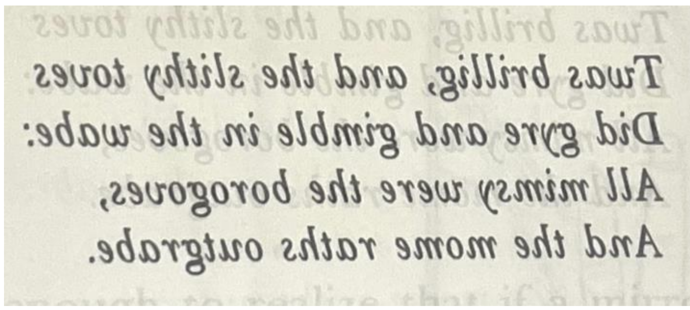
Introduction

“Just after Alice had entered the Looking Glass room, she opened a book on the table and came to the world's greatest nonsense poem. This is how the first stanza was printed.


Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

Alice was clever enough to realize that if a mirror reflection is reflected, it is the same as if not reflected at all. “Why it's a Looking glass book, of course, she exclaimed. And if I hold it up to a glass, the words will go the right way again”.” From a continuation of Alice’s adventures in Lewis Carroll’s *Through the Looking Glass*.

The issue of handedness became apparent to me early in my life with dyslexia. In second grade, we had handwriting class, and since I was left-handed, I learned to write right-handed in class. However, whenever I wrote by myself, I reverted to using my left hand, which led to punishment in third grade. My teacher, Miss Nichols, was strict and carried a ruler for discipline. If she saw something she didn’t like, we would get a good whack. After that, I became a right-handed writer. Still, in high school, my best bowling games were left-handed. In boot camp, my dyslexia caused me to mix up left and right so often that my drill sergeant made me carry a rock in my left hand.

Handedness came up again during my senior year in a physical-chemistry class. The quantitative analysis of a compound we were given resulted in everyone getting half of the expected amount. After we realized that the molecule was a left-right stereo isomer; my lab partner discovered the solvent that would absorb both isomers and I found where to use it, making a positive outcome for this issue of handedness.

Later, I revisited this issue in Martin Gardner's *The New Ambidextrous Universe,* where he presented the Ozma Problem. This hypothetical scenario involves receiving a message from an advanced extraterrestrial civilization asking, "What do you mean by left and right?" Communicating through pictures would not solve the problem because we would not know if the images they displayed were left to right or right to left. Orientation makes the difference, so how this paper is written attempts to solve this problem. We use a left-handed justification for the text because a left margin is defined to be on the same side as our left side. Then we consistently try to keep the order so left-handed comes first in this text. The exception is when we are talking about anti-matter, then right-handed comes first. Finally, all the images are mirror symmetric, with the left-handed image kept on our left side. That way, no matter what choice they make in displaying the image we know what they see.

In the image in figure 1, the two spherical tetrahedra are duals, objects that result when a dot is put in the center of its faces and then the dots are connected. In the past, the tetrahedron was considered a self-dual.

However, the image shows two distinct forms, the one closest to the justified margin is left-handed and the one closest to the unjustified margin is right-handed. These two forms are not superimposable. They are mirror images that do not align with one another, even if you try to rotate or flip them. These concepts open a portal to a new form of spherical mathematics based on the Platonic solids and the *I Ching*. *The Book of Change* is another name for the *I Ching*. The premise in our book is that the 8 trigrams and 64 Hexagrams represent solutions over a unitary sphere to polynomial equations when they are considered to be unitary diagonal square matrices. Additionally, we show that the group **G64** Is the master group for the Platonic solids. We promise to demonstrate this premise inside the book. One of the reason why our published journal images are not correct is the Identity for the observer needs to define the observer's viewpoint as that of the one who is looking at the image or object. As the observer, we need to see the backside of the defined observer. In figure 1, the image below shows the observer looking at us.

