

"THE SCIENCE OF GEOMETRY" by

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The term "Masonry" can be used in a wider sense as meaning any peculiar system of morality veiled in allegory and illustrated by symbols; or, in the narrower sense, as indicating the particular system which Freemasons operate to-day. The former is as old as civilisation; the latter, as far as dependable evidence goes, is not more than three hundred years old. Attempts to trace our system further back have always seemed to me to involve rather a strain on scanty and ambiguous evidence.

Secret societies are older than civilisation, but we find considerable evidence that in the oldest civilized societies of which we have any sure knowledge there existed (1) secret societies teaching a moral code on the basis of mathematical analogies, and (2) societies of operative craftsmen; though, as far as can be seen, there was no connection between these bodies. Egypt is the oldest civilization of which we have any such sure knowledge, its records running back over approximately eight thousand years. It is here that we find evidence of the first recorded system of morality based on geometry, and this is referred to in our lecture on the First Teaching Board. It has been found that the liberal arts and sciences developed not haphazard, but in a determinate order; the more abstract, exact and mathematical, with their applied arts, developing first; so that in ancient times there was a comparatively advanced development of geometry, astronomy and the arts dependent on them; and, in those times, to exhort any person to study geometry was equivalent to exhorting him to be a well-educated man, because most knowledge at that time took a mathematical form. In Egypt this would be facilitated by the fact that the geographical configuration of the country is flat and uniform, and that the Egyptians were vitally concerned with certain public works such as irrigation, surveying, river control, and the building of canals, aqueducts, pyramids, and so on, that would



demand a fairly high development of applied mathematics. It is not surprising, therefore, that in Egypt we find (1) an elaborate ritualistic secret cult illustrated by geometry, and practised by a governing priesthood, (2) a great development of operative Masonry on the large scale, and (3) at least some evidence that such operatives had some choice of occupation, and were organised into some form of guild or union. It is a mistake to suppose that skilled artisans in antiquity were slaves in the modern sense of the term. There is no evidence of any connection whatever between these operative cults or unions and the geometrical cults of the priestly class.

At one stage of development Egypt was the intellectual centre of the ancient world, and to its colleges young men flocked from the Greek and other cities, just as they now go to such centres as Oxford and Cambridge. In this way the geometrical cults spread from Egypt among certain sections of the Greek intellectual population.

Greek civilisation, too, was very largely preoccupied with building problems, and we know that the operative artisans in Greece had guilds with secrets and code words. It is probable, though not certain, that these originated independently of Egyptian influences.

At this point evidence of a mystic geometrical cult fades out, and there is no reason to suppose that the influence was transmitted through Greece to Rome, although operative guilds of working Masons were found in Rome and its provinces, and traces of them have been discovered in Roman Britain and Gaul. From this time, about 400 B.C., until after the close of the eleventh century, there is very little evidence to base any conclusion upon.

We then find abundant evidence of the extension of operative guilds during the cathedral building period of the Middle Ages. The workers on these edifices were highly skilled men, organized on the exclusive guild basis of the Middle Ages, and

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-3-

entry to the trade was restricted to qualified craftsmen. The guilds of cathedral builders had to move to their work in various parts of Europe, and as the bulk of builders in those days could not read or write, a system of secret signs, tokens and code words grew up to enable operative Masons to prove themselves across the barriers of different languages, and that took the place, to some extent, of the modern union card. Since these Masons were travelling workers, they were called "frank" or "free" Masons, because they were free to move at will from one jurisdiction to another. By the end of the Middle Ages the cathedral building impulse was spent. The guilds began to lose their operative functions, and to develop a spectacular side. This spectacular side gradually became their most important function, and we find them developing pageants to enact Biblical scenes, such, for example, as the building of the Ark, and the building of King Solomon's temple. The significance of this development will be clear to every present Mason.

By Stuart times the rift in Christendom had definitely ended the cathedral building period, while national industrial legislation was taking over the functions of labour protection formerly exercised by the guilds, whose meetings became perfunctory and ceremonial. At some time during the seventeenth century it began to have become the practice to allow outsiders to be admitted to look on (the word "speculator" originally signifying an onlooker). As the century wore on, the operative side faded out completely, all that was left of it being symbolical reminders such as working tools, the ashlar, aprons, and tracing boards. This was about the position at the end of the seventeenth century, and it is just a few years after this time, namely, during the reign of Queen Anne, that we find speculative Masonry as we know it practically holding the field. It is probable that the ritual, as we know it, was one of the latest developments, and was very likely unknown to the operative artisans of the earlier period. A textual examina-

-4-

tion of the present ritual seems to indicate that it speaks in the rather stilted literary voice of the beginning of the eighteenth century. It is not possible to be completely certain as to the details up to this period, but in broad outline the evidence supports the suggested development as I have outlined it. In particular, there seems no organic relationship or stream of unbroken tradition connecting modern Masonry, as we know it, with the secret codes of the ancient world; but that our speculative system was grafted on to the survivals of mediæval operative cults seems a very probable supposition.

