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### **THE ANTIQUITY OF GEOMETRY**

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In speculating about symbols, especially Masonic symbols, we are naturally led to think of geometric figures. Mindful of the frequently asserted claim that modern Speculative Freemasonry is the inheritor of the "secret tradition" or learning of the ancient priest-hood, who thereby exercised the decisive power of knowledge over their rulers and kings, we assume that these symbols were created or discovered by the learned men of the priestly class.

While that is undoubtedly true of many of the more complex and theoretical figures developed by ancient geometers, a little more speculation should lead us to the realization that the most ancient, the most primitive geometrical symbols used by homo sapiens were discovered and developed by ordinary men for very practical reasons. Without knowing it, the earliest scientific investigators were the original Speculative Masons, who "curiously traced Nature to her most concealed recesses" and thereby initiated the art of geometry, the one most revered by Freemasons.

And because they were the first discoverers of theoretical truths which had to be expressed in symbols (primitive language being completely inadequate, and the symbols being the practical techniques of their investigations:), they acquired a special advantage by which they were able to achieve unusual status and power.

Primitive man had to climb from a rude state of brutish survival on an individual basis to a simple state of social organization (like a group of families or clan, which could specialize to some extent by developing the practical arts of agriculture, the hunt for meat, storing surpluses, etc.), before he could allow the weak or the elderly to survive. It was probably such individuals who first had leisure to

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investigate to speculate, in the simplest possible form of that activity. But when their efforts gave them knowledge by which they were able to advise and direct the activities of the tribe, they realized its power and kept it secret to preserve their status and power. It was passed on only to disciples who were sworn to secrecy. The "secret tradition" was originally a practical necessity, for self-preservation.

Such a development probably occurred many, many centuries ago, long before the ancient civilizations of which we have any historical records. Nor did it come about quickly, in three or four generations. It must have taken millenia of puzzled observation and the slow accumulation of simple facts to arrive at even the crudest kind of symbol which encompassed more than an observation of shape or direction.

The sun and the moon have always been the foremost luminaries of nature influencing the lives of men on this planet. Both are round or circular in shape. Even the most untutored savage probably recognized a crudely drawn circle in the sand as a pictograph of these heavenly bodies. But since the moon

changes its shape regularly every month, it could be differentiated from the sun by representing it as a crescent, a shape in which it appeared much more frequently than it did as a circle.

The circle, therefore, became a universal symbol of the sun, because it was always round when it could be observed. And because it was obviously the one great heavenly body which brought life-giving light and warmth for the growing seasons, It became the first great object of wonder, cosmic fear, and adoration. In other words, it was man's first god; and the symbol of the sun, the circle, became the first representation to denote the divinity that shapes our ends.

But when the organization of human societies, even in their simplest state, made possible the survival of some of the physically weaker and elderly members of such groups, a "leisure class" came into existence, which had time to observe natural phenomena more closely, to investigate "the immutable laws of nature." - to speculate.

One of the earliest observed phenomena of the sun was probably its gradual change of position on the horizon at its rising and its setting. But not until this change of position was studied and noted with something akin to exactness ("scientific method") did primitive man derive some useful knowledge from his observations.

Among the oldest relics of man's initial science, the observation of the sun, are crude markings on stone which depict the arc of a circle formed by points equidistant from a central point of observation, probably marking the points of the rising or setting of the sun between the summer and the winter solstices.

Such an ancient monument as that at Stonehenge, England, is a highly refined and sophisticated representation of such solar observations. It's comparatively modern!

While it must have taken long periods of time to develop such a simple representation of the sun's journey from season to season, try to imagine the superstitious awe and wonder of the primitive sun-gazers when they began to realize that the circular sun was drawing a great circular arc on their earth's surface, that the great sun-god was recreating his shape right before them.!

And when they had amassed enough information to realize that the sun in its rising and setting always turned in the other direction at a definite time, repeated annually, they not only had knowledge which determined a beginning and end for certain seasons, they had "unlocked a secret of nature," which gave them power to advise and to regulate the lives of their neighbors and tribesmen. They had learned the hard way that "Knowledge is power"; and to preserve that power, they made it a secret among those who had been chosen to search for light. The circle, therefore, became the first and oldest symbol containing "wise and serious truths" for the "initiated."

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Probably one of their first achievements was to predict the summer and winter solstices. Undoubtedly they made these days significant and "sacred". They became a "priestly class". With their secret knowledge they established the earliest religious festivals, which Masons still observe as Saints John Day.

If this speculation is reasonable, we conclude that the circle was the first geometric figure constructed by primitive man. It was not merely a

drawing; it was literally a construction, resulting from arcs eastward and westward from a central point of observation, curved segments which resulted from joining the points which marked the sun's daily rising and setting from one solstice to the other.