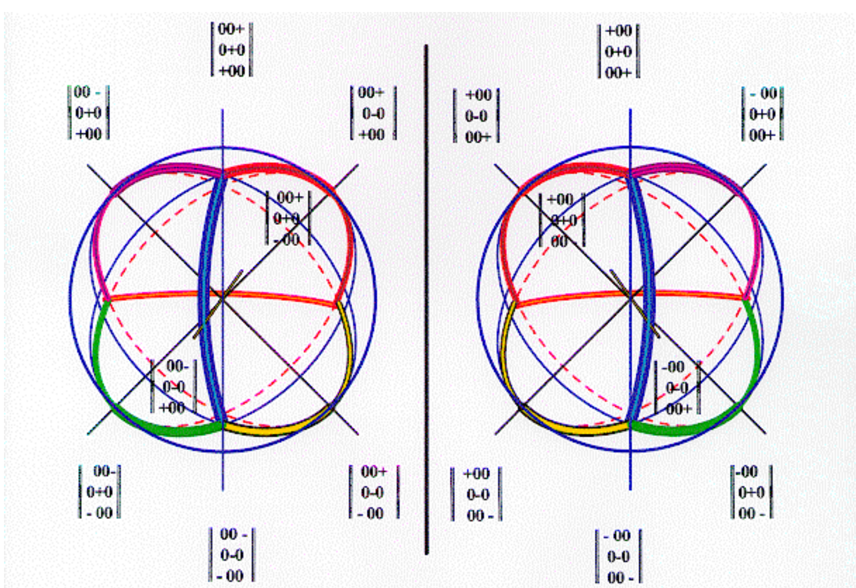


Figure 1

We give a geometric meaning to the secondary diagonal of a matrix, linking it to imaginary numbers, numbers that are multiples of the square root of -1, used in advanced mathematics. Because there are two different forms of the tetrahedron, we suggest that there are six Platonic solids, grouped into three pairs of duals. Using group theory, we incorporate an observer into the mathematics with the identity element and a tetrahedron. In a Euclidian model, the tetrahedron is a three-dimensional shape with four triangular faces. The vertical line that faces you divides the surface into a left and a right triangle corresponding to your left and right side. When you rotate the tetrahedron 180°, it is now dividing the surface into an upper and lower triangle corresponding to the back of your head and feet. Our goal is for the observer to share the same orientation as the viewer of the images on this page.

A matrix is a rectangular array of numbers called the elements of the matrix. The vertical entries are the columns, and the horizontal entries are the rows. A square matrix has the same number of columns and rows. In a unitary diagonal square matrix, all entries are zeros, except those on the main diagonal. For the matrix close to the unjustified edge, it starts with the entry in the upper corner near the center mirror line and ends with the entry in the lower corner[29]. The secondary diagonal, represented by the matrix close to the justified edge, represents a mirror image and imaginary numbers. It starts with the entry in the lower corner near the justified edge and ends with the entry in the upper corner. All the diagonal entries are plus ones or minus ones. Additionally, the diagonal forms may be written in a linear array (Z_2,..., Z_2), where Z_2 = +/- 1. The linear array of a secondary diagonal starts with a negative sign, **-** (Z_2,..., Z_2).

Group theory is a branch of mathematics that studies symmetry and how objects can be transformed. Matrices are grids of numbers used in mathematics to represent transformations or movements. Together they both describe transformations and are used in constructing this mathematics. We show that matrices also have a dual form that mirrors one another.

$$\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix} \qquad \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

In the dual image of matrices above, the matrix that is closest to the unjustified margin, represents the identity element. In the dual vector field, the left-handed tetrahedron is isomorphic, which is a one-to-one relationship, to the field of the right-handed tetrahedron. The left-handed tetrahedron is closest to the justified margin and the matrices are those of the secondary diagonals. The identity matrix doesn’t change anything when multiplied with another matrix. The identity matrix defines an observer’s original orientation to be the same orientation as those who are reading this introduction. Matrices are used to label the points on the complex hypersphere represented as a bubble. . A spherical bubble models the six-dimensional complex hypersphere. It is complex because there are twosides to the membrane doubling the number of dimensions to six, three inside and three outside.

In nature there exist objects which, in all respects, are identical, except for their *six-dimensional* spatial orientations. This chiral property is known as handedness or enantiomorphous, and the difference between a person's two hands best represents the concept. We first modeled this idea with figure 1, mathematically over a complex hypersphere, which accommodates simultaneous mapping of interrelated systems of coordinates. The complex hypersphere is defined by the left-handed system of coordinates **G*8**. It is the tetrahedron **in the mirror**, defined on the inside surface, and labeled algebraically, with secondary diagonal matrices. **G8** is the right-handed tetrahedron that is defined algebraically, with main diagonal matrices, over the outside surface of the three-sphere. The dual vector field **G*8** is created when the mirror demonstrates the inversion of **G8**. Multiple dimensions unify the left-handed and the right-handed coordinate systems, by defining the left on the inside surface. The difference between left-handed and right-handed systems is defined here so that the x-axis is directed to the left and the y-axis to the right, then the z-axis points towards you and defines a right-handed coordinate system. If the z-axis points away from you, it is a left-handed system. The systems mirror each other, which is the key to their unification.

