

The Past master's Jewel and the 47th Proposition

The Worshipful Master hasn't got one! (He is a Brother)
Worshipful Bro. Lomax has a modern one!
And Worshipful Bro. Fairhurst has a very old English one. (His is the IPM's Gallows Jewel)
I refer Brethren to the Past master's Jewel.

From a current global perspective, the most widely used Past Master's symbol consists of the 47th Proposition suspended from a square.

The 47th Proposition has been used in Masonic symbolism at least as early as 1735 when it was first published in "**Smith's Pocket Companion**".
However, no evidence can be found that it was used specifically as a Past Master's symbol until the year 1815 when the first **Book of Constitutions** of the United Grand Lodge of England was published, and the prescription for a Past Master's Jewel consisting of "**The Square and the diagram of the 47th proposition of the 1st Book of Euclid engraved on a silver plate, pendant within it**" was codified.

To be perfectly accurate, what is depicted is actually the 48th Proposition, which is the proof of the statement of the 47th proposition.
But I am not going to argue with Grand Lodge.

When the IPM is installed he is usually given an address which in some way explains the significance of the jewel and its Masonic interpretations. But it does not go much into the history or origins of it.

To do that, we must go back to around 1600-1900 BC, well before Euclid and even before Pythagoras, probably to the Golden Triangle around Babylon or possibly even as far away as China.

So, we start with the question, who was Euclid?

Euclid of Alexandria, was born about 325BC, and became probably one of the most prominent mathematicians of antiquity.

He lived at the time of the first Pharaoh of the Ptolemaic Dynasty in Egypt.

Ptolemy, was in fact one of the generals of Alexander the great, who was left behind in Egypt “to sort of mind the shop” whilst Alexander carried on to the east to conquer Persia and India and chase King Darius across a lot of Asia minor, but that as they say is another story.

As well as being a prominent mathematician Euclid was also a collector of knowledge of all descriptions and as the greatest library of the age was at that time in Alexandria, it was obviously a great centre of learning.

Euclid actually wrote amongst other things, a set of 13 books which were called “The Elements of Geometry”, and the 47th proposition in the 1st book is the one usually known as Pythagoras’s Theorem, which is as you will all remember from your school days as **“The square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides”**,

That’s the easy way, but in the published version it’s written as,

“In right-angled triangles the square on the side opposite the right angle equals the sum of the squares on the sides containing the right angle”.

Now you know why it was changed to the school day version!

Because I can’t remember the original version and I have just read it!

So, now then, what about Pythagoras?

Pythagoras was born about 200 years before Euclid in around 570BC on Samos, which is an island in Greece, but after travelling to Egypt and Babylon, then under the rule of Nebuchadnezzar, he settled in Croton, Magna Graecia, which is actually in Southern Italy, where many Greek city states had settlements.

Pythagoras established an order, not surprisingly called the Pythagoreans, which held knowledge and property in common and so all of the discoveries made by individual Pythagoreans were attributed to the order, and since in antiquity it was customary to give all credit to the master of the order, Pythagoras himself was given credit for the discoveries made by his order.

It has also been customarily accepted that the Pythagoreans discovered most of the material in the first two books of Euclid's Elements.

One of the most important characteristics of the Pythagorean order was that it maintained that the pursuit of philosophical and mathematical studies was a moral basis for the conduct of life.

But the idea that he was a Freemason or that he shouted "I have found it" and slaughtered a hundred cattle upon the discovery of the proof of this proposition, is best understood as apocryphal legend and not as historical fact.

The proposition, 1.47, often called the Pythagorean Theorem, was called that by a man named Proclus, (450 BC) in his *Commentary on the Elements* Centuries after Pythagoras and even centuries after Euclid.

But the knowledge of this mathematical relationship is far older than Pythagoras.

More than a millennium before Pythagoras, the old Babylonians (Ca 1600-1900 BC) used this relationship to solve geometric problems involving right triangles.

Moreover, the tablet known as Plimpton 322, written about 1800BC in cuneiform (those are the triangular shaped characters) and held in Columbia University, USA, shows that the old Babylonians could construct all the "Pythagorean triples of numbers" –which are: - a, b and c such that $a^2 + b^2 = c^2$ which effectively describe triangles with internal sides. (The smallest of these relationships is 3, 4, 5.)

Anyway, Brethren, all this proposing and multiplying this by that and taking away the first number you thought of is all very good sitting under a tree on a nice sunny afternoon when you have nothing better to do. It's called **Theoretical Mathematics**, but if king

Nebuchadnezzar or Pharaoh or some other powerful person comes along and wants a new palace or temple building you had better know some **Practical Mathematics**, or you might be become a candidate for the eunuch's club

Well, firstly how do you get this magical right-angle on which everything depends. You can't just nip down to B&Q and get one off the shelf, and what about vertical and horizontal?

