GEOMETRY

W. Robert Ellis

Printed in the Masonic Home Journal, June 1968

I have always been intrigued by what Masonic literature says about Geometry. In Pirtle[1], for example, it is said that "Geometry, or the application of arithmetic to sensible quantities, is of all the sciences the most important."

Mathematics has as much to do with philosophy, economics, military strategy, musical composition, artistic perspective, and so on, as it has to do with atomic physics. Because of its virtuosity, anyone well taught in it can love it with the same warmth that a devotees feels for the ballet, fine silver, antiques, or any other adornment of civilization.

Our civilization would scarcely exist without the physical laws and intellectual techniques developed as a by-product of mathematical research. No one can balance his checkbook without applying arithmetic invented by the ancient Mesopotamians and Hindus. No one can build a wall without drawing on techniques of geometric measurement developed by Egyptian mathematicians.

It was Greek pioneers of geometry who conceived the idea that the earth might have the shape of a sphere. Classical mathematics, when rescued from the oblivion of the Dark Ages, helped ignite the adventurous spirit of the era of Columbus.

Today, atomic research draws heavily on Einstein's Theory of Relativity, which in turn utilized abstruse 19th century speculation about geometry. The two pillars of mathematics in antiquity were arithmetic, the science of numbers, and geometry, the science of shapes and spatial relationships. Over the centuries, arithmetic was augmented by algebra, which provided a shorthand notation for doing arithmetic when unknown quantities were involved.

Since I first gave the Stair Lecture more than forty years ago, and conferred the Fellowcraft Degree in the same year, it has excited my quest, not only for Masonic knowledge, but has increased my wonderment over the attributes of the Almighty.

The lectures on the science of geometry are to me the most beautiful yet devised. Let us go back to what the Master says to the candidate after his admission to the Middle Chamber:

"Geometry, the first and noblest of sciences, is the basis upon which the superstructure of Freemasonry is erected.

[1] Henry Pirtle, 1887-1955, author of **The Kentucky Monitor**.

"Regarding man as a rational and intelligent being, capable of enjoyment and pleasure to an extent limited only by the acquisition of useful knowledge, our Order points him to the study of the liberal arts and sciences and to the possession of knowledge as the most befitting and proper occupation for the God-like endowments for which he is gifted.

"Indeed, all who frequent our Masonic Temple are charged to labor faithfully in the wide and unbounded field of human improvement, from which they are assured of reaping a most glorious harvest, a harvest rich in happiness to the whole family of man, and in manifestation to the goodness of God. Your attention is especially directed to the science of Geometry, no royal road, 'tis true, but to one prepared with an outfit it must prove more attractive than palace walks by regal taste adorned.

"The ancient philosophers placed such a high estimate upon this science that all who frequented the groves of the Sacred Academy were compelled to explore its heavenly paths, and no one whose mind was unexpanded by its precepts was entrusted with the instruction of the young. Even Plato, justly deemed the first of the philosophers, when asked as to the probable occupation of Deity, replied, 'He geometrizes continually.'

"If we consider the symmetry and order which govern all the works of creation, we must admit that geometry pervades the universe. If, by the aid of the telescope, we bring the planets within the range of our observations, and by the microscope view particles too minute for the eye, unaided to behold, we find them all pursuing the several objects of their creation in accordance with the fixed plan of the Almighty."[2]

In the 13th century, Thomas Aquinas stated a fundamental truth of aesthetics: "The senses delight in things duly proportioned." St. Thomas was expressing the direct and very often measurable relationship that exists between beauty and mathematics, a relationship that applies to both natural beauty and man's art.

It appears that nothing in nature is so small or seemingly insignificant that it does not merit a pleasing symmetry, as is evidenced by the simple morning-glory buds, for example, which you will see formed into two trim spirals. Furthermore, there are numberless other examples – the endlessly embellished hexagons of the snowflakes, the lovely geometric spiral of the chambered nautilus, the perfect cubes found in mineral crystals. As for man, himself a remarkably symmetrical creation, he appears to react instinctively to forms which follow rigid geometrical rules – both in what he see around him and in his own creative acts of art and architecture.

Take a diagram of the head of a daisy, for example. It will reveal, upon close inspection, the double spiraling. There are two opposite sets of rotating spirals which are formed by the arrangement of the individual florets in the head. They are also near-perfect equiangular spirals. If you were to count them, you would find 21 in the clockwise direction and 34 in the counter-clockwise direction.

[2] The Kentucky Monitor, Henry Pirtle. From the "Letter G Lecture," Fellowcraft Degree.

Amid the fascination with mathematics in the Renaissance, painters became more aware of geometry's vital role in achieving optical perspective – the quality which gives painting a three-dimensional depth. Until then, painting had been primarily "conceptual," with the most important subject given most prominent treatment. The word "perspective" derives from the Latin "seen through" – reflecting the concept that a picture with optical focus was really a geometrically governed "window space."

