. However, when other primes are required to achieve such a result, our decimal system will provide no such immediate insight though one gets used to removing 3 from numbers that have a fractional part of 0.333 or 0.666 recurring.

Modern day ancient metrologists have generally trained themselves to recognise or test for hidden primes within fractional results but primal notation means that all multiplication, divisions and their results can be seen as to what primes lurk within. By restraining the entry of higher primes the Stone Age metrologists had effectively created a calculator to do the job that metrology seeks to solve, that of being able to relate measures throughout a structure according to a known and intended scheme, thus imposing a *field of rationality* within their work.

This revolutionises the capability of the Megalith builders without their having modern scientific tools and thoughts. Whereas we today look at the standard canonical sacred cubit as being 1.728 feet long, they could have seen it more simply in the base of all the primes involved:



If this is viewed using the same prime notation but with a positional base ten ordering, this would be obscure:



We will see that the creation of an accurate model of the Earth in terms of low primes, the use of low primes in ancient metrology and the presence of low primes within ancient tuning matrices (their natural expression as powers of 2, 3 and 5, sometimes 7), created a vision of the world that could be calculated using primal notation similar to the one proposed here.

