

THE CHALLENGE OF PEACE

For the Christian, for Example

by Lyndon H. LaRouche, Jr.

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My subject here, is the possible basis for a peace among faiths, despite the presently accelerating threat, of a plunge of this planet into a prolonged new dark age of all humanity.

For the Christian, for example, the center of his, or her sense of a timeless existence as a personality, is centered, as for Johann Sebastian Bach, in a reliving of the *New Testament* account of the Passion and Crucifixion of Jesus. The persistence of that experience, typifies the unique meaning of *Christianity*.¹

The sense of the efficient meaning of that moment from our past, for our present and future, alike, evokes within the Christian a sense of what that great philosopher, historian, poet, and dramatist Friedrich Schiller, portrays as “The Sublime.” His treatment of the functionally essential features of actual history, as a subject of his dramas, as in the case of Jeanne d’Arc, is extraordinarily inspiring on this specific account. For reasons I shall present during the course of this report, that reference to Schiller, points us toward the true meaning of *spirituality*.

This emphasis upon Schiller is needed to situate the modern notion of *spirituality* inside the same, real universe inhabited by the Creator of our universe, rather than as some different universe, the latter outside that in which we experience mortal life. Until the sense of the *Sublime* is also located as the central, underlying feature of Plato’s method in physical science, we in modern, now globally extended European civilization, would remain unable to bridge the apparent gap between, on the one hand, what Christian Apostolic tradition,

for example, knows as *spirituality*, and, on the other hand, *the universality of the physical domain*.

The stubborn persistence of this gap, between spirituality and physical science, confronts us all, Christians and others, with the fact of the exceptional historical importance of Europe’s Fifteenth-Century “Golden Renaissance.” The rebirth, in Europe, of a competent form of scientific method, by such followers of Cardinal Nicholas of Cusa as Johannes Kepler, after nearly fourteen centuries of hegemony of the corrupting Roman imperial tradition throughout the Mediterranean region, has demonstrated the perseverance of that method of thought, by means of which the gap between spirituality and physical science could be bridged.²

Therefore, it is for such excellent reasons, that the method of Plato’s Socratic dialogues, is sometimes identified as a method of “spiritual exercises.” This connection is implied, if we recognize the significance of the interrupted, but nonetheless persisting continuity of the physical scientific method of Plato, and of his collaborators and followers, during the period concluding with the work of Eratosthenes and Archimedes, through the rebirth of that method as the Platonic hegemony of that Golden Renaissance which has been the wellspring of all modern Classical culture.

Our comprehension of the quality of perseverance of the active principle of that ancient-to-modern connection, is helped, if we take into account the fact, that the method of

1. Cf. Plato, *Phaedo*, and Moses Mendelssohn, *Phaedon* (first edition: 1767).

2. This is not to overlook such notable cases as the direct contribution of the Baghdad Caliphate to Christian civilization, the indirect contribution of India to both, and the cultural debt of civilization generally to past achievements in China. The exceptional quality of the Fifteenth-Century, “Golden Renaissance,” is that it is the watershed from which the existence of the modern sovereign form of nation-state is derived.

the *Gospel of John* and the *Epistles* of Paul, reflects some exceptional continuations of the Platonic heritage's unique contribution to the practice of communication of notions of universal principle, even under the conditions of Roman imperial rule during the First Century A.D. Similarly, St. Augustine also typifies such a perseverance.

This needed connection, between spirituality and physical science, was always implied in the relatively happier moments of what became today's anti-Romantic, Classical tradition of Plato, Gottfried Leibniz, Moses Mendelssohn, et al. Despite those happier moments, the needed, explicit connection between those two, was apparently never pinpointed, until my own original discoveries in the science of physical economy, as first developed over the interval 1948-1953.³

Therefore, with that latter connection in view, I outline here both the case of the needed recognition of such connections, and of their bearing upon the achievement of an urgently required peace among faiths.

1. The Threat to Peace

The present, crucial, and immediate practical importance of exploring the matters just outlined, is shown by considering today's deadly threat of generalized religious and related types of warfare. At the present moment, this threat is best typified by the military-utopian doctrine best known as Brzezinski-Huntington-Bernard Lewis "Clash of Civilizations" strategy. Therefore, now, as for the 1648 Treaty of Westphalia, it is of more than collateral importance, that an ecumenical "peace among faiths" policy be nourished,

3. As I demonstrate at a later point in this report, although Vladimir I. Vernadsky's definition of the *Noösphere* locates an aspect of spirituality within the terms of physical science, the cultural implications were not explicitly addressed efficiently in any known source prior to my own.

first and foremost, among those religions which accept the notion of man and woman as made equally in the likeness of the Creator of the universe. We must proceed from that starting-point, to explore a still-deeper basis for a broader, more universal accord. This basis can be found only in a rigorous conception of the coherence of a provable universal principle of spirituality with the universality of the physical domain.

