

A NEW ANTHESIS

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Louis Pasteur pursued and assessed his studies in the light of his belief that:

"...there is a cosmic dissymmetric influence which presides constantly and naturally over the molecular organization of principles [sic] immediately essential to life; and that, in consequence of this, the species of the three kingdoms, by their structure, by their form, by the disposition of their tissues, have a definite relation to the movements of the universe." [1]

Fathoming the occurrence of a specific angle of dynamic orientation throughout a range of phenomena involving gravitation and electromagnetism: stellar and atomic systems and living molecules, may fulfill such belief that there is unitary, fundamental interdependency (relativity) of each such system one upon the others, mutually generated of cosmic necessity.

In 1783, Herschel found in the constellation Hercules the point among Earth's neighborhood of "fixed" stars toward which the Solar System moves, the Solar Apex. The pole of the ecliptic, known from ancient times, is in the constellation Draco. Though the individual members of the Solar System are variously oriented, the system as a whole spirals toward Hercules along a trajectory inclined about 37° from the pole of the ecliptic [2].

Galactocentrically, that is of great interest. The plane of the ecliptic intersects the plane of the Milky Way, our Galaxy, at points in Sagittarius and Gemini. Beyond Sagittarius lie the mass center and dynamic foci of the Galaxy. Thus, the Solar System plane is about perpendicular to the galactic center, while the axis of the Solar System is inclined to the plane of the Galaxy. As the Solar System spirals along its galactic orbit, toward Cepheus, it would seem that we would rise out of the Galaxy, but, the fact is that the Galaxy itself moves overall at an inclination to its plane, at an angle that may be determinable with respect to our neighbors in the local cluster of

galaxies. It may also be determinable how galactic clusters in general are oriented: their members among themselves; one cluster to others [3].

The axis of the overall motion of the Solar System is of additional interest with respect to the "abandoned" theory of the Æther. Adolph Grünbaum [4] argues that acceptance or rejection of the Æther depends substantially upon one's philosophical and historical comprehension of the issue, as well as upon scientific criteria. Arthur Moestler [5] reviews the history of the rejection of the Æther and concludes that contemporary scientists have glossed the issue. On theoretical grounds, P. A. M. Dirac [6] has reconsidered and found a reconceived Æther necessary.

Somewhat like Laplace not needing the "hypothesis" of God, one may say, Einstein [7] early argued that Relativity Theory eliminated the need for Æther postulates, experiments, and interpretations. Firm in his belief that God does not cast dice, however, by 1952, Einstein wrote:

"... the foundation of electromagnetic theory taught that a particular inertial system must be given preference, namely, that of the luminiferous aether at rest. . .

"Since the special theory of relativity revealed the physical equivalence of all inertial systems, it proved the untenability of the hypothesis of an aether at rest. . .

"It appears therefore more natural to think of physical reality as a four-dimensional existence, instead of, as hitherto, the evolution of a three-dimensional existence.

"This rigid four-dimensional space of the special theory of relativity is to some extent a four-dimensional analogue of H. A. Lorentz's rigid three-dimensional aether." [8]

Inquiry as to the results of the Michaelson-Morely experimental program would, then, seem as legitimate as it is interesting. As summarized by Robert W. Wood:

"The most exhaustive series of observations extending over a period of thirty years have been made by D. C. Miller. . ." He "com-

puted the velocity and direction of the earth's absolute motion in space, on the assumption that the observed effects were real. Astronomical observations indicate that the solar system is moving with a velocity of 19 kms/sec with respect to the brighter stars toward the constellation of Hercules. Miller's results showed an absolute motion in the opposite direction of 208 kms/sec.... A very full and convincing account of these laborious observations and calculations will be found in Review of Modern Physics, Vol. 5, No. 3, July, 1933." [9]

Herbert Dingle, a member of the British solar eclipse expeditions of 1927, 1932, and 1940, to test Einstein's prediction of the bending of light rays passing through the gravitational field of the Sun, has long questioned the Special Theory of Relativity and all its consequents, arguing that there is a serious error at the root of Einstein's mathematical reasoning. The history of science is largely a human story of accurate results obtained in terms of inadequate theory. Dingle insists that, some time, however inconvenient it may be, the inadequacies of Special Relativity must be faced [10].