If the central point of observation had been fixed by a pole or solid stone pillar, the shadow cast by that pillar from hour to hour gave the primitive observers a series of straight lines by which they could construct a whole circle of dots equidistant from the central point of observation.

What made the circle so sacred and mystic a symbol was the fact that it was a construction, not a mere representation of a shape, as if the fiery lord of the sky had revealed himself to the children of men, and thereby unlocked other secrets for the initiated to discover and to guard.

The lines which connected the stone-marked points where the sun arose and set each day, as well as the lines of the shadows created by the central stele or pillar as "the sun passed overhead each day", obviously created patterns of crossing lines which undoubtedly aroused the curiosity of these primitive "speculatives".

After generations of observers had been at work, there must have come a day when one of them recognized the symmetry of the crossing lines which created four right angles, the cross within the circle. Since that probably occurred when night and day were practically equal, the equilateral cross also became a sacred figure, fraught with special meaning and symbolism. And from that geometric construction, another "revelation from the All Highest", probably developed its use as a religious symbol, especially in festivals linked to the vernal equinox, when the dead seed was quickened into life again.

But the equilateral cross, one may surmise, was the second fundamental geometric figure constructed by the primitive observers of the sun; it resulted from their representations on the earth's surface of the lines drawn by the sun-god himself as he moved from east to west, or cast a shadow from the central point of their simple solar observatories.

As a figure, it probably first suggested the concept of space -especially as a direction. An equilateral cross drawn in a circle immediately suggests the directions in which natural phenomena take place, like the sun's passage across the sky, or the directions from which the four winds of heaven blow. As a simple but as yet undefined compass, it was a useful tool of knowledge, whose practical applications were veiled from the uninitiated, who were given mystical and supernatural explanations of the cross' meaning.

It was known all over the world, in the most primitive societies, from northern Europe to India, from China to the steaming jungle civilizations of Central America. Its frequent appearance in the religious symbolism of the Toltec and Aztec Indians of Mexico frightened the Roman priests who followed Cortez to the conquest of Tenochtitlan; and one of the principal reasons why they ordered the destruction of so many of the artifacts and records of these civilizations was their fear of a pagan cross.!

The cross assumed a myriad of forms, many of them having a speculative or religious symbolism, from the so-called Latin cross, on which Jesus was crucified, to the swastika (a good luck amulet),

to the Lorraine cross, with double or triple traverse, a symbol familiar to Masons of the Scottish Rite. One writer had identified 38 different crosses,

but the majority of them have little interest except for those engaged in the decorative arts and the science of heraldry.

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Most writers on the subject agree that the equilateral cross, like the circle, the line, the crescent and the triangle, forms so simple and natural a geometric figure that it must have been one of the earliest geometrical constructions which primitive man "stumbled upon" as a representation of the principal directions of space - the earth, the sky, the rays of light, the wind-rose, etc.

It naturally became a symbol of man with outstretched arms, of bird on the wing, of a double-headed hammer, of the bow and drill for making fire. But as a part of the esoteric knowledge of the most primitive scientists, the observers of the sun, it contained more meaning than a simple pictograph. It embodied concepts of radiation or space. As a symbol of the rays of the sun, it veiled knowledge of the use of these lines in solar observations and became a symbol of "the tree of life" on which depended the death and renewal of life resulting from the annual changes of the seasons.

However, if primitive man, by simple geometric constructions, discovered the knowledge whereby he could predict the solstices (by the circle of stones of his solar observatories), sooner or later he must have run into the problem of measuring time, i.e., how to count by using units of time. The day was undoubtedly the first unit he used, since the sun automatically measured it for him, - and the sun was the object of his study and veneration. A day, moreover, was a lapse of time which he could remember in his first attempts to classify and to store information for future use.

But it is extremely doubtful that he originally had either the language or the mental capacity to count quantities as large as the number of days between the summer and winter solstices, even though he had arranged a stone for each day on the solar circle which he had laid out on the ground. He had learned by generations of observations that when the rising sun touched one end of the arc, it was the first day of summer, and that when it touched the other end, the sun would turn again and seek each day a more southerly point of arising. But that he had a language of numbers by which to express that extent of the passage of days, one may seriously question.

We know, however, that primitive man used numbers to indicate quantities; but the records they have left on stone suggest an ability to use only the simplest, the rudimentary numbers suggested to them by the ten fingers on their hands and the ten toes on their feet.

Among their chiseled records on stone, the numbers found most commonly are five, represented by five strokes attached to a stem (the hand), and a rake-like figure consisting of a bar from which depend seven short strokes, a representation of the number seven.

Whence came that particular number, which in subsequent civilizations and religions was especially revered? Was its very antiquity one reason for its universal importance?

Why are there seven ages of man, and seven liberal arts?

Why are there seven gods of happiness in Japanese folk-lore?

Why were there seven sages in the folk-lore of ancient Greece?