Therefore, today, the avoidance of the now-threatened new dark age of religious and kindred forms of "ethnic" warfare, must focus our attention, chiefly, on the spiritual connections of European to Asian cultures. For this purpose, a merely negative achievement, a self-deluded utopians' state of non-warfare, does not provide a positive basis in method for achieving an actually durable peace.

True peace rests always on a positive basis, never a merely negative one. Peace is never either the mere absence of war, nor some silly construct such as the "perpetual peace" which Immanuel Kant proposed might be the negation of the negation of war. The source of durable peace, is knowledge of the importance to both oneself and others, and to one's most essential nature, of mutual benefits which could not exist without active measures of cooperation, one with the other.

The success of the search for a positive basis for durable peace, depends upon two general requirements of an axiomatic authority. The first of these, is that *the mode of cooperation which*

peaceful intention requires, must be feasible in the physical universe. Second, the actions which are intended must be coherent with certain universal principles which are specific to human nature per se.

Resistance to the combined authority of those two classes of prerequisites, is the root of the mass-murderous follies so often spawned by the utopian schemes of those pacifists who seek to subdue the world to an enforced peace. Those bloody-handed utopian dreamers have been either recklessly ignorant



"The Trinity," by Massacio. Christ's Passion and Crucifixion express Schiller's principle of the Sublime.

of what I have just written here this far, or, in the alternative, have intentionally disregarded those considerations.

Let the Stones Speak!

The customary failure, as by the utopian pacifists, is the error, of failing to start from that evidence which proves the hypothesis, beyond any reasonable doubt, that man is a creature of a certain, unique, spiritual quality, a quality which is not manifest in any other living species. Such a proof has been supplied, for example, by Vladimir I. Vernadsky's definition of the *Noösphere*, as I have reached a congruent conception within the framework of a science of physical economy.⁴

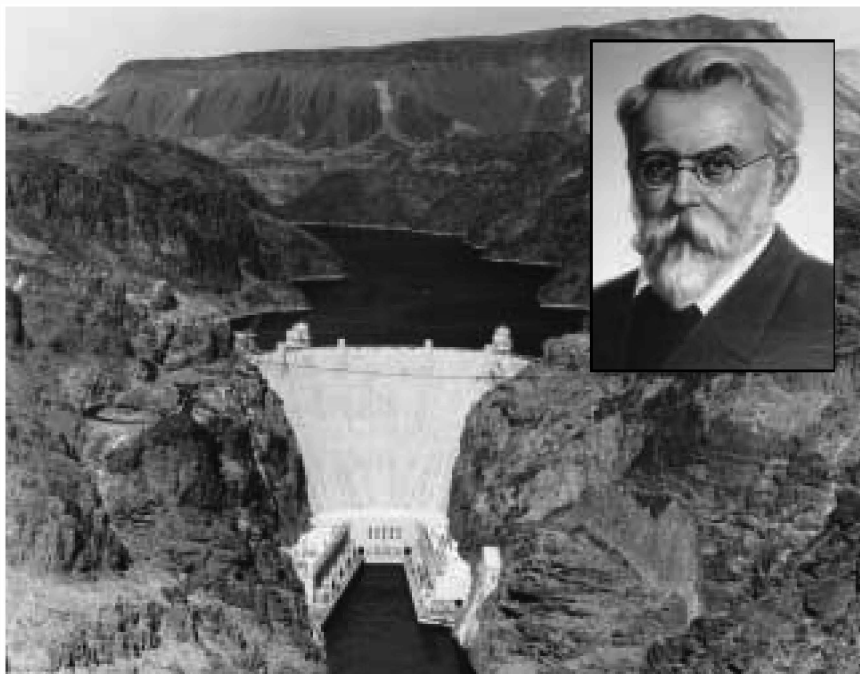
As Vernadsky showed, the universe as a whole is presently known to be divided among three distinct but efficiently interconnected *physical phase-spaces*. These are so distinguished by a mass of elementary, universal physical-experimental evidence.