The Æther is still considerable. But a concept is best judged by its fruits. Beginning in 1925, in terms of his revamping of the Æther, Carl F. Krafft [11] discovered what is fully described by the title of his first, privately published monograph of 1927, Spiral Molecular Structures the Basis of Life, which is replete with diagrams. In that and subsequent writings, which Mendelianly remain unrecognized, Krafft fully developed a theory of helical molecular structure for proteins, with full understanding of the genetic import of his discovery, and much more.

The years 1925—1927 were those when Schroedinger, Meisenberg, Born, Jordan, Wigner, Pauli, Fermi, Dirac, de Broglie, Base, Einstein, et al, were developing the fundamentals of quantum mechanics.

In 1948, Linus Pauling [12] discovered the base of contemporary knowledge of helical molecular structure of proteins, in terms of which F. H. C. Crick and J. D. Watson discovered the helical molecular structure of Deoxyribose Nucleic Acid (DNA). Presenting their theory and structure, Crick and Watson wrote:

"We have assumed an angle of 36° between adjacent residues in the same chain. . . . The structure is an open one, and its water content is rather high. At lower water contents we would expect the bases to tilt so that the structure could become more compact." [13]

That assumed 36° molecule of the DNA double helix, articulated with respect to the molecular axis, to which the purine and pyrimidine bases of the genetic code are perpendicular and planar.

In 1927, Krafft theorized that the spiral structure of proteins provided an explanation of optical activity. This is as yet unsettled. Discussing the "Origin and Role of Optical Isomery in Life," A. S. Garay states:

"Living organisms possess only one of two possible optical isomers. There is no generally accepted theory for the origin of this asymmetry." [14]

It is, however, generally thought that polarized light is necessary to the origin, development, and maintenance of life. Garey asks: "What is the source of circularly polarized light in nature?" A. Dauvillier notes:

"Rectilinear polarized light exists in the solar light diffused by the sky and is produced in nature by reflexion, at an incidence of 37° , from the surface of water or on flat crystalline facets. The light from the sky is not polarized elliptically. Circularly polarized light, which is obtained by causing rectilinear polarized light to fall on a quarter-wave plate — or a Fresnel parallelepiped, may also be produced naturally by polarized light falling on a birefringent quartz or aparcystal." [15]

In the molecule of water, the hydrogens are bonded at an angle of 104.6° across the pole of the oxygen. Regarded in an upsidedown, Alice sort of way, one may say that the hydrogens are oriented to oxygen at $180 - 2 \times 37.7^\circ$ [16].

Investigating "Rotary Brownian Movement. The Shape of Protein Molecules as Determined from Viscosity and Double Refraction of Flow," John T. Edsall wrote:

"All these measurements involve the rotation and partial orientation of protein molecules in an external field of force... the orientation achieved is only partial, since it is opposed by the disorienting action of the Brownian movement of the molecules... involving rotation of the molecules about their axes, arising from thermal agitation. Its effect is to produce a purely random distribution of molecular orientations, in the absence of external orienting forces. In the presence of such orienting forces, a steady state is gradually achieved, a state intermediate between the two limiting conditions of complete orientation and of complete disorder. The exact character of this intermediate state depends on the magnitude of the orienting forces relative to that of the rotary Brownian movement." [17]

In terms of the rationale then presented, the experiment performed on various proteins and other substances involved having a fixed core within a concentric tube rotatable to impart motion to a solution contained in the tube, through which polarized light is passed, its behavior being measured. For at least myosin, the protein of muscle, the angular parameters emerged as 53° and/or 37° .

(Edsall, in another discussion, makes the only reference to the work of Carl F. Krafft which I have yet found [18].)

