The Astro-Archaeology of Stonehenge

By G.E.S.Curtis

(Retain as pdf, not suited to other formats.)

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Contents

Acknowledgements

I must acknowledge the help of the late Dr. P. Hunt, a very good friend and talented academic mathematician who very kindly checked my calculations.

I was also greatly helped by the talent of another good friend, Jack Lewis, who produced some of the illustrations.

I would like to acknowledge the work of Professor R.J.C.Atkinson who published 'Stonehenge', (Penguin 1979, & 1990) from which the descriptions and measurement details in this current book are obtained.

The construction method and other views expressed in the following pages concerning Stonehenge are my own, and should not be taken to reflect on Professor Atkinson or anyone else.

I must also acknowledge the work of all those astronomers and mathematicians who measured the orbits of the planets, together with that publication known as 'Norton's Star Atlas'.

Introduction

Stonehenge is a supposedly Neolithic monument located on Salisbury plain in Southern England.

A study of the monument ground-plan raises a number of questions that are not answered by existing science. Questions such as: - ‘How could primitive men subdivide a circle into 56 equal parts?’

The questions are not answered with the keys provided by science. We need a ‘dumb-key’ to resolve the problems and answer the questions.

The dumb-key is found by asking ourselves what geometric drawing implements did the builders have? They must have marked the ground with some kind of plan or they would not have known where to dig the holes to place the stones.

The only geometric implements they would have had access to would be the basic ones that men living in the wild might find in the environment.

They would no doubt have a long straight pole or stick to use as a measure, and sharpened pegs to scratch lines in the turf, or to drive into the ground to mark places. They would have rope, or the ancient equivalent, made out of twisted fibres or knotted hide thongs. Pulled tight these would provide a straight line, which could be marked on the ground with chalk dust. (The monument stands on chalk bedrock)

These are the only implements they would have; pegs and string and a stick.

These are our dumb-keys; we must recreate the ground plan of the monument using just pegs, a stick, and string, or with pencil and paper.

Drawing Ground-Plan

Using the Peg and String Method

The peg-and-string method leads to a cluttered drawing when representing it on paper, because the construction lines and marks remain. In practice the monument builders would have simply marked the features they required with chalk dust, or scratches in the turf, and then moved on.

There are two parts to the monument, the outer and the inner. The outer consists of all features that lie outside of the great Sarsen Circle. The inner consists of all those features that lie inside the Sarsen Circle.

The Sarsen Circle itself is part of both, but we will leave it until we do the inner monument.

Although there is good reason to suppose the actual builders started with the inner monument, we will draw the ground plan of the outer monument first.

The Outer Monument

Section one, the 56 Aubrey points in the outer circle.

One obvious question that nobody seems to ask is how primitive Neolithic peoples were supposed to divide a circle into 56 equally spaced points, without the aid of geometry? Apparently they chose the number 56 deliberately, in order to use it as an eclipse predictor, (G. S. Hawkins Stonehenge Decoded - Souvenir Press, London, 1965) so they must have had a reliable way of doing it.

It is impossible to do this simply by pacing it out, and if anyone doubts this, they need only try it for themselves to become convinced.

It is difficult enough even with the aid of modern drawing implements, so it should be impossible for a primitive man.

The geometry I devised and herein describe is a method that could be carried out by men living in a field under reduced circumstances, but they would need to know what to do.

*

It is necessary for the persons drawing the plan to obtain a straight and sturdy stick. I wanted to call this a rod or pole, but both of these terms are already in use and refer to fixed measures.

I shall call the monument measure a 'stick' for want of a better.

The 'stick' can be any convenient length. The drawing method is ratiometric so the length of the stick determines the final size of the monument. There is no need for any calibration marks on the stick, it is just a stick.

*

Items required are the above mentioned stick, a long length of rope or the Neolithic equivalent, a lot of sharp wooden stakes and a bag of chalk dust for marking the ground in the appropriate places.

One of the sharp wooden stakes is to be used to scratch the ground; the others are to be driven into the ground to serve as pegs; so they would need a big stone to use as a hammer.

Clearly, it would be better to do this on paper, and so we shall, using modern drawing equipment like a pencil and an eraser.

You will need to select a 'stick' for yourself. The length of the stick will determine the finished size of the monument.

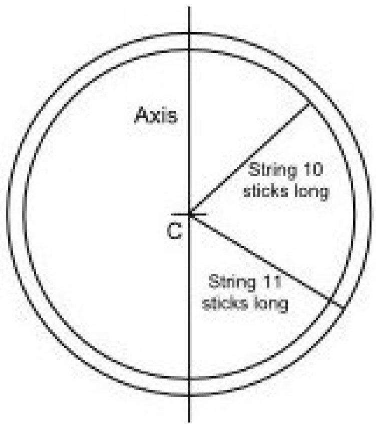
If drawing on A3 size paper a stick of one centimetre would be suitable, but the real monument was built using a stick of approximately 194 inches.

The 56 points of the Aubrey circle (see fig 1).

Step 1) Draw a straight line up and down the centre of a large sheet of paper. In the real thing this would be a line on the grass pointing in a chosen direction. Call this line the 'axis'.

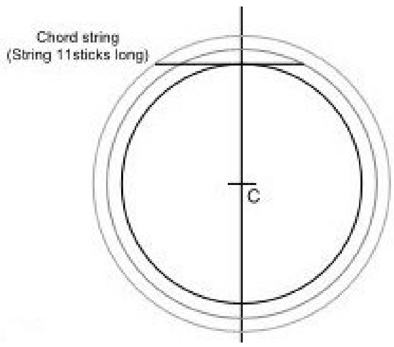
Step 2) Mark a point on the axis line to be used as a centre, (C) roughly in the middle of the page. In reality this would be a large sturdy peg stuck in the ground.

Step 3) Use the stick to produce a string of 10 sticks in length. Use the string, or a set of drawing compasses, to draw a circle of radius ten sticks centred on the chosen central point.

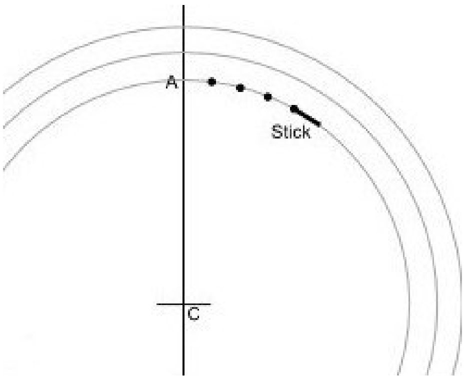


Step 4) Draw another circle 11 sticks in radius on the same centre, as in the small diagram on the left.

Step 5) Using a string 11 sticks long, draw a straight line 11 sticks long starting from any point on the outer circle such that it ends on the inner circle (step 3) and produces a chord on the inner circle.



Step 6) Adjust a length of rope or string to draw a third circle from the same centre (C) such that the circumference is tangent to the line drawn in step 5, as in the small diagram on the left.



Step 7) Starting from a point where the final circle (step 6) crosses the axis line; you should use your stick as a tangent to this inner circle and work your way around the circle marking off successive stick lengths. This should be done as accurately as possible.

It can be calculated that on the full-size monument this procedure produces a circle of 56 equally spaced points, with 4 inches spare on the last point. On the scale of the full monument this is a negligible error, which would not be noticed. On smaller models it only shows up by calculation.

We will refer to this circle as the Aubrey Circle (outer) and the points as Aubrey points.

Note. By calculation the 56 points will fit, but on a small scale it is very tricky to get the points evenly spaced, and it is possible to accumulate errors and get the wrong number of points. I can guarantee it is possible to get it right, and one of my large figures is done by my own hand, just to prove it. Obviously there will be small errors when it is done by hand, but these will not really matter much, just as long as you end up with 56 points evenly spaced.

*

If working in a field, drive sturdy wooden stakes into these points.

These stakes will be dug up later to leave the 56 Aubrey holes, but we will leave them in place until we have completed the ground plan.

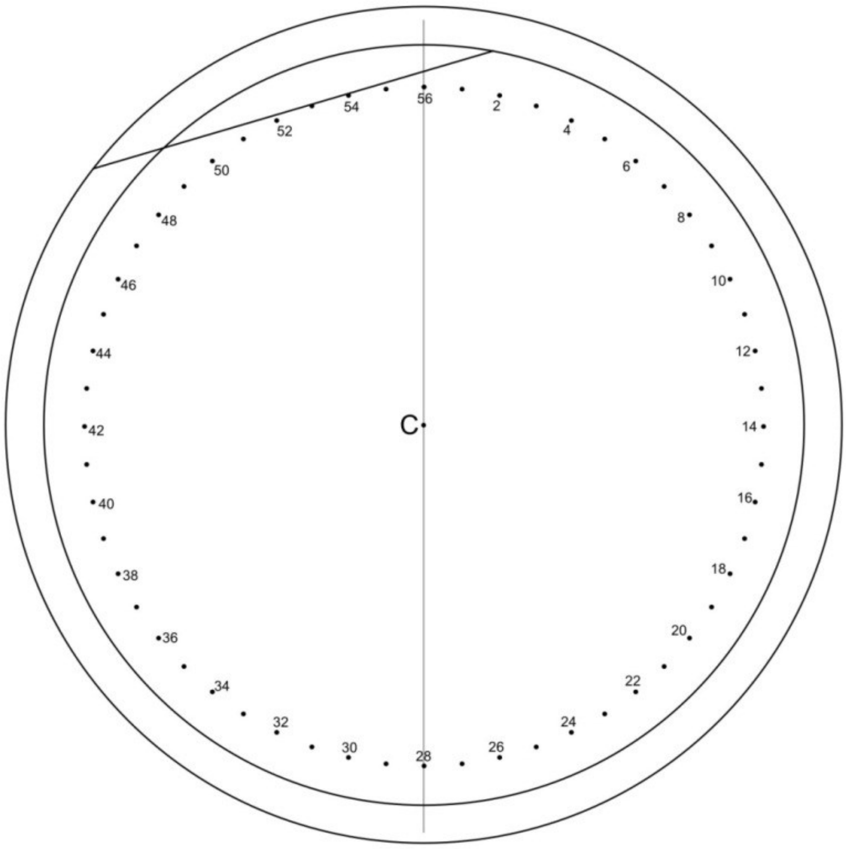
All these steps are marked on fig 1.