If we assume, as a matter of universal experimental practice, that the universe were elementarily *abiotic* in its origin, the universe appears to be intrinsically *entropic*, in the sense of Clausius et al. But, then, there exist physical effects, expressed within that universe, which are associated with living processes, or with fossils produced by living processes, the which are intrinsically *anti-entropic* processes. That defines what Vernadsky identifies, from the standpoint of biogeochemistry, as the *Biosphere*. Thirdly, there are changes in the ordering of the Biosphere which are intrinsically *anti-entropic relative to that Biosphere*, and are, uniquely, the products of human cognitive action. Among all living species, only the sovereign, voluntaristic, cognitive powers of the human individual, are capable of generating such changes. The latter domain is defined by Vernadsky as the *Noösphere*.

Thus, to the best of our present knowledge, the universe is composed of those three, distinct, but efficiently interconnected phase-spaces.⁵ The interconnection so ordered among those three phase-spaces, expresses the existence of a single, universal principle of Creation, which accounts for the coming into existence of a form of life like no other, the human cognitive individual. Thus, even the stones have spoken, to

4. Cf. Lyndon H. LaRouche, Jr., *The Economics of the Noösphere* (Washington, D.C.: EIR News Service, 2001).

5. This is to say that the universe is *Riemannian*. Bernhard Riemann, *Über die Hypothesen, welche der Geometrie zu Grunde liegen*, H. Weber, ed. (New York: Dover Publications reprint, 1953).



The Hoover Dam, showpiece of the Franklin D. Roosevelt-era infrastructure projects, dramatically illustrates how human cognitive activity shapes the Biosphere, which in turn changes the ordering of abiotic phase-space. (Inset: Russian biogeochemist V.I. Vernadsky.) "Thus," LaRouche writes, "even the stones have spoken, to declare that man and woman are made equally in the living image of that Creator."

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The most characteristic quality which thus distinguishes the human species from all others, is that mankind is the only form of life which is capable of willfully increasing its *potential relative population-density*, as this physical effect is measurable per capita and per square kilometer of our planet's surface. This increase occurs through active cooperation in applying universal physical principles originally discovered by what Vernadsky identifies as the *noëtic* powers of individual, *voluntaristic* human minds: *cognition* as Plato's Socratic dialogues define the noëtic process of *cognition*.

In so acting on behalf of the principle of cognition, rather than custom, we not only change our species' physical relationship to the universe; we change the universe, in the same sense that living processes transform the Earth from an ostensibly abiotic manifold, that to the effect of increasing the influence of the Biosphere over the processes and condition of the planet as a whole.

Our species' relationship to the universe at large, is thus defined in terms of a social process of *fostering and transmitting experimentally valid discoveries of universal physical principles over the course of successive generations*. These applied discoveries have the effect which the secondary-school pupil might equate to the introduction, successively, of progressive changes in the array of axioms and postulates

of a deductive system. In other words, they correspond, in effect, to an unfolding process of what would be regarded as willful, progressive, *genetic changes* in the species, or variety of a lower form of life.

Thus, the human individual's ability to effect such functionally definable changes in his, or her society's potential relative population-density, is an expression of a distinction of the human species from all others.

Through the transmission of the reenacting of experimentally valid discoveries of universal physical principle, over successive generations, the individual person escapes the bounds of a member of a species acting upon and with nature, to emerge as a creature acting willfully to change the course of his species' willful transformation of *the process of changing nature. Man rises above the beast within creation, to participate in the progressive changing of creation itself.*⁶

This ability, to generate such changes, imparts to our species an inhering, god-like power, hence showing the individual person to be made in likeness to the Creator of the universe. It implies a universal principle: We must ask, what is the quality of the universe, that it generates within it, not merely a species such as man, but creates the preconditions required for the coming-into-being of our species? This question poses the physical argument for existence of what the Apostle Peter's friend, Philo Judaeus of Alexandria, defended as the continuing efficiency of a Creator of the universe, and of the species of human individual, made in His image, within that universe so composed.

Thus, let the stones speak the truth of this matter, were no other voice to be heard. Such is the principle of *natural law*.

This brings us to the question: Are today's usual approaches to human knowledge, based upon asking the wrong question?

2. Substance and Hypothesis

Contrast my argument so far to what is known as a "Cartesian" view of the universe.