Gunther S. Stant, both historian and practitioner of molecular biology, discussing the seemingly startling permanence of the genetic code over geologic time, ventures the possible explanation that:

"... there exists some as yet unfathomed geometrical or stereochemical relation between the anticodon nucleotids triplet and the amino acid which it represents. Indeed, if such a relation exists, it would be bound to hold one of the keys to understanding the origin of life." [19]

In "Toward a Definition of Mind," citing the work of D. L. Reiser [20], Harold Kelman wrote this beautiful passage:

"The forming process is metaphorically a spiral, constituted of an intimately connected sequence of levels or a continuum of transformations with movement possible from depth to surface and vice versa. The helix is of crucial import in Indian cosmology. 'Nature moves in a helical pattern in time, so that spiral forms get ingrained at many levels.... This is all part of a galactic rotation in which a Cosmic field plays an important part in transmitting spin (angular momentum) to matter.' This is one facet of Reiser's concept of cosmic imagination which moves in similar directions to my ideas on cosmic minding.

"X-ray crystallography reveals DNA as a double stranded alpha helix [sic].... It directs protein synthesis and heredity. What was intuited thousands of years ago regarding life and living is being confirmed by science or science confronts us with ancient truth." [21]

In terms of the evidence marshaled for the universal occurrence of an angle of about 37°-38°, it seems that now and henceforth, it shall be less metaphorical to make such assertions.

A. N. Whitehead wrote:

"...the search for a reason is always the search for an actual fact which is the vehicle of reason. The antological principle... , constitutes the first step in the description of the universe as a solidarity of many actual entities." [22]

and:

"The task of reason is to fathom the deeper depths of the many-sidedness of things. We must not expect simple answers to far-reaching questions." [23]

A fact is not an answer, but should be of service in approaching an answer, however Zenoid the process of approach may ultimately be.

Musing in Autumn on "The Secret of Life," Loran Eiseley says:

"...I have come to suspect that the mystery may just as well be solved in a carved and intricate seed case out of which the life has flown, as in the seed itself." [24]

Natural Philosophy, as contemporary as it is ancient and honorable, is especially pertinent in this two-cultured era, when I am "credentially" a "litterateur." As such, however, I am particularly a student of the Philosophy of Owen Barfield, whose preface compelled my attention to E. Grant-Watson's exposition [25] of many beautifully amazing aspects of structure and behavior of living creatures. This was my introduction to the botanical principle of Phyllotaxis; the aesthetic principle of the Golden Section; and to the significance of the Fibonacci Series.

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ... ,

or

$1/1, 1/2, 2/3, 3/5, 5/8, 8/13, 13/21, 21/34, 34/55, 55/89, 89/144, \dots$.

These fractions, $1/2 = 0.5$; $2/3 = 0.66$; $3/5 = 0.6$; successively vacillate until $a/b = 0.6180 \dots$.

This Fibonacci Number, $0.6180 \dots$, is the value of the Sine of 38.166° .

"Elected Silence, sing to me
And beat upon my whorlèd ear...
Be shellèd, eyes, with double dark
And find the uncreated light... ."

G. M. Hopkins, S. J. , "The Habit of Perfection."

Having discovered the equiangular, logarithmic spiral, which is the shape of the shell of the Chambered Nautilus; whose equation is satisfied by the Fibonacci Number, Jacob Bernoulli (1654-1705) had this figure inscribed on his tombstone, with the inscription:

"Eadem mutata resurgo (Though changed I shall rise the same)."

[26]

The French poet, Paul Vallery, having caught Einstein's allusion to a "mollusc" of reference [27], essaying on "Man and the Sea Shell," wrote:

"Without the slightest effort life creates a very 'generalized' relativity....

"It does not separate its geometry from its physics but endows each species with all the axioms and more or less 'differential' invariants it needs to maintain a satisfactory harmony between the individual and the world around it....

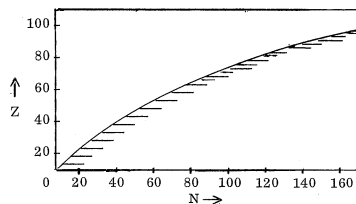
"The pattern of the colored furrows or bands that curve around the shell, and of the bands that intersect them, reminds us of 'geodesic lines' and suggests the existence of some sort of 'field of force' which we are unable to discern, but whose action would give the growth of the shell the irresistible torsion and rhythmic progress we observe in the finished product." [28]

A line segment is a Golden Section if it may be split A B C such that $AB/BC = BC/AC$.

