THE PATTERN OF A NEW SCIENCE

This pattern consists of a single fundamental proposition called omega (Ω) and a single postulate called alpha (α).

There are two types of products in this science: the omega products defined by:

$$ab:rr$$

and the alpha products defined by:

$$a\cdot r$$

The quantities ab and rr in the omega product are called raw tinsars. The : in the omega product is that of double multiplication, and the • in the alpha product is that of single multiplication.

The omega proposition is a proposition of dissolution: splintering omega products into the sum of alpha products. By its act one goes from a state to a simpler state, not necessarily from a more complex to a more simple. Presently a statement in algebraic symbols of the omega proposition and a statement of the alpha postulate will be given but before that is done more explanatory statements must be made.

History teaches, and I believe it, that creative geometry and the progressive march of civilization have always gone hand in hand.

Every really new science must by necessity bring with it new words, new phrases, new terminologies and new modes and patterns of thinking.

When this new pattern of science is applied to the geometric field, it is called Mutation Geometry; the geometry of intangible change. Mutation means change and here intangible change.

In order to have a basis of distinction in our terminologies, the geometric world is divided into two catagories. Into the first is placed conventional geometry: every type of geometry developed by civilized man until the creation and development of Mutation Geometry. For all practicable purposes, the development was completed several years ago. There is no end to the development of the system. It is a continuing and growing ideal. To what ends we shall reach in its further development God and the Infinite only know. In this category, one finds such geometrics as that compiled by Euclid, college geometry, a mild extension of Euclid, analytic geometry, prospective geometry, in fact, the field of so-called modern geometry.

Its techniques and modes of operation make sense to the human conscience when so explained to it. In this, one has such operations as matrix multiplication, finding the inverse of a matrix, setting up chains of perspectivity, projection and section, to mention a few.

In the second category we place Mutation Geometry. Its techniques, modes of operation and thought patterns at times make little or no sense to the human conscience when attempts are made to explain them because initially they have to be explained in terms of the conventional when they belong in the field of the intangible. To some minds they are esoteric, to others they make no sense at all for the same reason.

In this category one finds such unorthodox operations and notions as shadow transformations, primitive and primal states, transmutes, transmigrates, primordial prototype, prototype solution, communalization, decommunalize, transmigration ordered diagram, and migrating co-partners, etc., to mention a few.

There had to be a clean break with conventional geometry, which has reached a comparative state of stagnation, before one could ever hope to reach for new pinnacles of power and achievement.

We come now to a symbolic statement of our omega proposition:

(1) $$ab:rr = (a \cdot b + b_0 a \cdot r_1)/2$$

where

(2) $$r_1 \wedge br$$

b_0 is the magnitude of b. Symbol (2) is our transmigration diagram for a single omega.

The alpha postulate is a demand.

The alpha and omega products are required to be tempo-locally invariant. Time and space can have nothing to do with their value. We thus operate in a spaceless and timeless universe; the universe of the mind. Diagram (2) is read r_1 is the transmute of b with respect to r. If we have a congregation of omegas:

(3) $$S = ab:rr + cd:rr + ef:rr \ldots\ldots$$

and we perform a dissolution of these with our omega proposition we get:

(4) $$S = (a \cdot b + c \cdot d + e \cdot f + b_0 a \cdot r_1 + d_0 c \cdot r_2 + f_0 e \cdot r_3)/2$$
$$= M + N \cdot r_1$$

where

(5) $$M = (a \cdot b + c \cdot d + e \cdot f)/2$$

(6) $$N = (b_0 A + d_0 C + f_0 E)/2$$

where

$$(7) \qquad \begin{array}{c|ccc|c} \uparrow & r_1 & \wedge & b\,r & \\ & r_2 & \wedge & d\,r & \\ & r_3 & \wedge & f\,r & \downarrow \end{array}$$

Here (7) is our transmigration diagram and the order of the mental associations in it is given by the arrows. It may be read from left to right or up and down. We read for instance r_3 is associated with r_1, the same as b is associated with f.

C and E in (6) are the transmigrates of c and e in (4)

Mental Shifting or Herding

The geometric world is divided into two fields. In the first field are the problems governed and solvable by the solution of an alpha product which we shall presentlt give. In the other are the problems governed by the omega products. These are herded from one field to the other. When they go from one field to the other, they go in pairs, hence our word migrating co-partners. The herding is done in accord with the transmigration diagram (7) which is a consequence of our alpha postulate: the demand of tempo-local invariance. This act is an intangible change. It is not something you may put your finger on. It is a shadow transformation that takes place entirely in the universe of the mind. In most cases the herding is from the omega field to the alpha field out of which we shall solve one of the prototypes.

Prototype Solution

Equation (4) may be written:

$$(9) \qquad N \cdot r^2 = S - M = H$$

If r_1 is orthonormalized, which we may always initially do, our solution for (9) is:

$$(10) \qquad r_1 = (HN \pm \breve{N} \sqrt{N^2 - H^2})\, N^{-2}$$

That (10) is a solution of (9) may be seen by substituting (10) into (9) and getting an identity. In the theory it is shown that it is the only solution and so can be used with assurance.

$\breve{N}$ is the left normal of N.

In any given problem the H and the N are known.

We now solve three representative problems. We shall solve two of them both ways: conventionally and mutation wise. The third we shall solve mutation wise alone because it would take too long to solve it conventionally here. To solve it conventionally would require the rotation of the coordinate axes.