In a "Cartesian" or similar system, objects are regarded as either idle, or wandering in a Euclidean-like space-time of backwards-forwards, up-down, and side-to-side motion. So, a consistent, but flawed mathematics, such as that of Joseph Lagrange, might be derived from a few such utopian (*a priori*) definitions, axioms, and postulates. Experience is then explained, foolishly, within that fantastic framework. Such a systemically flawed, foolish mathematical system, was asserted by the Joseph-Louis Lagrange whose assumptions were exposed as false by Carl Gauss's revolutionary 1799 publication of his fundamental theorem of algebra.⁷

6. *Man hypothesizes the higher hypothesis.*

7. Carl Friedrich Gauss, *Werke*, III (Hildesheim, New York: Georg Olms Verlag, 1981), pp. 1-103.

Similarly, still today, the prevalent, pathological tendency in virtually all societies, is to assume that recurring patterns of experience are to be interpreted, more or less mathematically, as if at the classroom blackboard, as belonging to some system which is governed by a more or less permanently fixed set of definitions, axioms, and postulates.

So, most people, in most cultures to date, governments and popular opinion alike, tend to be controlled by the utopian form of pathological conviction, akin to blind faith in a fictitious Claudius-Ptolemy-universe, that certain current trends are virtually axiomatic, and thus irreversible, or otherwise inevitable. The result of that misguided, usually wishful, blind faith in the fixed character of perceived current trends, causes many people to cling to those beliefs, even when all clear evidence points to an ostensibly axiomatic (*systemic*) change in progress.

The recent blind faith in a recovery of the U.S. economy, on the basis of such superficial evidence as momentary rises in dubious forms of indexes and the like, is typical of mass hysterias premised on blind faith in acquired current habits of behavior. Such commonplace, pathological beliefs, as by most governments and popular opinion today, assume the character of mass delusions. These are expressed as such delusions are widespread among leaders of the U.S. Congress and within the Presidency today, as more or less schizophrenic states of denial of any reality which is implicitly contrary to a prevalent such mass-delusion.

Such crises are already inherent in the nature of any so-called "traditional" form of society. However, there is always an avenue of escape from such delusions. Societies, so confronted, may overcome such delusions, and survive, by means of apparently radical, sweeping changes in ruling sets of axiomatic assumptions. So, in 1932-1933, Franklin Roosevelt's leadership rescued the United States from the doom to which the legacy of Calvin Coolidge and Andrew Mellon had relegated it.

Scientific and technological progress, is typical of those radical changes in ruling assumptions, by means of which societies not merely survive, but progress, in an upward-evolutionary way, toward better conditions than had been possible earlier. These beneficial, revolutionary changes, are often chosen only when the belated recognition of some terrible threat to society induces it to accept, even if reluctantly, the need to adopt such radical upshifts in technological, or social institutions, or both combined.

Thus, we have the kinds of opposition to scientific progress which have frequently arisen in the form of so-called "traditional cultures," as among the notable causes of tragedy which entire nations and cultures have brought upon themselves. This, and related matters, were addressed within Plato's dialogues. He identified two general types of causes for the great catastrophes, up to that time.

The first type was represented by so-called "natural catastrophes," expressing forces beyond the ability of existing so-

ciety to control. The second type were man-made catastrophes, such as the folly of the Peloponnesian war: a people's own acts of commission, negligence, or both combined. For the moment, consider the second type; we shall reexamine the first type of case at a later point in this report.

Catastrophes of the second type all fall into the category of *Classical tragedy*. All such tragedies describe a terrible consequence of the failure of a people to change its established culture in a timely fashion. On the Classical stage, this failure is often expressed by a leading figure, such as Shakespeare's Hamlet or Schiller's Wallenstein, who fails to bring about urgently required, appropriate changes in established institutions and habits of popular response. However, in all Classical tragedy, on the stage, or in real life, it is always the people themselves whose clinging to habituated opinions, brings the disaster which falls upon them.

Hence, the importance of the principle of the *Sublime*, as in Jesus Christ's *Sublime* sacrifice, for the sake of the need to free mankind from that habituated, tragic folly, which, uncorrected, would doom it. Hence, the Sublime quality of that devotion, by Jeanne d'Arc, which led the way to the establishment of the first modern nation-state, Louis XI's France. Hence, the Sublime quality of devotion, by Sir Thomas More, which enabled the English Renaissance to survive the folly of Henry VIII.