If you have successfully constructed this circle of 56 points, then it would be advisable to obtain a few photocopies, because they will be needed again later, and photocopies of the one you have will save doing it over again.

*

The circles of steps 3 & 4 can be used later by the builders as guide lines to correctly place the surrounding bank and ditch. The line in step 5 can now be erased.

It would be useful to number the Aubrey points from 1 to 56, working clockwise around the circle, starting with the first one to the right of the axis line. These numbers are for reference purposes only, and have no other significance.



To start drawing the monument it is necessary to first construct the circle of 56 points, known as the Aubrey Circle.
It will be necessary to do this twice, once for the outer and once for the inner. Although these are to different scales it will be convenient if you photocopy your finished drawing, to save doing it again.

Fig 1 - Construct the Aubrey Circle (See main text)

Section two, the thirty radials.

(see figs 2, 3 & 4)

Archaeologists have noted that one of the main features of the monument is the existence of thirty radials in the mid-section of the monument. The so-called ‘Y’ and ‘Z’ ‘circles’ of holes, and the main Sarsen Circle, all point to the construction of thirty radial lines. Archaeologists do not explain how this could be done by men living under primitive Neolithic conditions.

The method I have devised and outlined below, will work in a field, but could only have been known to someone with knowledge of geometry and mathematics.

There is archaeological evidence in Prof. Atkinson’s book, and on the site, to support the claim that this method was actually used.

*

To produce thirty radials from 56 outer points.

Step 8) Draw a chord across the circle from Aubrey point 2 to point 42 and make a mark where it crosses the axis line. As a check, repeat this for Aubrey point 54 and point 14.

Step 9) The distance between the point marked in step 8 and point 28 on the Aubrey circle is to be taken as the diameter of a new off-centre circle. It will be necessary to bisect this diameter to find a new centre (C2) and radius for this new circle. This can be done with a long length of string; find the radius and hence the centre by folding it in half, or use a compass.

Draw this new circle, on a new centre, but still on the axis line, such as the circumference is a complete circle that passes through the point described in step 8 and point 28 on the Aubrey circle. (As in fig 2).

This circle will be referred to as the ‘vernier’ circle.

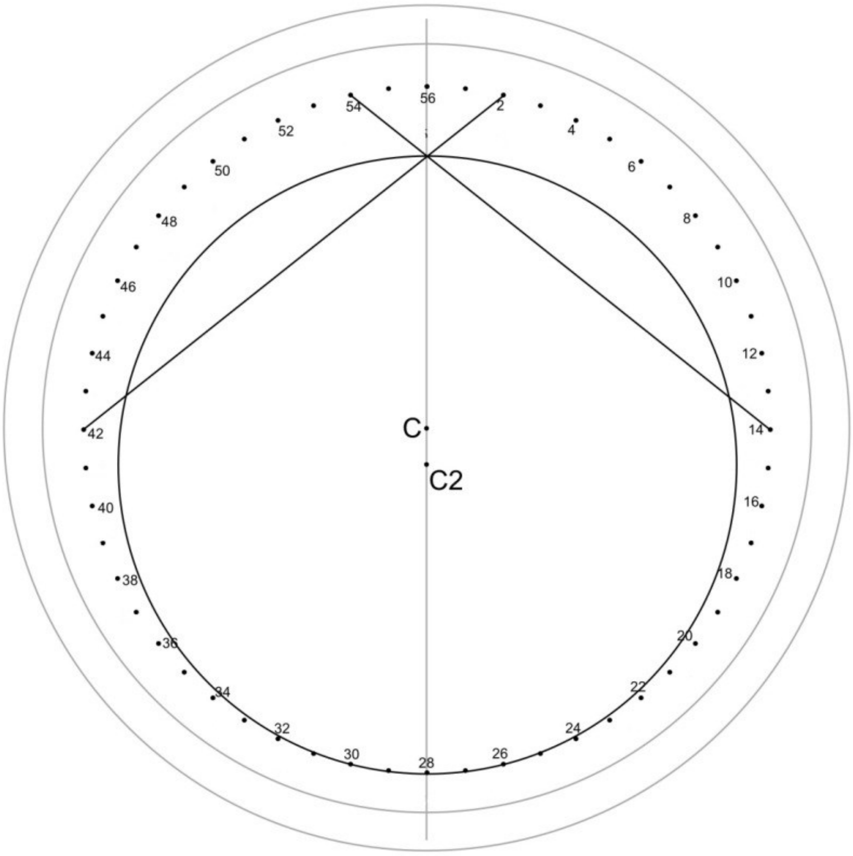


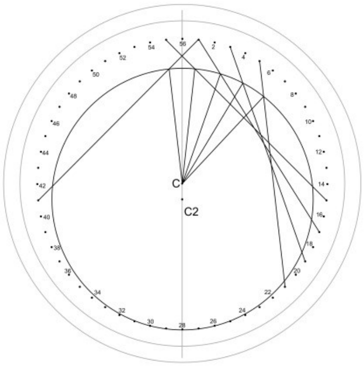
Fig 2 Construct Vernier Circle

Step 10) It is important that this step be understood.

Connect a line from Aubrey 55 to Aubrey 15. This is as a chord spanning 16 segments of the Aubrey Circle.

When I say 'from' I mean start at point 55 and mark the point on the vernier circle where this line first crosses it.

Also mark a section of the middle part of the line, or draw in the whole line as I have done on my figures.



Step 11) Moving the chord line clockwise to Aubrey point 1, connect Aubrey 1 to Aubrey point 17, again spanning 16 Aubrey segments, and again mark where this line first crosses the vernier circle, and mark a section of the middle of the line, or draw in the whole line.

Step 12) Continue this process clockwise, skipping even-numbered Aubrey points. From successive odd numbered Aubrey points, draw chords spanning 16 Aubrey segments, marking only the **first** crossing of the vernier circle, and the central part of the line, until point 27 is reached as a start point.

Complete this chord, and then change to step 13.

Step 13) When Step 12 is complete, repeat the procedure in an anti-clockwise direction, starting with a chord line from Aubrey 1 to Aubrey 41, again spanning 16 Aubrey segments, and again marking where the line **first** crosses the vernier circle, and marking a section of the middle of the line. Continue in this manner, skipping even-numbered points, until Aubrey 29 is reached.

If this procedure was understood and followed accurately, you should end up with thirty points marked on the vernier circle.

Step 14) Connecting each of these 30 vernier points to the original centre, (C) with light lines, will present thirty radials. These should be numbered, for convenience, starting at the first one marked (step 10) to the right of the axis and numbering clockwise from 1 to 30.

Here we should note that if the vernier circle is not drawn accurately, if it is a little on the small side, an error will occur such as will spread the two radials (1 & 30) either side of the axis slightly further apart than the rest of them.

This is an actual feature of the monument, as reported by Professor Atkinson.

(page 38 of 'Stonehenge' the Professor notes that "the two uprights forming the entrance to the circle – no's 1 and 30 – have been deliberately spaced one foot wider than the rest, and the gaps between the adjacent pairs reduced correspondingly.")

I take this as evidence that this method was actually used, and the builders got the vernier circle just a little too small, either accidentally or deliberately.