Vertical is pretty easy; all you need is a piece of string with a weight on the end.

Horizontal is a piece of string with a weight on the end in a sort of frame.

But, the knowledge of how to form a perfect square angle without the slightest possibility of error has been considered of the highest importance in the art of building from time immemorial.

The men you needed in those days for this kind of work were called **Harpdonaptae**.

Harpdonaptae, literally translated means "Rope Stretchers" or "Rope Fasteners" in ancient Egypt and Babylon.

The **Harpdonaptae** were architectural specialists who were called in to lay out the foundation lines of important buildings.

They were highly skilled and relied on astronomy (the Stars) as well as mathematical calculations in order to form perfect square angles for each building.

In the Berlin museum is a deed, written on leather, dating back to 2000 BC, long before Solomon's temple was built, which tells of the work of these "Rope Stretchers".

Historically, a building's cornerstone was laid at the northeast corner.

Why the northeast?

Probably this was for no other reason than that's the way it worked out when the **Harpdonaptae** did their thing.

The ancient builders first laid out the north and south lines by observation of the stars and the sun, especially the North Star, (POLARIS), which they believed at that time to be fixed in the sky.

(They actually thought that the sky was like the inside of a huge tent and the stars were holes in it.)

So that only after laying out a perfect north and south line could they use the square to establish east and west lines for their foundations.

The 47th Proposition of Euclid established those true east and west lines, so the “rope stretchers” could ascertain a perfect 90-degree angle to the north/south line which they had already established using the stars.

Down to the floor

Today building sites have viewing platforms to show the public how good their company is.

But knowledge is power, so trade secrets and the old wisdom was guarded very strongly, therefore the Harpedonaptae must have used some form of smoke, mirrors and theatre in order to keep their particular secrets.

They may even have worn aprons.

To achieve a right angled triangle it is only necessary to construct a triangle having sides with the proportions of 3, 4 and 5 units. This important knowledge was used by the Ancient Egyptians in order to position their temples exactly due East and West. The specialists, whose sole duty was to lay out the foundations of public edifices, were called *harpedonaptae*, meaning rope stretchers.

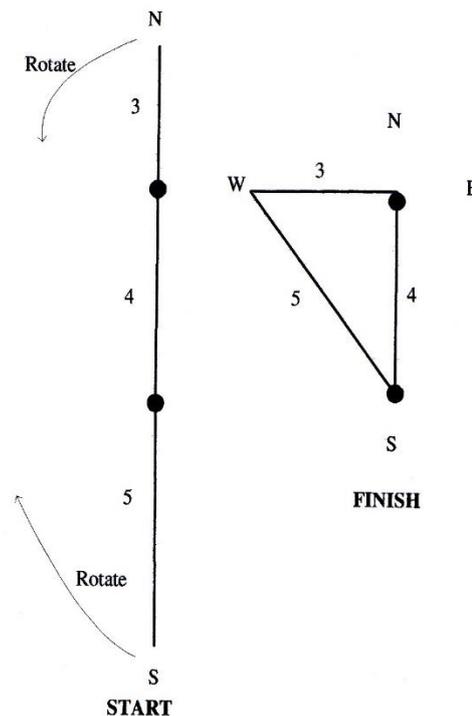


Figure 3 – The Egyptian Rope Trick

They first laid out the North and South line by observation of the stars and sun and their next step was to get the East and West line exactly at right angles. This they achieved by stretching a rope north and south, divided into three parts in the proportion of 3, 4 and 5, fastening the centre part by pegs. They then swung the loose ends towards the West until they intersected and a right angled triangle was formed, as shown in Figure 3. This also shows why it is – *“customary at the erection of all stately and superb edifices to lay the foundation stone at the North East corner of the building.”*

Down on the floor

For this part of the talk I must ask you to imagine that we are at the appointed site for the new building.

You must also imagine that this piece of MDF is ground level.

Requirements for the demonstration

1 piece of dowel (16 inches long)

4 pieces of dowel (7 inches long)

48 inches of strong string/rope

1 MDF Base Plate with 3 correctly drilled holes.

Divisions between knots 4 inches, for practical purposes

1. Place the 1st stick flat on the MDF Base Plate, ends pointing north/south.

2. Next, take the string with knots tied 4 inches apart. This will divide the string into 12 equal divisions.

Tie the two ends of the string together, (this is your 12th knot); again, remember that knot to knot must be 4 inches apart.

The string's total length is 48 inches. After you have tied the end to end knot, cut off the excess string.

The string should now be circular in shape and have 12 knots and 12 equal divisions between the knots.

3. Stab the 2nd stick in the MDF Base Plate, near the north end of the north/south stick and arrange a knot at the stick.