The needed, systemic examination of the flaw expressed by Classical tragedy, is Plato's Socratic dialogues. There, the principle of the Sublime is elaborated as reflecting *the principle of hypothesis*. The significance of that latter term, the principle of hypothesis, is best illustrated from the standpoint of the most elementary features of a competent mathematical physics, that of Kepler, Leibniz, Gauss, and Riemann, for example. I develop the relevant argument to that effect, as follows.

The Principle of Hypothesis

The Classical pedagogy which Plato employed, in his *Republic*, was to emphasize, that what the individual perceives with aid of his, or her senses, is comparable to shadows cast upon the irregular surface of the walls of a dimly firelit cave. Reality is the unseen object which casts those shadows.

Even most among those who have working, if imperfect knowledge of scientific method, their interpretation of the relationship between shadow and substance is fairly described as "inside-out," or "upside-down." What is true in their opinion, is that, although we can not see what are experimentally proven as universal physical principles, those principles, such as the principle of gravitation uniquely discovered by Johannes Kepler, do act efficiently upon the world of our sense-perception, and are, thus, subject to experimental verification. To present date, most scientists are, unfortunately, what is called "reductionists," who have erred, in seeing this role of principle as more or less magical, as mysterious forces acting from under the floorboards of a "real universe" which

is misidentified as in one-for-one correspondence with the world of shadows called sense-perception.

That is to say, that, usually, the reductionist and the scientist see the same shadows. The difference is, that the better scientist, such as Plato, Cusa, Kepler, Leibniz, Gauss, and Riemann, sees the shadows as shadows, and thinks of the real, universal principles which cast those shadows; the reductionist is a superstitious fellow, who mistakes shadows for real objects, like the hunter who shoots at shadows, and, therefore, often sends his children to bed hungry.

We are enabled to know that Plato's argument is true, through those paradoxes of experience which could not be solved within the bounds of sense-certainty. These are termed *ontological paradoxes*.

Typical of such paradoxes, are, from Plato's lifetime, the problems of doubling the square and the cube.

In modern times, we have the most exemplary case of Kepler's unique method of discovery of universal gravitation. We have, similarly, the Leibniz-Bernouilli discovery of the way in which the catenary reflects a universal physical principle of least action. So, Gauss's 1799 refutation of D'Alembert, Euler, and Lagrange, refutes, to the present day, the fundamental error underlying the "ivory tower" follies common to all empiricist and positivist misconception of the elementary principles of a mathematical physics.⁸

Gauss's exposure of that empiricist folly, on the matter of quadratic, cubic, and biquadratic functions, is to be recognized as a modern treatment of the same conception, respecting the doubling of the square and cube, solved in large degree by the method of Plato, through successive work of Plato and his followers, through the summation of this by Archimedes' contemporary Eratosthenes. Consider, similarly, Plato's emphasis on those matters of universal physical principle which Plato adduced from examination of the proof of the construction of the Platonic solids.

All of these cases, especially the matter of cubic and biquadratic functions, and the Platonic solids, are typical of the way in which the seemingly impossible paradoxes of sense-certainty expose the world of imagined sense-certainty, as a universe of mere shadows.

There is nothing mystical in this distinction. Our senses are organs of our body. They do not show us the world outside our skins directly, but only the reactions of our senses to that world. What we see, is what our mind interprets those sense-perceptions to be. Knowledge is not derived from sense-perceptions as such; knowledge is acquired through the way in which we are able to bring about willful changes in the behavior of that world which the mere shadows of sense-perception reflect.

The distinctive feature of the human mind, is its unique ability to deal with ontological paradoxes of the type which arise in that way. This unique capacity is what Vernadsky

8. *ibid.*



Construction of the Platonic solids at the Schiller Institute in Chicago. The cubic and biquadratic functions, and the Platonic solids, LaRouche writes, “are typical of the way in which the seemingly impossible paradoxes of sense-certainty expose the world of imagined sense-certainty, as a universe of mere shadows.”

preferred to term *noësis*, thus avoiding that commonplace, often misleading habit of references to the act of *knowing* (*cognition*): the habit of saying “knowing” when the speaker intends to signify merely learning, merely *understanding* in Immanuel Kant’s sense.⁹