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It was not for some time after the writer was made a M/w that he began to realise the significance of Geometry in the Craft ritual. Of the seven Liberal Arts and Sciences, six were obviously of value, but Geometry was something of an enigma. In common with the majority, no doubt, he had forgotten most of what he had learned at school on this subject, but the emphasis laid on it as the basis of our Art, impelled him to refer to it again from a new angle.

The dictionary defines Geometry as the Science of Magnitude, whether linear, superficial or solid, with their properties and relations in space. This then must be the science on which the universe was founded.

The Halliwell Ms. written in the fourteenth century and discovered in 1839, attributes the discovery of the science to Jabal son of Adah and Lamech, and states that it was first practised at the building of the Tower of Babel under Nimrod, King of Babylon. However that may be, it is certain that our first knowledge of the science originated in Babylon, and was carried to Egypt, where it was perfected by Euclid, and set down in Thirteen books.

The first book deals with Triangles, the second with Squares, and the third with Circles; whilst the seventh, eighth and ninth deal with the properties of numbers. The significance of these six books is emphasised by those who claim that Geometry was Masonry, and Euclid the great teacher. They point out that the first three books are symbolised in the three craft ceremonies. The First Degree is remarkable throughout for its triune nature symbolising the triangle. The Second Degree is mainly concerned with the square in its many applications, whilst the Third Degree deals with the circle. The seventh, eighth and ninth books are symbolised in the innumerable sequence of threes, fives, sevens and their common factors throughout the ritual.

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The following points are of interest: In the First Degree which is triangular, the I.G. gives three reasons for the admission of the C. who then enters between two deacons (three again). He makes three steps to the Ped, takes his O. beneath the crossed wands of the deacons and with them forms a triangle, and is finally invested with his apron, having a triangular flap. Brethren will recognise many geometric symbols and sequences of three in the ceremony whilst the Lodge itself is stated to be in the form of a Parallelepipedon. The dictionary defines this as a regular solid bounded by six parallelograms, the opposite pairs of which are parallel. "Pipedon" is derived from the Greek "epi" - "upon" and "pedon" - "the ground".

In the Second Degree he is announced with three, admitted on the S. which is an angle of 90 degrees, and then takes five steps to the E. and makes five S. with his body while taking the O. The special significance of this Degree is the study of the seven Liberal Arts and Sciences, especially Geometry, this latter particularly applying to obedience to the laws of T.G.G.O.T.U. inscribed in the V.M.L. In the F.C. Sn he makes two more squares.

In the T.S. we have the W. St. - c - se (the first reference to a circle) with its three, five, seven or more steps, having reference to the three who rule a Lodge (Body, Soul and Spirit which constitute Man) five who form a Lodge (the five senses of Man) and seven Liberal Arts and Sciences. There are, of course, other allusions.

Another interesting point about the Sq. is that if four right angles are joined together with the angles inward, an equal armed cross is formed. This cross has many meanings, one of which is that it represents the earth or matter, just as does a four sided square.

In the Third Degree the Can. is admitted on the S & C. The compasses being the instrument with which the Geometrical figures are constructed, more especially the Circle, enables us



by means of two circles, (i.e. by joining the centres to one intersecting point of the circumference) to form the triangle. This represents the Triune nature of God, while the circle itself is the emblem of eternity and of the Spirit. At the centre of the circle rests all knowledge; in other words the Divine Spirit resides at the centre of the circle of the infinite. No matter how far one leg of the compasses is extended, the other must always be at the centre, thus the centre is the point within a circle from which a M/m cannot err.

The first proposition in Euclid referred to in the previous paragraph also enables us to form two triangles which in this degree are represented by the position of the S & C. on the Ped.

In this degree the mystic numbers are again much in evidence, the most important being the seven S. to the E. the first three of which make the cross once more; they also undoubtedly refer to the three entrances to the temple through which H.A.B. attempted to escape. The seven in all form a combination, the first three symbolising the Trinity and the remainder the four Elements representing matter. Yet another combination of similar import is later made by the W.M. and the two Wdns, who form a triangle and by the two Wdns. and the two Dens. forming a square when about to illustrate the D - of H.A.B.

In addition to the ceremonies there are the geometrical allusions on the apron to which I have referred in a separate paper, but there is one other of importance in the P.M.'s jewel. This jewel has a representation of the 47th problem of the first book of Euclid, which enables a square to be obtained without the use of compasses or any instrument other than a 24" gauge to provide a unit of lineal measure, the symbolism being that the wearer has, or should have, a complete understanding of our system and its several parts.

In conclusion the geometrical signs used in our ceremonies may be symbolised as follows :-

The Triangle represents the Trinity of God, the triune nature of man (Body, Soul and Spirit) and the elements of fire and water.

The Square represents the four elements of matter, the earth and moral rectitude.

The Circle represents Infinity and the Spirit of God.

The Tee or tau cross, represents masculine nature.

The Square & Compasses forming the Lozenge, represent the Vesica Piscis or Feminine Nature.

The 47th Problem represents the complete understanding of the whole system and its several parts, whilst the

Laws of Geometry symbolise the laws of T.O.O.O.F.U. as laid down in the V.S.L.

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