So, to get back to Pirtle, "By Geometry we may curiously trace Nature through her various windings to her most concealed recesses. By it we may discover how the planets move in their respective orbits and demonstrate their various revolutions; by it we account for the return of the seasons and the variety of scenes which each season displays to the discerning eye; by it we discover the power, the wisdom and the goodness of the Grand Artificer of the Universe, and view with delight the proportions which connect the vast machine.

"Numberless worlds are around us, all framed by the same Divine Artist, which roll through the vast expanse and are all conducted by the same unerring law of nature. Is there not more truth than fiction in the thought of the ancient philosopher, that God geometrizes continually?

"By geometry, he rounds the dewdrop, points the pyramidal icicle that hangs from thatch-bound roof; bends into a graceful curve the foaming cataract; paints His bow of beauty on the canvas of a summer shower; assimilates the sugar to the diamond and in the fissures of earth-bound rocks form gorgeous caverns, thick-set with starry gems. By it, He taught the bee to store honey in prismatic cells; the wild goose to range her flight, and the noble eagle to wheel and dart upon its prey, and the wakesome lark, God's earliest worshipper, to him its matin song in spiral flight. By it, He forms the tender lens of the delicate eye, curves the ruby lips and fashions the swelling breast that throbs in unison with a gushing heart. By it, He paints the cheek of autumn's mellow fruit, forms in molds of graceful symmetry the gentle dove, marks the myriad circles on the peacock's gaudy train, and decks the plumage of ten thousand warblers of His praise that animate the wooded shade.

"By it, He fashions the golden carp, decks the silvery perch, forms all fish of every fin and tribe that course the majestic ocean, cut the placid lake or swim in gentle brook. Yes, more, even the glassy element in which they dwell, when by gentle zephyrs stirred, sends its chasing waves in graceful curves by God's own finger traced in parallel – above, beneath, around us, all the works of His hands, animate an inanimate, but prove that God geometrizes continually.

"But if man would witness the highest evidence of geometrical perfection, let him step out of the rude construction of his own hands and view the wide, o'er-spreading canopy of the stars, whether fixed as centers of vast systems or all noiselessly pursuing their geometrical paths in accordance with the never-changing laws of nature.

"Nay, more, the vast fields of illimitable space are all formed of an infinitude of circles traced by the compasses of the Almighty Architect, whose every work is set by the level, adjusted by the plumb and perfected by the square. Do this, my brother, and you must admit with Plato, that God geometrizes continually, and be assured with Job, the He who stretched the earth upon emptiness

and fixed the foundation thereof upon nothing, so it cannot be moved, can bind the sweet influence of Pleiades or loose the bands of Orion."[3]

What poetry – even if it is written in prose form!

If we declare that God geometrizes continually, we might even consider the cell. Physicians will tell you that even the most primitive cell is an immensely complex and highly integrated piece of biological machinery in which every part plays an indispensable role in the maintenance of life. We talk of the sun, the source of light and life. Cells, however primitive, perceive cosmic forces and respond to them through mechanisms which are not yet understood. To go into this just a little further, there is no life without cells. The microscopic blob of jelly called the cells is a remarkable entity. The most remarkable thing about it is the very fact that it is alive – not with a murky primordial glow, but as fully and vibrantly alive as a tiger in an oak tree.

In a remarkable miniaturization of life's functions, the cell moves, grows, reacts, protects itself and even reproduces. To sustain this varied existence, it utilizes a tightly organized system of parts that is much like a tiny industrial complex. It has a central control point, power plants, internal communications, construction and manufacturing elements. These basic cell components, common to cells which otherwise vary enormously in size and function.

Let's take the brain, for example. In the spongy lump which must weigh two pounds or more, there are massed some nine-tenths of the body's ten billion nerve cells. The brain is the most compact computer known. Within its convoluted folds is an untidy, microscopic jungle of tangled dendrites and axons which crisscross one another in a vastly complicated switchboard of interconnected circuits. A single neuron may be in direct communication with as many as 270,000 of its neighbors.

Finally, where it exists, life is a product of starlight. All life on earth feeds on radiation coming from a yellow and middle-aged star which we call the sun. The energy of sunlight becomes life through the mediation of plant and animal cells.

The essential operation involved consists of changing energy from one form to another – specifically, transforming radiant energy from the sun into the chemical energy which enable the single cell to thrive and multiply, the tree to flourish, the tiger to stalk its prey, and man to write his history in the stars.

You may be thinking I have wondered far afield, but I have a point in bringing this to your attention. It all relates back to geometry and universal laws, so many of which the most advanced scientists still have not learned.

But let us go back to the Lodge, and perhaps we can arrive at a means of establishing who, how, and what we are.

[3] Ibid.

In speaking of the Letter "G" and all its implications, I always have been duly impressed by the admonition of the Master, in declaring that the Letter "G" is "a perpetual condemnation of profanity, impiety and vice. No brother who has in his heart bowed that emblem can be profane. He will never speak the Name of the Grand Master of the Universe but with reverence, respect and love. He will learn, by studying the mystic meaning of the Letter "G," to model his life after the Divine Plan, and, thus instructed, will strive to be like God in the activity and earnestness of his benevolence and the broadness and efficiency of his charity."[4]

[4] Ibid.