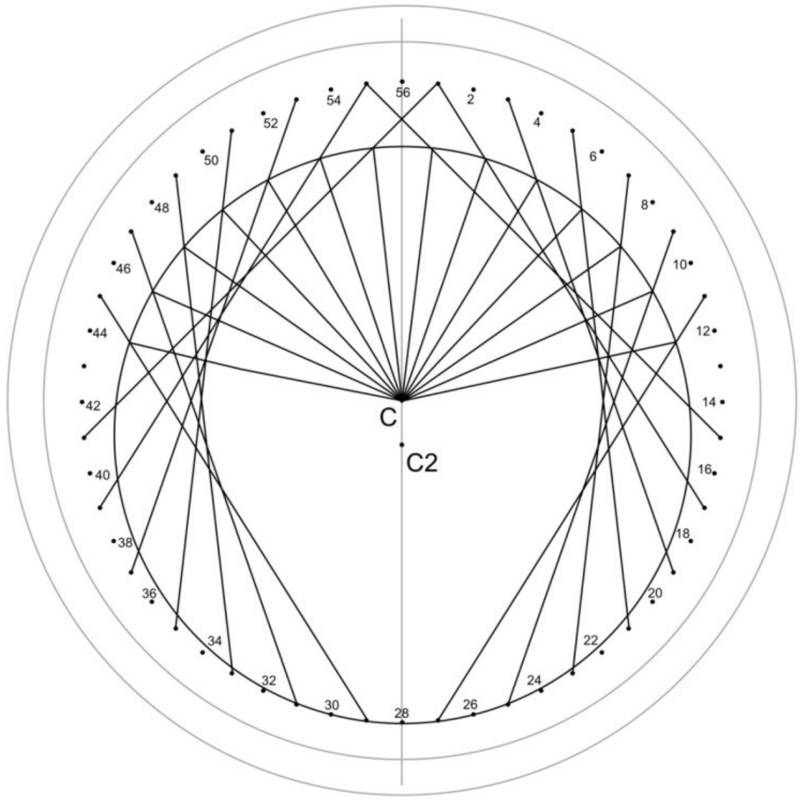


Fig 3 Start Producing the 30 Radials.

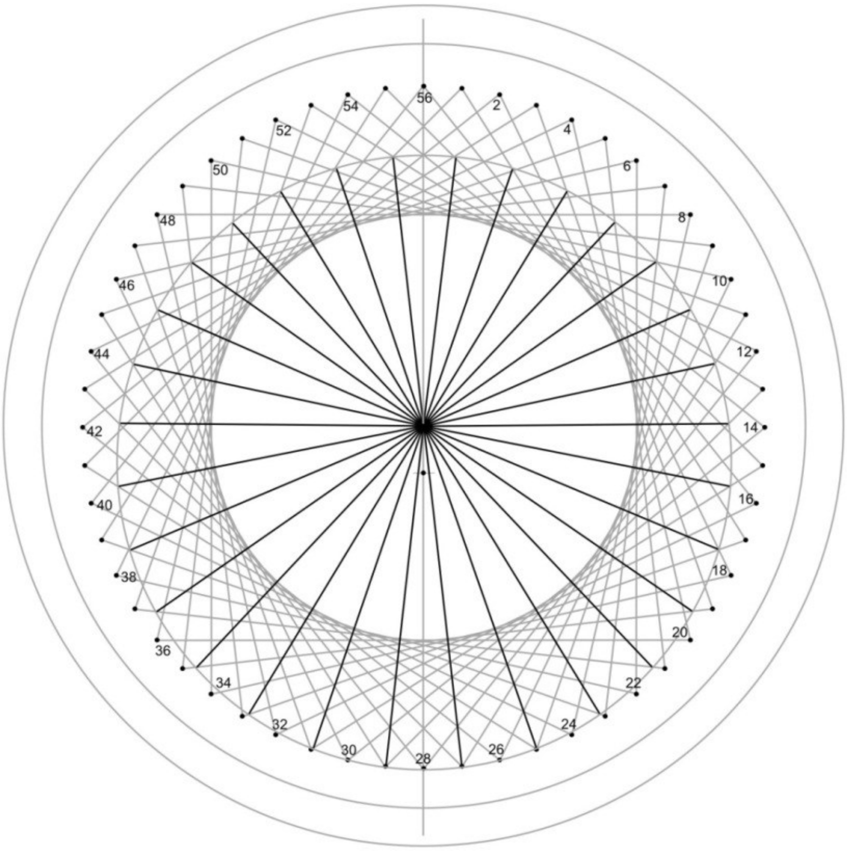


Fig 4 Thirty Radials and ‘Y’ circle Completed. Mark Where Radials Cross the ‘Y’ Circle.

The ‘Y’ circle.

As a result of this construction you should also have a network of crossing chord lines that produce a rough circle inside the vernier circle. This corresponds to the archaeological feature referred to as the ‘Y’ holes.

Step 15) This ‘Y’ feature may be completed and smoothed by connecting all the even-numbered Aubrey points, again spanning 16 Aubrey segments. These are the ones that we missed before. Mark the central part of these chord lines. The builders made a ‘mistake’ doing this; one of their chords spanned 17 segments instead of 16. This was one of the clues that led me to consider the peg and string model. I think it was deliberate. It should be noted that this ‘mistake’ could easily be replicated by this method of producing the ‘Y’ circle.

Do not add any more radials, thirty is enough.

Step 16) Mark all the points where the thirty radials cross the rough circle delineated by the network of crossing chords. This is the foundation for the later digging of the ‘Y’ holes, but for now, we suggest that pegs were driven into the ground at these points. The appearance of the ‘Y’ circle as a by-product of this method of producing 30 radials is also powerful evidence that the method was actually used.

From this we may deduce that the builders were not primitive men.

They had advanced understanding of geometry.

The 'Z' circle.

Step 17) Up until now all the geometry has been sequential, but here we come to a loose end.

The builders included the 'Z' circle, but there is no geometric need for such a circle, and apparently no way of determining its position or derivation. We should put it in, but if we do not yet know what it means we will need to guess, or copy the monument.

I have put it on my drawings by copying the method apparently used by the builders. The 'Z' feature could be placed in an arbitrary choice of chords drawn from the 30 'Y' points (step 16). Inspecting the archaeological drawing suggests that this is what the builders appear to have done, spanning seven segments of the 'Y' feature, thus subtending an angle of 84 degrees at the centre. In doing this they made another apparent mistake, continuing to span seven segments of the 'Y' circuit, even through the disrupted area produced by their earlier 'mistake'.

It should be noted that this 'mistake' could easily be replicated by this method of producing the 'Z' circle.

This formed another of my 'dumb-clues'.

Step 18) To finish the 'Z' feature we should mark in the points where the 30 radials cross the 'circle' delineated by the network of crossing lines. The result is called the 'Z' circle.

Note; I am aware that the actual monument presents large holes to represent the 'Y' and 'Z' features, and I intend to show the holes later. For now, let us please leave them as lines and points.

Step 19) Finally, draw a simple circle of radius 3 sticks centred on our original central point. This will help us place the inner monument when we have drawn its ground plan. It will fit neatly onto this circle.

This is the almost completed outer monument, (see fig 5).

Please do not erase the chord lines.

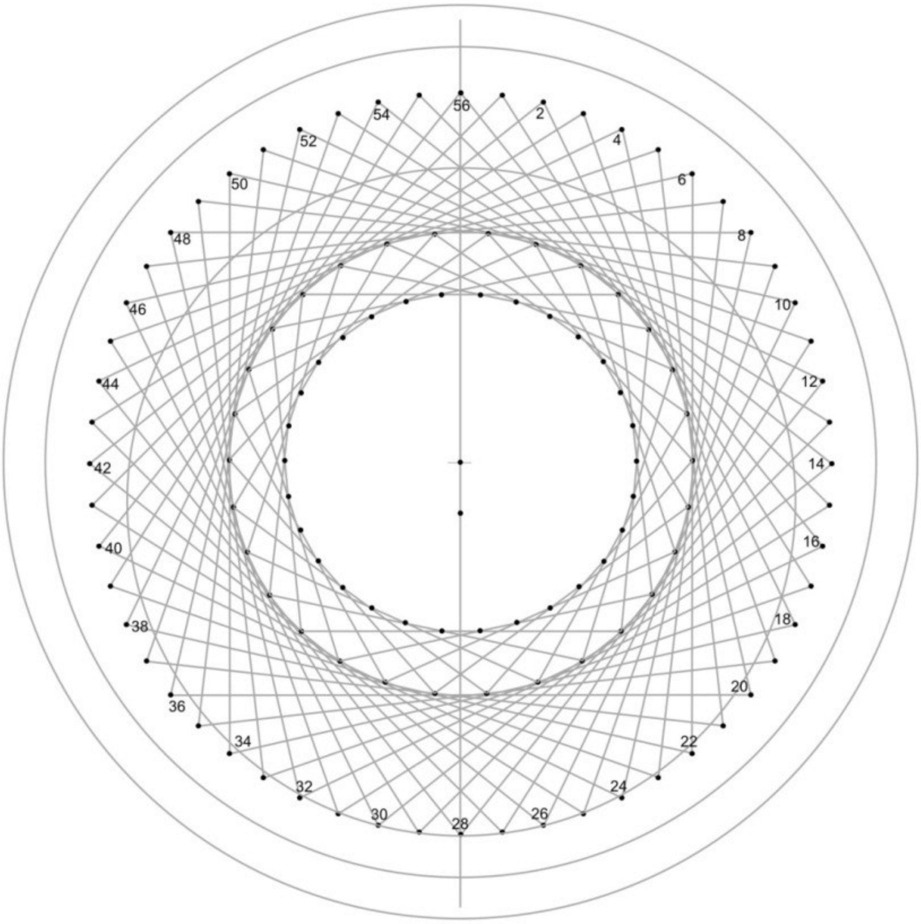


Fig 5 Almost Completed Outer Monument showing Aubrey circle, 'Y' Circle, 'Z' Circle and thirty radials, with bank & ditch guide lines.

We will now move on, to consider the inner monument.

<u>The Inner Monument</u>

The inner monument stick is shorter than the outer monument stick, 3 outer sticks are equal to 10 inner sticks.