Turning the segment AB perpendicular to BC and completing the rectangle produces the Golden Rectangle.

A Golden Rectangle may be constructed geometrically by taking any line as the base of a square; drawing the square; bisecting the square; drawing a diagonal in one of the created interior rectangles; using that diagonal as a radius; swinging that radius until it intersects a line extended from the original base; from which point, completing a new rectangle containing the original square.

The Golden Section, and forms based thereon, occur throughout artistic endeavors from the Greeks through the Renaissance through Bartok's music [29]. A beautiful and extraordinarily meaningful example of a Golden Rectangle is this graph by Linus Pauling:



"Fig. 8. A curve of proton number Z as a function of neutron number N, calculated as described in the text. The horizontal lines show the ranges of stable isotopes for alternate Z-even elements (for large Z the four most stable isotopes)." [30]

The value of the Tangent of 38.14° is 0.7854, which is the value of $(\pi)/4$, which is generated by the Gregory/Leibniz Series: [31]

$$1 - 1/3 + 1/5 - 1/7 + 1/9 \dots$$

Assessing the mass ratios of electron, positron, proton, neutron, the mesons and hyperons, etc., John J. Grebe found "A Periodic Table for Fundamental Particles," as:

"The existence of unique relations among the fundamental particles based on exponentials of $(\pi)/4$ has been discovered in the search for symmetry, unity, and simple structure." [32]

Grebe has also employed the logarithmic spiral ingeniously in plotting a three-dimensional Chambered Nautilus of a graph ordering all things in terms of frequencies of cycles per nanosecond through cycles per eons [33].

Hermann Weyl, whose discussion [34] of the significance of the Fibonacci Series eases one's mind in daring such sweeping claims as are being presented herein, has stated:

"Perhaps the philosophically most relevant feature of modern science is the emergence of abstract symbolic structures as the hard core of objectivity behind — as Eddington put it — the colorful tale of the subjective storyteller mind... In the progress of science such elementary structures as roughly correspond to obvious facts are often later recognized as founded on structures of a deeper level, and in this reduction the limits of their validity are revealed." [35]

The objection that the Fibonacci Number and its associated Golden Angle at best only approximate to established parameters in astronomy, from which inference about gravitation may be made; in the interaction of electromagnetic radiation with matter, from which inference about electromagnetism and about chemical structure may be made; in microphysics; and in biology; may

be met by stating that appropriate investigation of the deviations from equality may be profoundly significant. The radius of curvature in non-Euclidian Space Time may be involved. The variation of gravitation with time may be involved.

Considering such things in "Gravitation — An Enigma," R. H. Dicke says:

"The chief conclusion... is that it is a serious lack of observational data that keeps one from drawing a clear portrait of gravitation. Each tiny fragment of information appears as a star shining through a murky haze. Conclusions regarding the most fundamental of physical concepts are based on numbers which may be off by a factor of 100."

[36]

Rectification may be achieved by recognition and pursuit of the unification that seems possible in terms of the Golden Angle.

Before finding the details presented here, in an unpublished paper written in January 1968, on the significance of Carl F. Krafft's work and neglect, I perhaps gave myself as litterateur too free a rein when I wrote:

"Krafft unambiguously formulated, and, over several years, amplified and exploited his idea of spiral molecular structure as the basis of life. In terms of his development of Descartes' vortices and his unique 'panpsychism,'... one can visualize Life as an inherent function of energized matter: From electrons spiraling about nuclei, which consist of spiraling mass clouds, yielding atoms which aggregate into stars and planets which spiral about each other and about a focus of a spiral galaxy; which galaxies perhaps ultimately spiral about each other as their overall form of motion in the universe, which may not be expanding if Krafft's ((and my independent)) interpretation of the red shift in the spectra of galaxies prove more accurate than the Doppler effect interpretation of that red shift. As an inherent product of universal spiral motion, under suitable conditions, matter is energized to spiral into molecular structures which live, evolve, and finally are energized to such density of redundant interaction as to resonate

"self-consciousness, yielding Teilhard de Chardin's Noosphere in a way he doubtless would have rejoiced in understanding.