What Vernadsky signifies by *noësis*, is most strictly defined as the act of *hypothesizing*. The prototype of a valid *hypothesis*, is an experimentally valid discovery of a universal physical principle. On this account, Kepler’s unique discovery of a principle of universal gravitation, is, for reasons we shall encounter here, the leading example of the establishment of a true modern mathematical physics.¹⁰ By “mathematical physics,” I mean, as Gauss and Riemann make this point explicitly, a mathematics which is derived from successful physical hypotheses, rather than a supposed physics derived at the mathematician’s, generally accepted, reductionist’s classroom blackboard.¹¹

By universal physical principle, we should understand a class of physical effects which can not be produced in any

9. Kant’s *Critiques* were each and all written as attempts to eradicate the influences of Plato, Leibniz, Lessing, and Moses Mendelssohn, for once and all. The basis which Kant adopted for this was, chiefly, the argument made by Leonhard Euler’s fraudulent attack on his spiritual grandfather, Leibniz, in Euler’s 1761 *Letters to a German Princess*. The kernel of what Kant attempted was not only to outlaw the concept of hypothesis, but, as Kant’s existentialist followers insisted, to eliminate truth, in favor of arbitrary mere opinion.

10. Johannes Kepler, *The New Astronomy* (1609), William H. Donahue, trans. (Cambridge, U.K.: Cambridge University Press, 1992).

11. This leads, most notably from Gauss, to Riemann’s referenced, revolutionary, 1854 habilitation dissertation.

other way, but as the expression of that specific intention which, when proven to be truly universal, becomes thus a experimentally proven universal principle. Vernadsky’s definition of the *Biosphere*, is an example of this point. Physical effects which are attributable only to *an anti-entropic principle of life*, is an example of this. Physical effects which are attributable solely to the willful impact of *anti-entropic cognition* (*noësis*), Vernadsky’s *Noösphere*, is also an example of this.

Therefore, it would be foolish to imagine that human intelligence can be adduced from a principle also specific to lower species, such as apes. The increase of the human species’ potential relative population-density, from the level of the several millions conceivable for a species of ape, to billions today, is a distinct physical effect which is not only unique to mankind, but is traced solely to the specific cognitive function which is lacking in the apes. Proceeding from the apes, toward man, we can go no further than to recognize, that the human biological organization is, in some way, an extraordinarily appropriate setting for the existence of an efficient cognitive (*noëtic*) function. In some way, the existence of a seemingly ape-like creature, man, was the biological precondition for the appearance of this quality in a living species. However, this leads us to a still deeper consideration: the meaning of substance.

The Composer

The notion of a universal physical principle reaches backward, as much as forward. Thus, since the existence of a universal cognitive phase-space is shown by the indicated evidence, the principle of human existence was not born with human existence, but was always present and active. Restated: there was always a biotic potential (i.e., phase-space) acting upon the abiotic domain; similarly, there was always a phase-space corresponding to the cognitive principle, operating upon, and interacting with the same domain as the combined abiotic and Biosphere.

The point to be made is underlined by stating that “universal” signifies that nothing exists “before,” “after,” or “outside” that which is universal. The existence of the universe is perfectly self-contained. Einstein’s celebrated quip, that the universe is finite but unbounded, is appropriate. Therefore, the notion of time itself must be regarded as of a relative, not a tick-tock nature. We must assume that time itself evolves as the universe undergoes a Riemannian-like process of development. In other words, the Gauss-Riemann “curvature” of physical space-time evolves to the effect that characteristic measurements become relative, rather than *a priori* “Cartesian” absolutes.

In that Riemannian universe, principles are “eternal,” that in the Riemannian sense of relative permanence. Once the implications of that are taken into account, suddenly, our attention is thrust back to Heraclitus’ and Plato’s insistence, that nothing is permanent, but the kinds of change associated

with the efficient action of universal principles. Our attention is returned to Plato's *Timaeus* dialogue, and the subject of the Creator of the universe as *The Composer*, composer in the sense of Kepler's argument, and of J.S. Bach's *bel canto*-derived concept of well-tempered polyphony.

Therefore, I shall now add certain remarks which bear upon the axiomatic quality of the make-up of our physical universe. However, since my subject here, is the way in which the human individual finds his morally functional place in the universe, rather than the subject of astrophysics per se, I limit my remarks here, to showing how we must imagine our social relationship to that universe, rather than matters of putatively abiotic astrophysics as such.

The lack of any possibility of existence "before," "after," or otherwise "outside of" the bounds of universal physical principle, eliminates the existence of "absolute time" in the "Cartesian" sense of that term. Everything which unbridled fancy might suggest as existing, such as an "invisible hand," independently of such limits, is simply a delusion.