Since the monument is ratiometric, and we are simply working on paper, it doesn't matter; we just continue, using the same stick as we used before, remembering that we are working to a different scale.

We start as we did with the outer monument, starting with a copy of the Aubrey circle.

If you have a photocopy of figure 1, then go to step 21.

Step 20) It is necessary to draw the 56 points again, so if you do not have a photocopy please take a new piece of paper and repeat steps 1 to 7 to create a new one.

Step 21) We should now use this copy of the Aubrey circle to determine the locations of the inner features. This is not as easy as in the outer monument, because there is no geometric imperative to guide us.

It is here that the term 'ad-hoc' comes into its own. Scientists will object strongly to this, but it cannot be helped.

Step 22)

Placing <u>the Great Sarsen Circle. (See Figs 5, 6 & 7)</u>

The circles of 10 and 11 sticks radius used to start off the drawing are here used to delineate the Sarsen Circle; the inner faces of the Sarsen Circle uprights are tangent to the circle of 10 sticks. Since 10 small sticks is the same as three long sticks, (step 19) it is easy to see how this connects the two monument structures. Please note that the thirty radials are already produced. I have introduced some random elements into my drawing of the stones, to simulate the dilapidated nature of the real thing.

Step 23) <u>The Bluestone Circle.</u>

There is a lot more to do, but when we have finished drawing the inner plan, the inner 56 point circle can be converted into the somewhat confused archaeology of the so-called 'Q' holes. The present bluestone circle is not where it was to start with. See Professor Atkinson's book, page 60. The 'Q' and 'R' holes underlie the current bluestone circle. The outermost of these rings, known as the 'Q' holes, are where the original circle of 56 pegs would have been.

Inner Features

Before we dig out the 56 inner pegs and replace them with bluestones to create a bluestone 'Q' circle we must now attempt to place the remaining structures, which are:-

a) The Trilithons
b) The bluestone horseshoe.
c) The 'back-sight' holes.
d) The 'altar stone'.

The Trilithons.

I tried long and hard to find a geometric necessity for these features and found none.

The Trilithons are not difficult to place, but they lack a geometric reason for the placement.

The main verticals of the central trilithon lie between chords drawn from 'inner Aubrey' points 21-35 and 20-36. Other pairs of chord lines place the other stones, as shown on the drawings.

(*It was at this point that the thought occurred to me that the stones had been placed to draw attention to the chord lines, the complete reverse of my previous working mind-set. From then on my attitude to the monument changed. I ceased trying to place the features with chord lines, and started trying to identify which chord lines were indicated by the features.)*

The chord lines indicated by the remaining trilithon uprights are 31-48 and 30-49, 33-52 and 34-51. On the other arm of the 'U' the lines are 26-7, 25-8 and 23-4 with 22-5.

The trilithon uprights are placed between these pairs of lines. Since I now believed the stones were only put there to draw attention to the chord lines, the actual stones are not important. I have put some on the drawings to indicate roughly where they are.

Bluestone Horseshoe.

This feature is placed almost corresponding to the same circuit as the 'Z' feature on the outer monument. It can be placed by drawing chords from the inner Aubrey points 18-37 spanning 19 segments.

The circuit can be progressed by stepping the chord line around the inner monument Aubrey points, spanning 19 segments every time. On my drawings I have not troubled to complete the full 'U' shape, which is obtained simply by finding the desired chord lines.

'Back-Sight' holes.

The name is derived from a preconceived notion that these holes held stones that served a certain purpose. The name is unjustified, but we may as well use it.

Regrettably Prof. Atkinson does not give much in the way of location data in his book, stating simply that they are behind the Altar stone. I place them (from astronomical data) where lines 17-38 and 18-39 cross the axis, one on either side of the axis.

Altar stone.

Another stone named by preconception. It has nothing to do with an altar.

The stone lies across the axis “about 15 feet” from the inner face of the main trilithon. (Page 56 of ‘Stonehenge’). Unfortunately the Professor fails to say if the 15 feet refers to one of the edges of the stone, or the centre.

Since his book is intended for general reading only, we cannot criticise him for this, but it does leave me with a minor difficulty.

In the end, after much consideration, I joined inner Aubrey point 40 to both 16 and 17, as shown on the figure. This placed the stone across the axis as near as possible to the Professor’s description.

Since the stone is tapered and lies across the axis at a slight angle, it appears on archaeological drawings almost exactly as shown on my figure. This suggests that the Professor’s suggestion (page 56-57 of ‘Stonehenge’) that it once stood erect is possibly erroneous, and that the builders actually aligned it with the same chords that I used.

It is possibly a coincidence, but the altar stone is approximately one ***outer*** stick long.

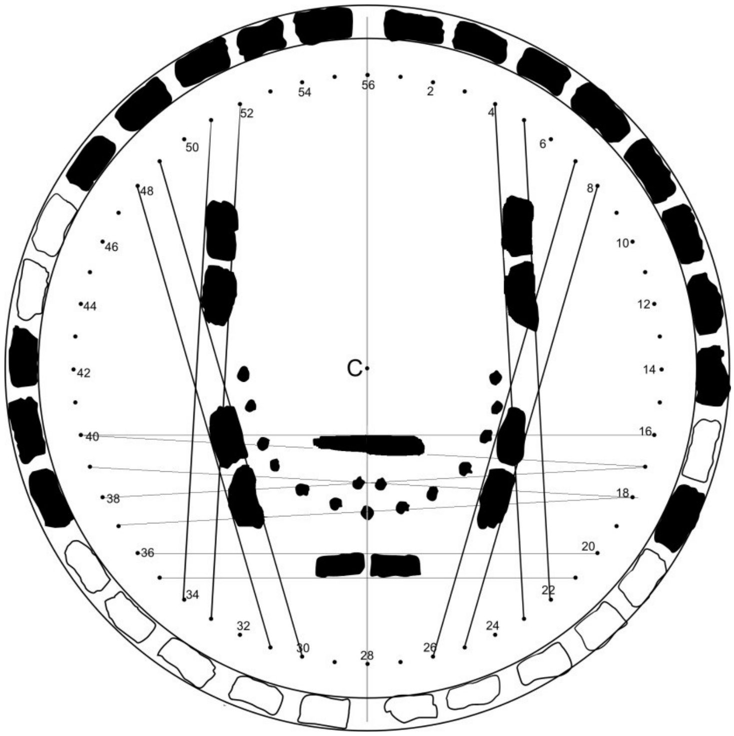


Fig 6 Inner monument plan produced with same template as outer monument.

Completed Plan (See fig 7)

The finished inner monument plan would have been drawn out full size on the ground before the outer was started. If we want to put the inner drawing that we have produced in its correct place, we would need to cheat a little and shrink our inner monument drawing to fit.

Using modern technology the inner drawing can be shrunk and slotted into the middle of the outer monument plan by placing the **inner** face of the Sarsen Circle, (Inner Monument circle of 10 sticks radius) exactly on the circumference of the circle drawn in step 19.

Having drawn the completed plan on the ground, the builders need to dig up all the pegs, and place the stones.

I suggest that you leave the chord lines in place for now, do not erase them entirely, they are useful for calculation.

For finishing touches the ‘Y’ and ‘Z’ features of the outer monument can be permanently preserved in the chalk by digging holes, possibly intending to place stones in these holes.

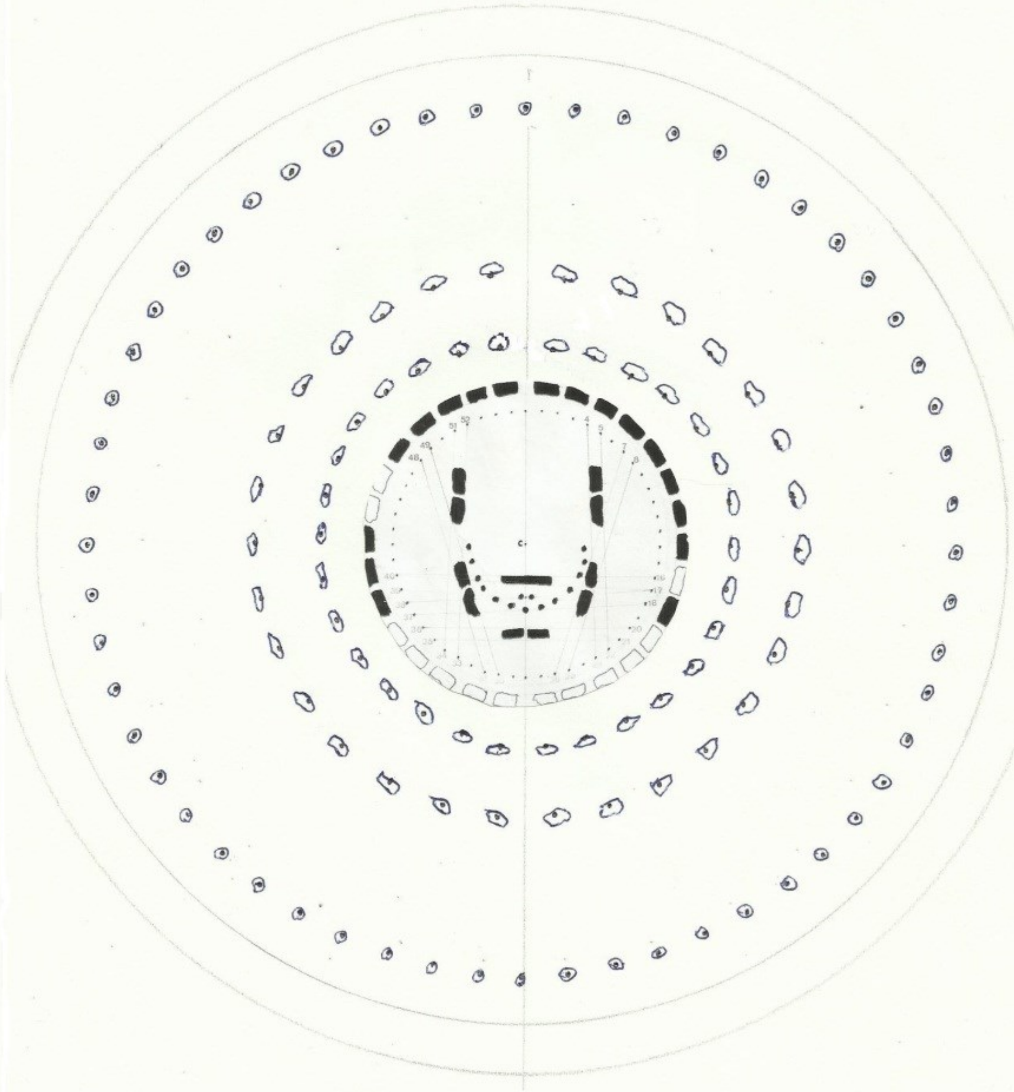
These are shown here but not exactly as they appear on the archaeological maps.