"It may be flamboyant, but I think that the model of DNA 'sculpted' by Crick and Watson, and the models of the alpha-helix by Pauling and Corey; of hemoglobin by Perutz; of myoglobin by Kendrew; and of insulin by Frederick Sanger; should be enshrined along with if not above the works of Praxiteles and Michelangelo, as the greatest testimony to the truest humanistic value of science (man's cosmically emplaced impulse to know) in fathoming the secret of the ultimate, or at least penultimate, formative principle of life... ."

Perceiving the European philosophical tradition as a series of footnotes to Plato, A. N. Whitehead wrote:

"...if we had to render Plato's general point of view with the least changes made necessary by the intervening two thousand years of human experience in social organization, in aesthetic attainments, in science, and in religion, we should have to set about the construction of a philosophy of organism." [37]

Ludwig von Bertalanffy, independent cofounder with Whitehead and others of contemporary Organismic Philosophy, recently concluded an excellent critique of psychology in the modern world:

"... science is more than an accumulation of facts and technological exploitation of knowledge in the service of the Establishment; it may still be able to present a grand view and to become deeply humanistic in its endeavor. If we achieve as much as contributing a bit toward humanization of science, we have done our share in the service of society and civilization." [38]

G. D. Birkhoff, whose gravitational theory needs review of itself if not in the context of this anthesis; who perceptively explored Aesthetics mathematically [39], wrote:

"The prophetic conjecture that Nature is mathematical is one which goes back to Pythagoras and the ancient Greeks. The scientific

"development of the intervening 25 centuries has only served to establish this conjecture to a remarkable degree. The complementary fact that mathematics is natural is, however, just beginning to be grasped. . .

"The essential genetic foundation here is obvious. The mental codification of the facts of Nature in logical and mathematical terms has its origin in the uniformity of Nature and of Mind." [40]

Many thinkers, addressing themselves to problems engendered by the growth of detailed knowledge, advocate radically new departures. This Anthesis, however, is rooted in Tradition embracing Goethe, Leonardo de Vinci, Leonard of Pisa/Fibonacci, Plato, Pythagoras, and so many more. This Anthesis affirms Man and his capacity to know, and, what though, not thinking, at the foot of the cross men cast dice for the seamless raiment, this Anthesis affirms Einstein's belief that God does not cast dice.

REFERENCES

1. Vallery-Radot, Rene, The Life of Pasteur. Translated by Mrs. R. L. Devonshire. Garden City, New York. Not dated, p. 198.
2. Flammarion, Camille, The Flammarion Book of Astronomy. (1880). Translated by Annabel and Bernard Page. 1955-1960 Edition, revised and updated 1964. Simon and Schuster, New York, pp. 52-53.
3. de Vaucouleurs, G., "The Case for a Hierarchical Cosmology," Science, Vol. 167, February 1970, pp. 1203-1213.
4. Grunbaum, A., "The Bearing of Philosophy on the History of Science," Science, Vol. 143, March 1964, pp. 1406-1412.
5. Koestler, Arthur, The Act of Creation, Macmillan, New York, 1964, pp. 243-244.
6. Dirac, P. A. M., "Is There an Æther?" Nature, Vol. 168, November 1951, pp. 906-907.
7. Einstein, A., Relativity, The Special and the General Theory. A Popular Exposition. Translated by Robert W. Lawson, Crown Pubs., New York, 1961, p. 53.
8. Ibid., pp. 148-151.
9. Wood, Robert W., Physical Optics, Macmillan, New York, 3rd Edition, 1934 (13th Printing 1959), pp. 822-823.