That point brings our attention to that notion of a specific quality of "relativity" of time, which I introduced above. This focuses attention upon the problematic features of our knowledge of things. I emphasize our access to actual knowledge of the certainty of the non-existence of those shadows merely imagined to exist as self-evidently efficient objects, to exist "outside" the bounds of cognitively knowable universal physical principles.

The evidence is that our universe is Riemannian, a self-expanding universe. I mean Riemannian in the special sense of an unfolding of the known existence of that universe, as discovered in ways befitting the notion of known relations among three general types of phase-spaces (abiotic, living, cognitive). This unfolding is not presently defined in terms of particular events, but, rather, those changes in the physical geometry of the universe which correspond to the emergence of a significant role played by newly expressed "dimensions."

Under those conditions of the permanence of change, the curvature of the universe is altered in effect. With such changes, the practical meaning of time is altered. The idea of a "clock time" independent of those changes, must be rejected. A notion of relative values of physical space-time, and of physical-space-time curvature, must replace ignorant persons' fantastic notions of *a priori* clock-time. In effect, time may be shortened, perhaps defining the universe as relatively much, much younger today than most astronomers estimate.¹²

12. Never be duped into accepting what is presented as statistical evidence, simply because a mathematical case has been made for such a proffer. The assumption that there exist universally constant values for clock time of certain types of events, is an assumption which has never been proven. What if the universe has been speeding up, that in relative orders of magnitude, as a result of its Riemannian mode of self-development? In other words, the "density" of action within the universe has been increasing? What then is the clock you are using to edify the credulous in the matter of the age of the

As I shall show, a few moments ahead, it is the way in which social relations are defined by cognition, which defines the manner of expression of relative physical-space-time within the universe as a whole.

The notion of a Creator of the universe, is of an active principle of continuing creation, always, everywhere. Contrary to silly Isaac Newton, the universe is not a clock, which must be periodically rewound. At no time did an abiotic principle exist, without the active, superior presence of the universal principle of life, nor without the active presence of that still higher principle of cognition, which is expressed as a sovereign quality of the individual human mind. Thus, man is made in the likeness of the Creator, a fact which affords the creative sovereign mind of the human individual the power to know the personal existence of the Creator with the same degree of certainty as Kepler's unique act of discovery of universal gravitation.

So, the stones themselves have spoken.

The Mars Colony Example

To illustrate the practical significance of what I have just written, above, consider the implications of planting a functional "science city"—a Mars "Los Alamos"—life-support system under the surface of Mars, and also manned exploration in other parts of the Solar System. Look at the implications of this from the standpoint of the *Timaeus* dialogue. Return to the discussion of the principle of Classical tragedy.

As I stated above, Plato distinguished between what are usually classed, respectively, as natural and man-made catastrophes. Yet, if we consider negligence as also a source of a catastrophe, the failure of mankind to develop its powers over nature, such as the failure to continue the U.S. Corps of Engineers' program for the northerly regions of the Mississippi river-system, may be the relevant, man-made cause of what might have been misclassified as a natural catastrophe. The failure to continue the Hill-Burton policy for U.S. national health-care, leaves the nation vulnerable, by willful negligence, to relevant future catastrophes. Might it not be likely, that scientific progress could enable us to exert relevant degrees of control over effects of certain seismic processes? What of the Solar-System processes which now determine the Earth's ice-age cycles? Are the cosmic forces within our Solar System beyond the reach of our species' cognitive powers?

Controlled thermonuclear fusion is within our reach. That change will increase our power in the universe by relative orders of magnitude beyond present levels of practice. The potentiality of becoming able to control qualitatively denser

universe? Taught science has always been riddled with "solid facts" resting mathematically upon hidden axiomatic assumptions of an arbitrary character. The entire mathematics of Euler and Lagrange, for example, rests upon unstated, axiomatic assumptions respecting the self-evidently "Euclidean" nature of universal physical-space-time. These were the assumptions which Gauss and Riemann showed to have been absurdities.



An artist's rendition of a space station approaching Mars, in a future colonization effort. "Manned exploration to more distant locations, begs the discovery of processes of still greater characteristic 'energy-flux density.' Ostensibly, the general rule is, that the ever-deeper cognitive penetration of the microphysical domain, is the pathway toward the power to master the astrophysical."

"matter-antimatter" reactions, teases the imagination. How shall we seek and find the power to control, more and more, "the forces of cosmic catastrophe"?