In an ideal world it should be possible to compare the drawing with the archaeological measurements, and this can be done up to a point. There are many archaeological details that I have ignored or overlooked as a matter of necessity because the available data is not precise.

For example, the archaeologists inform us that there is no unique central point from which all the circles are drawn, but it is not clear how many centres there are, or where they are.

It is also true that some of the features I have placed have been moved at some point after the monument was first built, and there are areas of confusion in the detail.

Fig 7 - This is drawn by hand, following the directions in this book, just to show it can be done. (Blobs to simulate holes and stones)



Scale = ⟝⟞ 1 Outer Stick

Details of Stonehenge

There are some details that confirm that the geometric construction outlined above was actually used.

- The method allows for 56 holes to be evenly spaced around a circle.
- The method delineates the guide lines for the outer bank and ditch.
- It allows for 30 radials to be generated from the 56 holes.
- These thirty radials are disposed symmetrically on either side of the axis in the same manner as the radials on the actual Sarsen Circle.
- If a slight error is made in the radius of the vernier, the result would be a larger gap between the first two radials either side of the axis. Such an effect was reported by Professor Atkinson.
- The process of producing 30 radials also produces the 'Y' feature, or something remarkably similar.
- The same construction template allows for the accurate placing of the Sarsen Circle, with its 30 radials, and provides a location for an early version of the Bluestone circle, (in 'Q' holes).
- The method results in an integrated design, relating the inner monument to the outer, and linking the two to form a homogenous whole.
- The method accurately reproduces much of the ground plan as described by archaeology.
- The method can reproduce 'mistakes' made by the builders during the layout of the 'Y' and 'Z' holes.

The over-all consideration is that the method provides a rational geometric design for the Stonehenge monument that is an integrated whole.

The actual construction work in placing the stones most probably took place over a period of a few years; the amount of work involved dictates that it would have taken some time.

If the ground-plan is a unified whole, as it clearly is, then the stonework and the construction must also be an integrated whole. The C14 dating spreads construction over a period greater than a thousand years. I conclude and declare that the C14 dates are wrong.

In addition, and most importantly, the evidence is strong that this method described above was used, from which we must conclude that the designer was not a primitive Neolithic man. *The designer had a powerful brain, and an advanced knowledge of geometry and trigonometry.*

*

Astro-Archaeology

Although not immediately obvious the above drawing is actually an exponential scale mathematical model of the planetary orbits of the Solar System, as the following graphs purport to show.

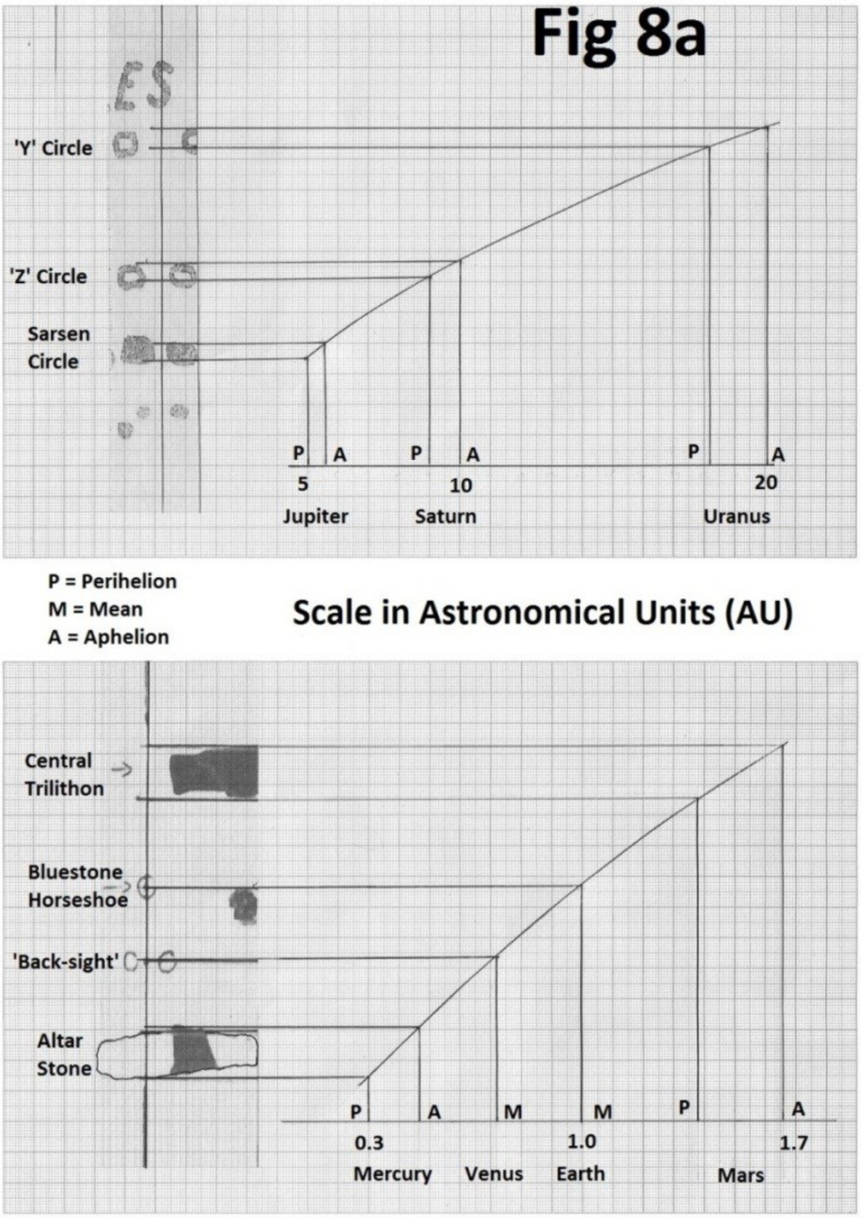
The ‘y’ axis of the following pair of graphs (8a) represents a section cut from an actual archaeological drawing of Stonehenge. The ‘X’ axis represents astronomical figures taken from Norton’s Star Atlas.

The second pair (8b) is the same graph with the astronomical data raised to the powers shown in brackets.

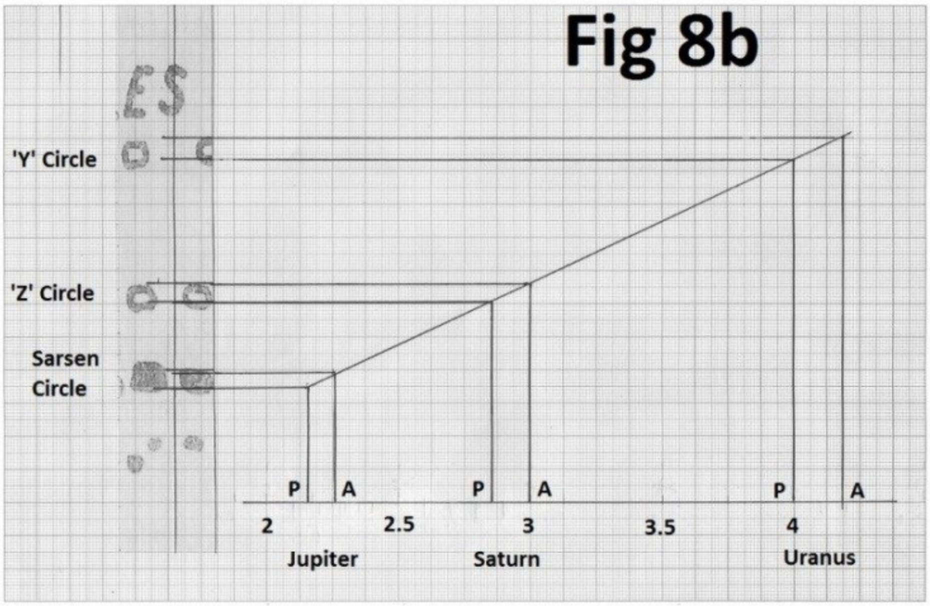
The graphs speak for themselves.