10. Dingle, Herbert, "Relativity and Electromagnetism: An Epistemological Appraisal," Philosophy of Science, Vol. 27, July 1960, 223 ff., through "The Case Against Special Relativity," Nature, Vol. 216, October 1967, pp. 119-122.
11. Krafft, Carl F., various works, especially: "Life A Vortex Phenomenon," Biodynamics, Vol. 1, No. 18, December 1936.
12. Pauling, Linus, "The Stochastic Method of the Structure of Proteins," American Scientist, Vol. 43, April 1955, p. 293.
13. Crick, F. H. C., and Watson, J. D., "A Structure for Deoxyribose Nucleic Acid," Nature, Vol. 171, April 1953, pp. 737-738.
14. Garay, A. S., "Origin and Role of Optical Isomery in Life," Nature, Vol. 219, July 1968, p. 338.
15. Dauvillier, A., The Photochemical Origin of Life. Translated by Scripta Technics, Inc., Academic Press, New York and London, 1965, p. 111.
16. Private communication, Linus Pauling.
17. Cohn, Edwin J., and Edsell, John T., Editors: Proteins, Amino Acids, and Peptides as Ions and Dipolar Ions. American Chemical Society Monograph Series, Rheinhold Pubs., New York, 1943; reprinted 1965, pp. 506-507, and p. 536.
18. Ibid., p. 334.
19. Stent, Gunther S., The Coming of the Golden Age: A View of the End of Progress, The Natural History Press, Garden City, New York, 1969, p. 64.
20. Reiser, O. L., The Integration of Human Knowledge, Porter Sargent, Boston, 1958, p. 140.
21. Kelman, Harold, in Theories of the Mind, Jordan M. Scher, Editor. Free Press of Glencoe, New York; Macmillan, London, 1962, p. 264.
22. Whitehead, A. N., Process and Reality: An Essay in Cosmology, Macmillan, New York, 1929 and 1957 (5th Printing 1960), p. 65.
23. Ibid., p. 519.
24. Eiseley, Loren, The Immense Journey, Random House, New York, 1957 (7th Printing), p. 196.
25. Grant-Watson, E., The Mystery of Physical Life, Abelard-Schuman, London, New York, Toronto, 1964.
26. Bell, E. T., Man of Mathematics, Essandess Paperback, Simon and Schuster, New York, 1937 (5th Printing, 1966), p. 135.
27. Einstein, A., op. cit., p. 100.

28. Valery, Paul, Aesthetics. Translated by Ralph Manheim, Bollingen Series, Vol. 13 of his Works. Pantheon Books, New York, 1964, pp. 25-27.
29. Read, Herbert, Education Through Art, Pantheon Books, New York, 3rd Edition, 1956, pp. 14-22.
Lendvai, Erno, "Duality and Synthesis in the Music of Bele Bartok," in Module, Proportion, Symmetry, Rhythm, Gyorgy Kepes, Editor, George Braziller, New York, 1966, pp. 174-193.
Kepes, Gyorgy, The New Landscape in Art and Science, Paul Theobald and Co., Chicago, 1956, p. 329, and p. 294.
30. Pauling, Linus, "The Close-Packed-Spheron Theory and Nuclear Fission," Science, Vol. 150, October 1965, p. 301.
31. Turnbull, Herbert Westren, "The Great Mathematicians," The World of Mathematics, James R. Newman, Editor, Simon and Schuster, New York, 1956, Vol. 1, p. 138.
32. Grebe, John J., "A Periodic Table for Fundamental Particles," Annals, New York Academy of Sciences, Vol. 76, Art. 1, September 1958, p. 14.
33. Grebe, John J., "Time: Its Breadth and Depth in Biological Rhythms," Annals, New York Academy of Sciences, Vol. 98, Art. 4, October 1962, pp. 1206-1210.
34. Weyl, Hermann, "Symmetry," in: Newman as in Note 31, Vol. 1, pp. 671-724.
35. Weyl, Hermann, Philosophy of Mathematics and Natural Science, Athenaeum paperback, New York, 1963, p. 237.
36. Dicke, R. H., "Gravitation - An Enigma," American Scientist, Vol. 47, March 1959, p. 40.
37. Whitehead, A. N., op. cit., p. 63.
38. von Bertalanffy, Ludwig, Robots, Men and Minds, Braziller, New York, 1967, pp. 114-115.
39. Birkhoff, G. D., "Mathematics of Aesthetics," in: Newman as in Note 31, Vol. 4, pp. 2185-2195.
40. Birkhoff, G. C., "The Mathematical Nature of Physical Theories," American Scientist, Vol. 31, October 1943, pp. 281-282.