Why did the Sioux Indians have seven council fires?

Why did the Romans boast of the seven hills on which their "eternal city" was built?

Why is the number seven so frequently used in the Bible, especially in the Old Testament?

And why does the week have seven days?

The following speculation is offered with no proof whatsoever, it is sheer guesswork to suggest a possible reason why the number seven became so important in the intellectual and cultural development

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of mankind. It was a mystic number because it was one of the earliest discoveries of the primitive scientists, the observers of the sun. It was a primordial unit to measure the passage of time which resulted from the earliest discoveries that "God is always geometrizing".

If the year was a concept involving numbers of days too large for the mind of primitive man to handle, he probably turned to observations of the other great luminary in nature, the moon, to observe the passage of time.

This heavenly body made a shorter revolution relative to the earth. By adding a stone each day to a little pile to mark the passage of time between the beginning and end of the moon's revolution from perigee to perigee (its closest point to the earth), the primitive observer could have discovered the lunar month, a period of approximately 28 days. This was probably his first unit of measure for a period of successive days; it seems to have been the unit of measure which earliest man used in computing ages. This is why Biblical patriarchs were credited with such phenomenal ages, like the one ascribed to Methuselah. He lived to be 969 "lunar years" old; but in reality, only about 75 solar years by our reckoning. Even that was a "ripe old age" for his time !

But whence came the division of the lunar month into weeks of seven days? It is easy for us to observe that a week is one-fourth of a lunar month of 28 days, but the primitive observers of the heavenly bodies possessed no mathematical skills to perform an arithmetical division.

May it not have come to them from their efforts "to trace nature to her most concealed recesses"? From the geometric constructions which they had already mastered as suggested heretofore? If new knowledge is derived from new experiences which are related to former knowledge and experience, especially if some method of recording it had been found, may not their "discovery" of the week as a unit of measure for the passage of time have come from their geometrical constructions in their solar observatories?

Having learned that the sun-god revealed his secrets to their inquiring minds whenever they drew designs upon their trestleboard, the earth, they probably extended their constructions on the figures of the equilateral cross within the circle. They probably learned to connect the four ends of the cross to form a square.

At some point one of these earliest researchers probably used the common measure of ten to fix the length of one line of the cross, which also revealed that one-half of the line, a radius of the circle, was five. But then, when he measured the line from one end of the cross to the end of its adjacent arm (the

side of a square inscribed in the circle), he found it to be seven, since he probably paced off the measurements, having no exact instruments available. (The 47th Problem teaches us that the side of the square in such a figure is approximately 7.07) but if a normal pace of 36 inches had been used by the primitive measurer, the difference of less than two and a half inches was probably not apparent, since the seven paces would rarely be made with equal regularity.

But, by applying his measurement to the four sides of the square, the ancient geometrician discovered that the number of units in the perimeter of the square equaled the number of days he had learned to count out for the lunar month!

By observation he had long since learned that the month is characterized by four changes (which we call the "phases of the moon"), and here was a four-sided geometric figure whose sides measured 28 units (the same as the number of days in a lunar month) whenever he started his measurements of the lines of the cross with the number of fingers which the Creator had given him! And since both the square and the moon had four equal phases, he must have marveled at the coincidence.

In fact, it was probably so startling to the primitive investigator that he instinctively attributed it to  
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"divine revelation"- the kind of knowledge he had first acquired by his observations of the sun! Once more the All Highest had revealed a portion of his wisdom to the children of men; and so, once more the ancient learned men proclaimed to their tribesmen and kindred: "The Lord of Heaven hath declared unto us; 'Henceforth ye shall divide the month into four periods of seven days each.' Let the Lord's will be done."

Fanciful? Of course. Guess work, Naturally. Speculative? Absolutely.

All scientific or "theoretical" knowledge began somewhere and somehow. Geometry is one of the oldest of man's sciences, it is generally agreed. In such a possible discovery of the relationship between five and approximately seven in the arms of a cross and a square drawn to connect these arms, may we not be speculating on the first use of the 47th Proposition, long before it was theoretically examined and proved? Furthermore, that relationship foreshadows the discovery of the fact that the diagonal of a perfect square is the side of a perfect square having twice the area of the first one. Some modern writers believe that that ratio was the fundamental ratio used by the architects of Ancient Egypt, Asia Minor, and Greece in designing and constructing these "works which are the admiration of every age."

"We work as Speculative Masons only." If you must have a "practical" reason for listening to a disquisition like this, let it be a reminder that by speculating on the long and agonizing process by which man developed his intellect and spiritual insights, as imperfect and limited as they still undoubtedly are, we may increase our respect for man and his potentialities. That same realization can also help to strengthen our faith in the ultimate purpose of our society, - to search for wisdom and light, and by adding light to light, to make men wiser and consequently happier.