It is evident from the following two graphs that the Stonehenge features could have been placed by reference to astronomical data.

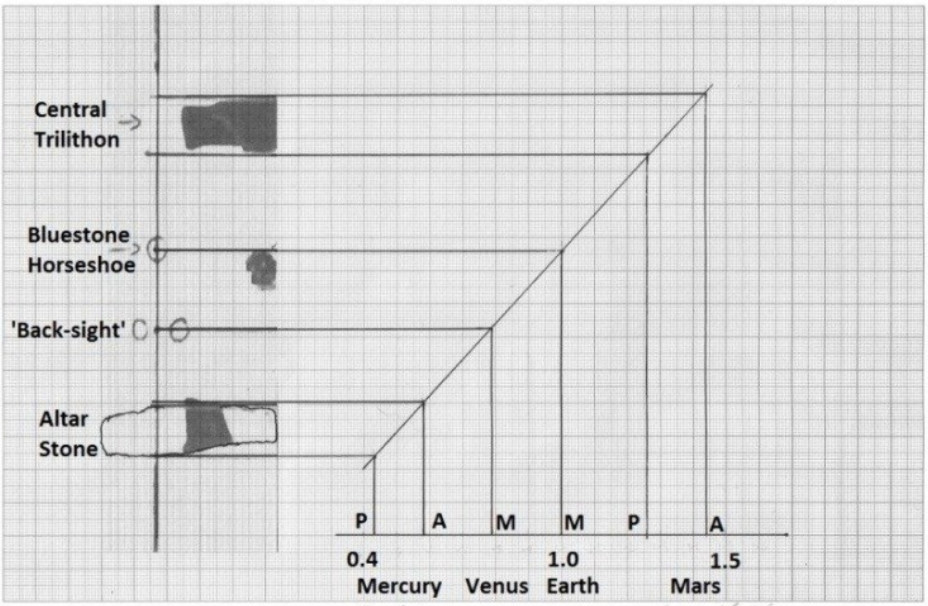
Further study revealed the information detailed in the next section entitled ‘Summary of Astronomy.’



Scale in Astronomical Units (AU)



Scale in AU raised to power of (3/2π)



Scale in AU raised to power of (9/4π)

Summary of Astronomy.

Study of the above illustrated graphs reveals that the two exponents are related. It follows that a relationship between the orbits of the inner Solar System and the outer Solar System should also be related by those same exponents. This merited further consideration.

The following mathematical equation relating to the Solar System was obtained from a study of the ground-plan of Stonehenge by logical deduction.

$$AU_i^{(9/4\pi)}.\ln 30 - F = AU_o^{(3/2\pi)}\text{.....equation 1}$$

Where (AUi) indicates inner orbital values in Astronomical Units, and (AUo) indicates outer orbital values in Astronomical Units.

The Mathematics

Part 1 - Simplifying the Equation

(Consult with Graph 9)

My initial equation, as obtained from the monument is in the form as shown above, however I was advised by an academic mathematician that it would be better if I simplified it.

(Note: - I was reprimanded by the same academic mathematician for placing 'F' on the 'x' axis as a negative value. Apparently this is not acceptable in modern convention; however it is the way it was represented on the monument, so I kept it. Purists can divide by Ln30 and place it on the 'y' axis as a positive value, if they so desire.)

*

To find 'F' - If we substitute π in the place of AUi and 20π in the place of AUo into equation 1, then 'F' becomes the only unknown and we can find the value, which is a constant.

$$\pi^{(9/4\pi)}.\ln 30 - F = (20\pi)^{(3/2\pi)}$$

Solving for 'F' ... **'F' = <u>0.500772097</u>**:

The main equation can now be simplified if the look-up table of pre-worked values is used (Table 2). So instead of working the exponents every time, we just look them up in the table.

The main equation then becomes ….

$$(y.\ln 30) - F = x$$

Since ln30 and F are both known, the equation simplifies further to….

$$y = (x + 0.500772097) / \ln 30$$

Or……………. **<u>y = 0.294014103 x + 0.147234059</u>**

This equation is shown graphically in **<u>fig 9.</u>**

This is the standard schoolbook format of a straight line relationship with offset.

It means that once the exponents have been applied, the orbits of the planets are revealed to be related by a simple linear function.

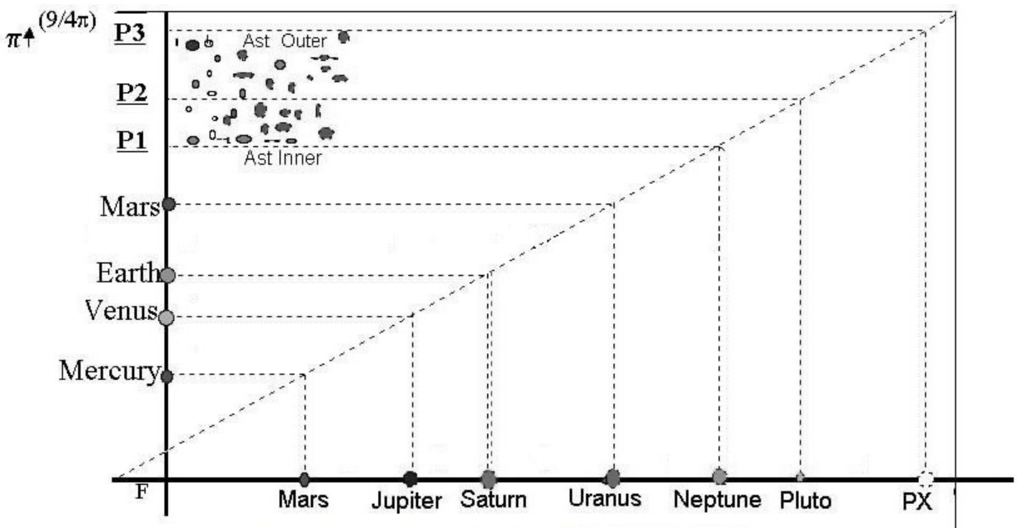
(Other annotations, P1, P2, P3, and Px marked on figs 9 & 10, are discussed elsewhere.)

The correlation coefficient is; r = 0.999900, which means that the equation is valid.

This simplified form is no different than the original, and it is easier to follow. However it tends to hide the factors that came from the monument, obscuring some important properties. (For example the relationship to Kepler's third law is hidden.)

When presented in this standard configuration the resulting graph (fig 9) is easy to understand and to use, it relates inner orbits to outer orbits.

However, it does not reveal the whole story. In the original format, as derived from the monument, things are not as simple as they seem.



Illustrating the function of Equation 1, see text

Fig 9

<u>Part 2 - Pythagoras and</u>

<u>An Equation for Venus</u>

(Consult with Graph fig. 10)

Let us imagine that we do not know the mean orbits of any of the planets, except Earth and Mercury. We may accept that we know that the planets exist, and we know their names, but not their mean orbital distances.

All we know are the mean orbits of Mercury and Earth.

We will accept that Earth has an orbital mean of unity, 1AU, which when raised to the power of anything remains as unity.

Mercury mean of 0.3870987AU is raised to the power of **(9/4π)** to give the 'y' axis value of **<u>0.506756171.</u>**

From Earth at unity, and Mercury 'y' value of **0.506756171**, we can calculate all the other orbits, but first we need to find the orbit of Venus.

*

Let 'V' = the mean orbit of Venus in AU, assumed to be unknown.

Then: $\mathbf{V = (1 - V^{(9/4\pi)}) \div (V^{(9/4\pi)} - 0.506756171)}$

I will refer to this as the 'Equation for Venus'

It is possible to solve this for V, by a process known as iteration, or successive approximation.

When this is done, we get the answer

<u>V = 0.723331002…</u>,

which is near enough exactly what science measures it at. (0.7233322.. AU)

Having completed the above calculation, in the final iteration we should also have obtained several by-products, one of which is $V^{(9/4\pi)}$ which is the 'y' axis value for Venus.

This is **<u>0.792971546</u>**.

We must also have found a value for

$\mathbf{(V^{(9/4\pi)} - 0.506756171)}$ which we will call 'a'.

<u>'a' = 0.286215375</u>

And we must also have obtained a value for $\mathbf{(1 - V^{(9/4\pi)})}$ which we will call 'b'.

<u>'b' = 0.207028454</u>

Thus, from the two planets Earth and Mercury we are able to calculate a figure for Venus, and the values of ‘a’ and ‘b’.

We then calculate ‘c’ by assuming that ‘a’ and ‘b’ are related to ‘c’ by Pythagoras.