Stretch 4 divisions away from it, to the south end of the north/south stick and stab the 3rd stick into the MDF Base Plate.

Then place the 4th stick at the knot 3 divisions west from the northern stick and pull tight and stick it in the MDF Base plate.

When the rope has been pulled tight to reveal the right angled triangle, it can be explained by counting the spaces on the rope, that the square of 3 is 9, the square of 4 is 16 and the square of 5 is 25.

Therefore the square on the hypotenuse (25) of a right triangle is equal to the sum of the squares on the other two sides $9 + 16 = 25$.

Pythagoras' Theorem.

You will notice brethren, I have been using the ratios of 3,4 5 throughout this demonstration, because these were some of the magic numbers that the teachers passed on to their pupils and through the ages tradesmen passed on to their apprentices.

These were the tricks of the trade, the secrets and mysteries that had to be guarded from interlopers, cowans or “cowboy builders”. Because in times past if you worked your family was fed and housed, if you didn’t work you literally starved.

So by knowing the secret of 3.4.5. a very easy secret to remember, meant that an operative stonemason using any form of unit, say the width of his hand or the length of his elbow to the tip of his middle finger, (a Cubit), could cut 3 lengths of timber into 3, 4 and 5 unit lengths, and then lay the lengths out to form a triangle. The corner of the three and four would then be a right-angle.

This procedure is so simple, that it is obvious why operative stonemasons would want to keep it secret from prying eyes.

Add to that the string and pebble for a verticle line, and other tricks of the trade picked up during an apprenticeship and the man had a trade at his fingertips.

In Freemasonry, the numbers 3,4,5 are **Symbolically** important in our ceremonies in a process known as circumambulation.

The candidate symbolically “Squares the Lodge” by being escorted around the Lodge, 3 times during the Entered Apprentice ceremony
4 times during the Fellowcraft ceremony
And 5 times in the Master Mason’s ceremony.

These numbers are particularly important in Craft Masonry.

We have

3 Degrees

3 Greater Lights (The VSL, The Square and Compasses)

3 Lesser Lights (The Sun, The Moon and The Master of the Lodge)

3 Moveable Jewels (The Square, Level and Plumb Rule)

3 Immoveable Jewels (The Tracing Board, Rough Ashlar and Perfect Ashlar)

3 Principal Officers

3 Assistant Officers

3 Moral Virtues, (Faith, Hope and Charity)

And 3 Regular Steps in Craft ceremonies

There are 4 Cardinal Virtues

(Temperance, Fortitude, Prudence and Justice)

And there are 5 Points of Fellowship.

Free and accepted Masons of the 18th century adopted the carpenters square as a symbol to illustrate a code of conduct.

That is the design of the IPM’s Jewel worn by WBro Fairhurst. (The Gallows Jewel)

The shorter arm represents **Integrity**, derived from the 3 moral virtues, **Faith, Hope and Charity**.

The longer arm represents **Sincerity**, expressed as the 4 social virtues; **Prudence, Fortitude, Temperance and Justice**.

We have seen how geometric principles form the basis for Operative Masonry and how symbolic or speculative aspects of the geometry form the basis for our moral and spiritual development, leading, hopefully, to a greater understanding of life and the Great Architect of the Universe.

It is appropriate therefore that an illustration of Euclid’s 47th Proposition should appear on the jewel of the Past Master. The jewel illustrates both the importance of the 47th

Proposition as the foundation of Masonry and the importance of Past Masters as the people responsible in the Lodge for ensuring that the moral principals represented by that Geometry are properly applied so that the spiritual building so erected is on a sure foundation, with intelligent purpose and admirable to contemplate.

In Freemasonry, the square worn by the Master is the symbol of moral perfection. It is the Master's duty to apply the Square of right and truth to the work of the subordinates, but a far higher responsibility rests on the Past Master to "PROVE" the square by ensuring that principles based on absolute truth and correctness are put to the test and used to **"build a superstructure perfect in its parts and honourable to the builder"**

The Immediate Past Master represents one who has erected such a building; but his having done so places him under a very great responsibility. That of ensuring that those who are working for the same end shall not fail because he has not set them a proper example, which has been put to the test and proven to be based on absolute truth and correctness.

I think you will agree Brethren that the Past Masters of a Lodge are vested with the greatest responsibility for maintaining and developing moral standards within the Lodge and assisting all members to attain them.

All of this is depicted in the jewel worn by them.

Acknowledgements

1. Euclid's Elements, Book 1, Proposition 47.
2. The Significance of the Past Masters Jewel, A.D. Mathews.
3. Euclid on the Square, C. Gavin.
4. The Meaning and History of the Jewels and Symbols of a Past Master, C.W. Davis.
5. How to Square your Square, Masonic Lodge of Education.

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