Problem 1

Find the equation of a circle thru the three points:

(11)

(3, 1)
(0, 2)
(1, 1)

Conventional Analytics

$$x^2 + y^2 + ax + by + c = 0$$
$$9 + 1 + 3a + b + c = 0$$
$$0 + 4 + 0a + 2b + c = 0$$
$$1 + 1 + a + b + c = 0$$

$$3a - b = -6$$
$$a - b = 2$$
$$a = 4$$
$$b = 6$$
$$c = 8$$

$$x^2 + y^2 - 4x - 6y + 8 = 0$$
$(x - 2)^2 + (y - 3)^2 = 5$ is the required equation

Mutation Styling

$$\frac{8(1 + 3) - 6(0 + 2)}{4} = (2, 3)$$

$$(x - 2)^2 + (y - 3)^2 = 5$$

The conventional solution of the conventional type needs no explanation to anyone familiar with analytics.

The following detailed description of the Mutation solution pattern is derived from diagram (11): The 8 is gotten from (11) by $3^2 + 1^2 - (1^2 + 1^2) = 10 - 2 = 8$. It is the first row squared in (11) minus the third row squared. The 6 is: $(3^2 + 1^2) - (0^2 + 2^2) = 10 - 4 = 6$. The 1 in the first parenthesis is gotten from (11) by subtracting the 1 in the first row from the 2 in the second row. The three in the first parenthesis is gotten by subtracting the 0 in the second row from the 3 in the first row. The 0 in the second parenthesis is gotten from (11) by subtracting 1 in the first row from the right hand 1 in the third row. The two in the second parenthesis is gotten from (11) by subtracting the left 1 in the third row from the 3 in the first row. The 4 in the denominator is gotten from the two parenthesis (1 + 3), and (0 + 2) by taking twice the product:

$$2\big((1)\ (2) - (3)\ (0)\big) = 4$$

The 2 in (2, 3) is gotten by

$$\big(8(1) - 6(0)\big)/4 = 2$$

The 3 in (2, 3) is gotten by

$$\Big(8(3) - 6(2)\Big) / 4 = 3$$

We now write

$$(x - 2)^2 + (y - 3)^2 = ?$$

If one puts any of the rows in (11) in the last equation one gets 5 and so our equation is as first written by sight from (11):

$$(x - 2)^2 + (y - 3)^2 = 5$$

One only has to look at the diagram (11) to write the answer at sight. There is no necessity for writing down and solving a system of equations. It takes about 1/20 the time to solve mutationwise as conventionally.

Problem 2

Find the equation of a plane thru three points:

(12)
$$\uparrow \begin{array}{|ccc|} 1 & 2 & 3 \\ -1 & 1 & 2 \\ 2 & -1 & -1 \end{array} \downarrow$$

Conventionally

$$x + ay + bz = C$$

$$\begin{aligned} 1 + 2a + 3b &= C \\ -1 + a + 2b &= C \\ 2 - a - b &= C \end{aligned}$$

$$\begin{aligned} 2 + a + b &= 0 \\ -1 + 3a + 4b &= 0 \end{aligned}$$

$$\begin{aligned} a &= -9 \\ b &= 7 \\ c &= 4 \end{aligned}$$

$x - 9y + 7z = 4$ is the required equation.

Mutationwise

$$\begin{array}{ccc} 2 & 1 & 1 \\ -1 & 3 & 4 \end{array}$$

$$1x - 9y + 7z = 4$$

The conventional needs no explanation. A detailed explanation of the Mutation solution is the following:

The second and third rows are respectively subtracted from the first row in (12) giving the two rows under the word Mutationwise. Columns are then suppressed from left to right and the resulting determinants giving the coefficients 1, -9, and 7 in turn then one puts anyone of the rows in (12) in the expression:

$$x - 9y + 7z$$

and gets 4 so our equation is

$$x - 9y + 7z = 4$$

This is done mentally from (12). There is no use to comment here; the ease is obvious and visible.

The third and last illustrative problem is:

Find the properties of the representative conic <u>mentally</u> given its general equation. Let the general equation of a conic be:

$$Ax^2 + Bxy + Cy^2 = Dx + Ey + F \tag{17}$$

A transmutation diagram is set up for the conic equation from which we calculate a primal state number p given by:

$$p = 2/\left(\sqrt{B^2 + (A-C)^2} + A + C\right) \tag{18}$$

I should like to point out here that whenever or wherever the history of man's doings with the conics is recorded or as long as this civilization shall last, one must have to do with these primal state numbers p of the conics for they are a fundamental one.

One now multiplies (17) by the p in (18) giving us our shadow equation:

$$ax^2 + bxy + cy^2 = dx + ey + f \tag{19}$$

from which we pick up the properties from its coefficients. For example, the eccentricity is given by:

$$e^2 = 2 - (a + c) \tag{20}$$

A numerical example

$$2x^2 - 4xy + 5y^2 = 12x + 6y - 42 \tag{21}$$

$$p = 1/6 \tag{22}$$

Multiplying (21) by p or 1/6, we get:

$$1/3x^2 - 2/3xy + 5/6y^2 = 2x + y - 7 \tag{23}$$

from whence

$$e^2 = 2 - (1/3 + 5/6) = 5/6 \qquad (24)$$

In the same way all its other properties such as major and minor axes the coordinates of its foci, the length of its semilatus rectum can be read off at site including its primitive state equation which is:

$$x^2 + 6y^2 = 3$$

can be read off at sight from (23) its shadow equation.

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