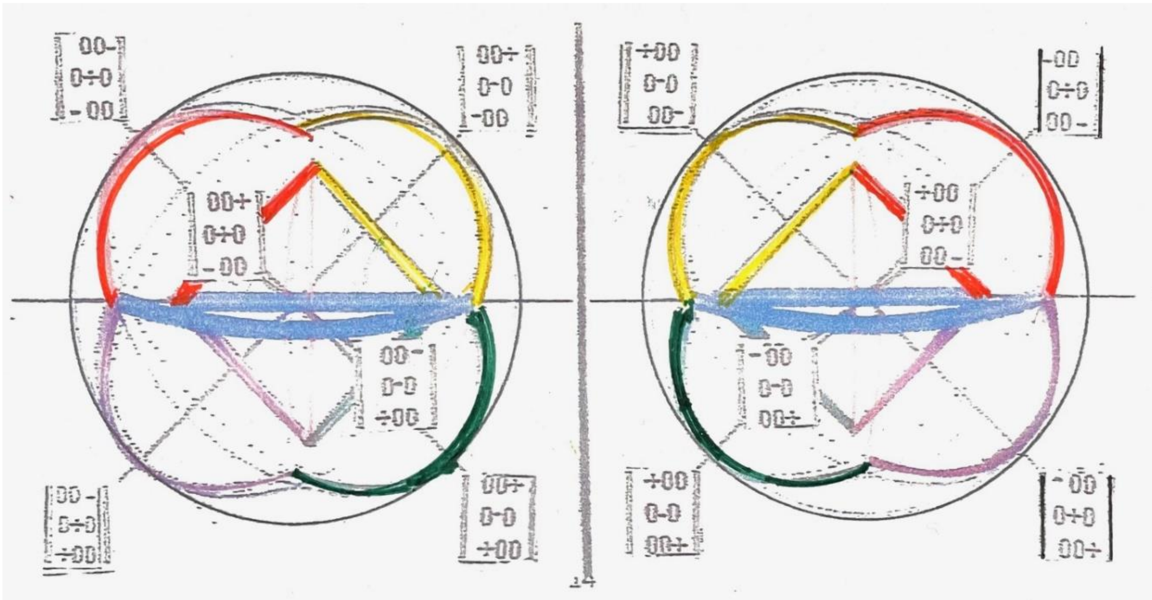


Figure 2. *The updated images are of the observers orientations that illustrate a left-handed tetrahedron and its chiral image projected upon a complex hypersphere. The matrices have also been corrected and the heavy line between them represents a mirror.*

In Figure 2, the familiar vector fields are now labeled with unitary diagonal matrices that commute,(x,y,z). Unlike the two-dimensional Euclidean plane, the resultant of an action on the three-sphere is equally dispersed over the two additional dimensions; because of this when one moves from the identity position to the x position both the y and z change, (+1,-1,-1). The diagonal of a matrix is known as the trace. When the elements of the trace are multiplied together, the answer is the determinant. The determinants are all positive for the x-axis, the y-axis, (-1,+1,-1), and z-axis, (-1,-1,+1). This is the desired result that corresponds to how we define the left and right-handed coordinate systems. The framework offers a consistent method for understanding handedness and symmetry, both in mathematics and in nature.

The inclusion of an observer in the mathematics is one of the most important developments of this mathematics. Let's imagine. that a right-handed tetrahedron is constructed on a large plexiglass sphere. Now an observer on the inside surface of the sphere and located diametrically opposite the outside observer will see a left-handed tetrahedron, as seen in the mirror. Additionally, the inside observer will see the matrices as those of the secondary diagonals. The matrices are located directly underneath the outside matrices. This is the same view as if you painted them on the outside of the door and then looked at them from the inside. They are backwards and left and right have been interchanged.