Figures obtained from the Equation for Venus are:-

a = 0.286215375

b = 0.207028454

c = 0.353242157 by Pythagoras

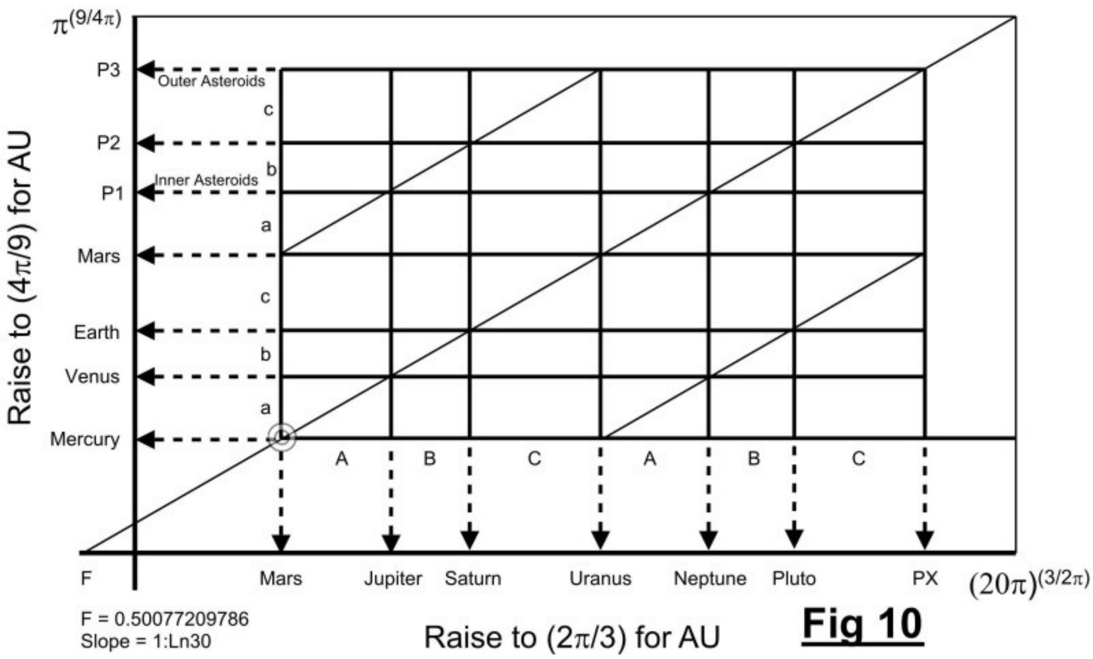
Multiply by ln30 (slope of line) gives:-

A = 0.973474984

B = 0.704144635

C = 1.2014463 by Pythagoras.

With these values we can create a conceptual Pythagorean grid and add it to fig.9 - The result is illustrated graphically on Fig 10.



π(9/4π)
P3
Outer Asteroids
c
P2
b
Inner Asteroids
P1
a
Mars
c
Earth
b
Venus
a
Mercury
Raise to (4π/9) for AU
A
B
C
A
B
C
F
Mars
Jupiter
Saturn
Uranus
Neptune
Pluto
PX
(20π)(3/2π)
F = 0.50077209786
Slope = 1:Ln30
Raise to (2π/3) for AU

Fig 10

<u>Locating the Grid</u> <u>(see fig. 10)</u>

To locate a datum placement point for the grid (Circled on fig. 10), and hence the whole grid, we can use the 'y' value for Mercury and derive the 'x' value from this by putting it through the equation.

From Mercury, the 'y' value is **<u>0.506756171</u>**

Multiply this by ln30 and subtract F.

0.506756171 x ln30 = 1.723577762,

Subtract 0.500772097 = 'x' value is **<u>1.222805665</u>**

These two figures locate a datum point for the grid. (Corner marked with a double circle on fig. 10)

<u>0.506756171</u> on the 'y' axis and **<u>1.222805665</u>** on the 'x' axis.

So we can produce and place the grid to any degree of accuracy we wish, and I have chosen to use as many decimal places as possible on my calculator.

The entire grid is placed by calculation from the mean orbit of Mercury, which is derived via the exponent from the measured value given in Norton's Star Atlas. Being a measured value it is not an absolute, so we will define it as an absolute.

Note; the grid is defined as being made up of sectors which are in a 'perfect' Pythagorean relationship, though calculation is only taken to nine decimal places.

No actual triangles are visible. Conceptual triangles are implied.

We now have a defined perfect Pythagorean reference grid with which to compare the orbits.

Since we know the 'y' and 'x' values for the datum corner of the grid, (circled) and we know the values of a,b,c and A,B,C we can now *use the grid* to calculate all of the 'y' and 'x' values for the places where the perfect grid projects onto the axes, as accurately as we can. (See fig 10)

This is a simple matter of adding up.

Once we have these 'y' and 'x' values, we can convert them into Astronomical Units by raising them to the relevant inverted exponents **($4\pi/9$)** for the 'y' axis and **($2\pi/3$)** for the 'x' axis.

When we compare the resulting AU values to the table of planets we find that with the sole exception of Saturn, the figures correlate to a very high degree. See **table 3**, which lists the results I obtained.

Saturn is out by 2.5% (Compared to the measured figure in AU).

The comparison is shown graphically on fig 9, where the only discrepancy visible is that of Saturn, which shows as a double line. All the others are so small they are less than the thickness of the lines, so are not visible.

However, it is worth noting that the discrepancy is well within Saturn's orbital deviation, so twice in its orbit, Saturn complies as accurately as all the rest.

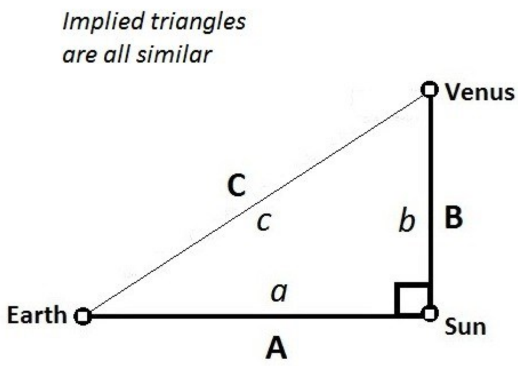
If I could now just ask you consult table 3 with figs 9 and 10 and to take a minute or two to consider what we have just described, and done.

We have described how we can calculate all the planetary orbits of the Solar System from just a prior knowledge of two, Mercury and Earth.

And of course, I have done these calculations, and so could you, if you had a mind to.

[Note, we can also obtain orbital periods by using the modified exponents ($2\pi/3$) for the ‘y’ axis, and (π) for the ‘x’ axis. Astronomers may observe the built-in functioning of Kepler’s third law.]

It is also a fact worth commenting on that the Pythagorean relationship is ubiquitous throughout the Solar System.



It is worthy of note that ‘Pythagoras’ implies conceptual triangles, and the triangles are all ‘similar’ in the geometric meaning of the word, and all are also similar to the triangle formed when ‘real space’ Venus and Earth form a ninety degree angle at the sun. (Here I refer to calculated figures).

The ratios b/a and B/A, as derived, both equal the measured orbit of Venus in AU to five decimal places, which means that the orbit of Venus in AU is somehow involved in placing all the other orbits.

<u>This represents something that should be utterly impossible in a natural System.</u>

It is also possible to relate any orbit to any other, using the grid, thus demonstrating that the planetary orbits of the entire known Solar System are interrelated and integrated into an artificial, Pythagorean, whole.

The real scientifically measured Solar System conforms very closely with this completely artificial Pythagorean construction.

Statistically, there is no chance at all that it could have come about by natural forces.

It occurs to me that the designer of Stonehenge may have been trying to convey some kind of message about the nature of our Solar System.

<u>Table 1</u>

Orbital data in <u>astronomical units</u> abstracted from

***Norton's Star Atlas* (17th edition).**

(Except Asteroid belt, which are nominal figures)

PLANET	PERIHELION	MEAN AU	APHELION
MERCURY	0.306	0.3870987	0.467
VENUS	0.718	0.7233322	0.728
EARTH	0.983	Unity	1.016
MARS	1.381	1.5236915	1.666
ASTEROIDS	Nominal 2.00		Nominal 3.00
JUPITER	4.951	5.2028039	5.455
SATURN	9.008	9.5388437	10.069
URANUS	18.275	19.181871	20.088
NEPTUNE	29.8	30.057924	30.316
PLUTO	29.58	39.439	49.19

Table 2 Look-Up Table

Ready worked figures for graph.

Planet	Mean Orbit in AU	$AU^{(3/2\pi)}$ = Outer. x axis	$AU^{(9/4\pi)}$ = Inner. y axis
Mercury (Me)	0.3870987		0.506756171
Venus (V)	0.7233322		0.792972486
Earth (E)	1.0000000		1.0000000
Mars (Ma)	1.5236915	1.222719691	1.35204255
Jupiter (J)	5.2028039	2.197749527	
Saturn (S)	9.5388437	2.93545051	
Uranus (U)	19.1818710	4.097654299	
Neptune (N)	30.0579240	5.077774766	
Pluto (P)	39.4390000	5.7809403	

Table 3

Table demonstrating how closely the real orbits conform to the Pythagorean pattern described in text.

Note – exact results depend on route taken through the grid.

PLANET	Norton's Mean Orbit in AU	Calculated Orbit in AU	Percentage difference
MERCURY	0.3870987	Datum	Not applicable
VENUS	0.7233322	0.723331002	-0.00017
EARTH	Unity	Datum	Not applicable
MARS	1.5236915	'y'= 1.525579445 'x'= 1.523915895	+0.124 +0.0147
JUPITER	5.2028039	5.195539524	-0.14
SATURN	9.5388437	9.3020245	-2.5
URANUS	19.181871	19.22324153	+0.217
NEPTUNE	30.057924	30.02787608	-0.1
PLUTO	39.439	39.41830763	-0.0525

Exercise Relating to Px

I have marked some other points on the graph which apparently correspond to empty orbits. Points P1, P2 and P3, appear to relate to the asteroid belt, and are rather meaningless.

Point Px is useful to illustrate the functioning of the grid, as an example calculation.

We can find the x axis value of Px by a variety of means, but the simplest is just to add two lots of A + B + C to the 'x' value of the bottom left corner of the grid, (see above).

This totals to give Px an x axis value of **6.980937489**

We can now do two things with this figure.

1) We can raise it to the inverted exponent ($2\pi/3$) to give a mean orbit of…
   58.5448… AU.

2) We can raise it to just (π) to give the orbital period in years as…
   447.95…years

This describes the orbital parameters of a hypothetical missing planet, but it does not mean that the orbit is actually occupied by a planet. I have no idea if this planet exists or not, but if astronomers ever discover a planet in that orbit, I will not be surprised.

*

Summary

1) The major orbits of the Solar System are interrelated by the main equation.

2) The ratio (b/a) and of course (B/A) is equal to the orbit of Venus in AU but is also *determined by* the orbit of Venus. This is not simply an approximation; it is accurate to five decimal places, and unique.

3) The equation is bi-directional; an inner orbit could be calculated from an outer orbit.

4) The orbits can be calculated from Pythagoras.

5) The orbits can be calculated with the use of trigonometry.

6) The implied triangles (a,b,c & A,B,C) are all similar, and similar to a triangle constructed from Venus/Earth mean orbits.

7) Orbits can be calculated by adding and subtracting constants.

8) The exponents of the equation allow orbital distances to be interchanged with orbital periods. The function of Kepler's third law is integral part of the equation.

9) Any orbit can be calculated from any other, and all the orbits can be calculated from any two.

10) The orbits can be calculated by a number of different routes from any datum orbits. Divergence from Norton's data will vary very slightly depending on the route taken.

11) The exponents are related one to the other and both represent functions of a circle of circumference 3.

12) All the above was obtained from an ancient monument that is alleged to be a primitive Neolithic ritual site supposedly constructed piecemeal over an extended period of over 1,700 years. Clearly it is actually one homogenous integrated whole.

*

(Printable) Graphs follow

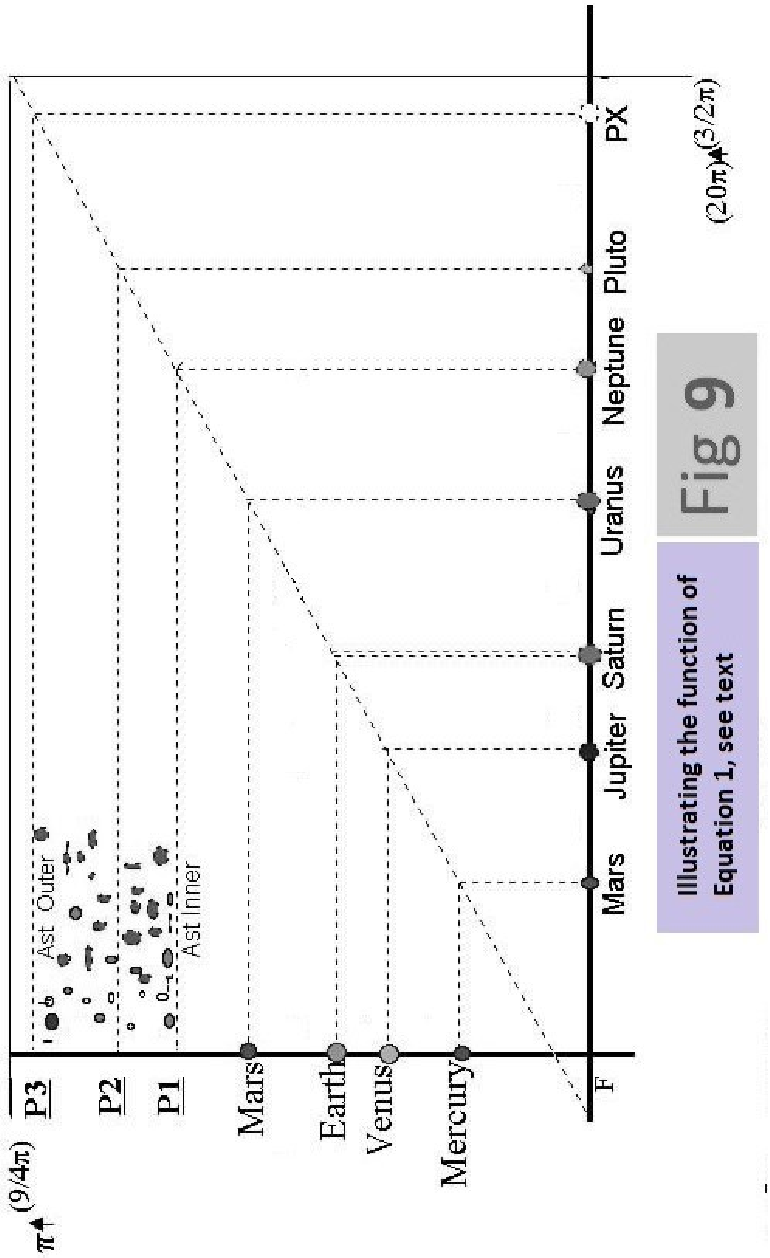
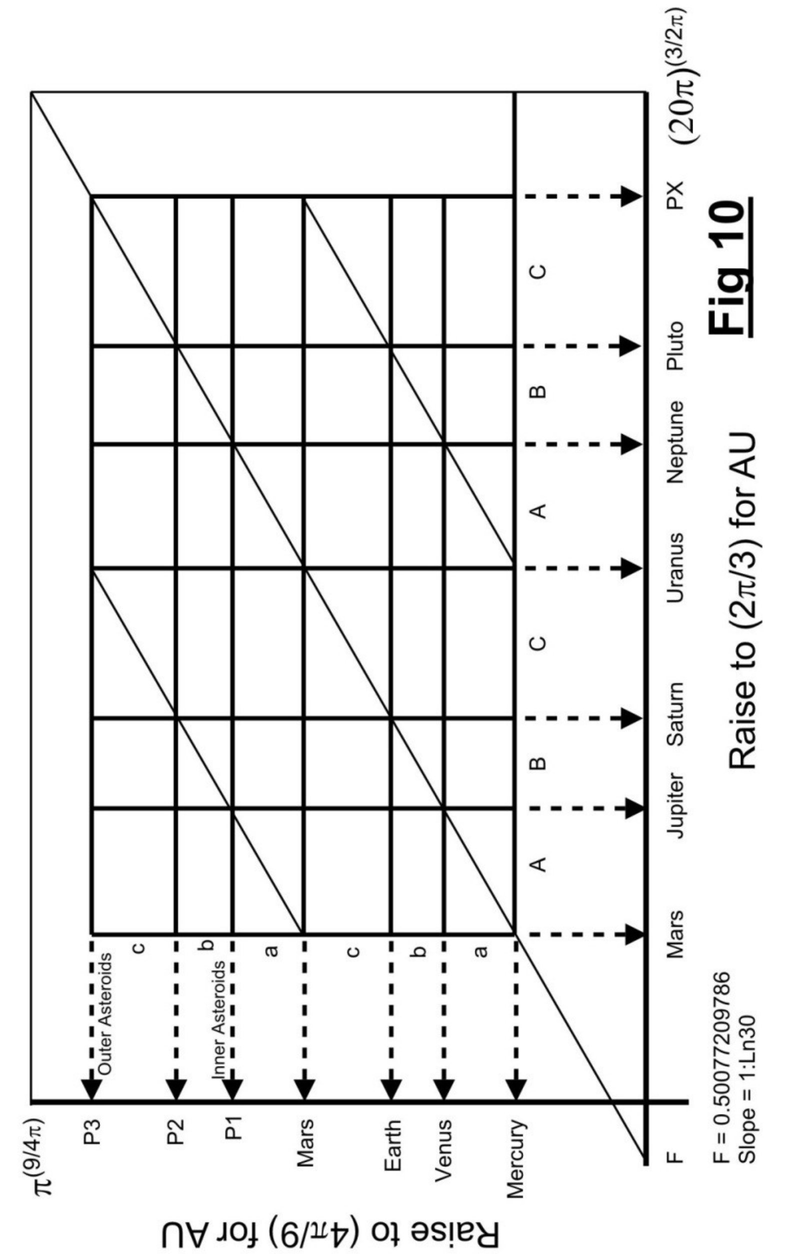


Fig 9

Illustrating the function of Equation 1, see text



$\pi^{(9/4\pi)}$
P3
P2
P1
Mars
Earth
Venus
Mercury
F
Outer Asteroids
Inner Asteroids
c
b
a
c
b
a
Mars
A
Jupiter
B
Saturn
C
Uranus
A
Neptune
B
Pluto
C
PX
$(20\pi)^{(3/2\pi)}$
Raise to $(4\pi/9)$ for AU
Raise to $(2\pi/3)$ for AU
F = 0.50077209786
Slope = 1:Ln30

Fig 10

…