Mars is the principal immediate challenge in that direction.

Consider the proposal which I developed, during 1985-1986, in memory of space-pioneer Krafft Ehrlicke's proposal for colonization of the Moon. He had been among those who were committed to reaching the stars on our horizon. I had come to share that outlook. He had emphasized the irony, that if we did not have the Moon as a stepping-stone to Solar space beyond, there were no visible pathway for mankind's travel to the planets and stars beyond. The physical effort of going beyond Earth-orbit, required the "industrialization" of the Moon, to overcome the otherwise seemingly impossible burden of producing the greater part of the components of the bill of materials needed for manned travel to and from our first interplanetary target, Mars. Use, and processing of the raw materials, including helium-3 isotope, available on the Moon, would enable us to assemble flotillas of spacecraft at locations such as Earth's geostationary orbit, for continuously powered flight to the orbit of Mars. From a place above Mars, we could then accumulate and deploy the systems needed for implanting a life-support system under that planet's surface.

To reach Mars by means of continuously powered acceleration-deceleration, and beyond, would require mastery of controlled thermonuclear fusion as a primary source of power. Manned exploration to more distant locations, begs the discovery of processes of still greater characteristic "energy-flux density." Ostensibly, the general rule is, that the ever-deeper cognitive penetration of the microphysical domain, is the

pathway toward the power to master the astrophysical.

Against such a general background as that, the crucial issue for our focussed attention here, is the challenge of defining those "microphysical" changes in the general characteristics of "pre-human" living processes, which correspond, in terms of microphysics, to the demonstrable difference between human cognitive processes and the qualitatively inferior organization of the mental-perceptual powers of sub-human living creatures. On that account, we already know, as Plato's dialogues typify this, the physical effect expressed as the successful act of cognition (*noësis*). We have yet to define the microphysical expression of those processes which *noësis* represents as a presently known physical effect, microphysical processes which lie, necessarily, beyond the scope of today's reductionists' notion of a genetic heritage.

As in the exploration of astronomically cosmic processes, so, in the search of the remotest regions of microphysics, the rule must be an ordering of discovery of universal physical principles which corresponds to man's increasing power to control natural and man-made catastrophes, a power obtained solely through newly discovered universal principles.

In summary of the point illustrated by the Mars-colonization case, we have the following.

What we presently know, with certainty, is the nature of the successful act of cognition. We know this in two aspects. We know this, firstly, in terms of the modern Platonic mathematical physics developed by such followers of Nicholas of Cusa and Leonardo da Vinci as Kepler, Leibniz, Gauss, and Riemann.

We also know this in such matters as the distinction of Classical artistic composition from such degenerate forms of

art as those developed by empiricists and existentialists, such as the decadent parodies of artistic composition and performance known as self-styled “Romantic” and “modern” practices. I shall return to the matter of Classical art, as a form of universal physical principle, below. First, we must prepare the way for that, by continuing to define the meaning of hypothesis and substance as to be viewed within the axiomatic framework of a Gauss-Riemann mathematical physics.

3. The Higher Hypothesis

The usual error in generally taught in today’s physical-science classrooms, and elsewhere, is, that even to the degree that the fact of discovery of experimentally provable universal physical principles, is recognized, such discoveries are usually treated as essentially actions of individuals, without considering the manner in which such discovered principles are actually transmitted through the larger social processes, from past, through present, into the future of society. That problem has persisted despite modern access to knowledge of Plato’s argument respecting the soul.¹³

This transmission of knowledge of universal principles, which sets society absolutely apart from and above a species of apes, does not occur through textbook or kindred forms of mere learning. It does not occur through transformation of “information” by the Internet. *Transmission occurs solely through replication of the original (noëtic) act of discovery.*

A typical reflection of such replication, is the so-called Classical humanist method of education, as successively defined by Friedrich Schiller and Wilhelm von Humboldt. By replicating the experience of the act of discovery, as it had occurred in preceding generations, the young undergo a growth of true knowledge, and also benefit from a development of their moral character. The student must not learn from the textbook, but come to know discoveries, by replicating the act of the original discovery within the sovereign cognitive processes of his, or her own mind. The student must replicate the actual experience of the act of discovery of experimentally valid universal principles, as made by original discoverers. As Vernadsky recognized, the replication of the cognitive act of discovery is *an action to a physical effect of changing the characteristic physical effect of the behavior of the individual who has made or actually replicated such a discovery.* That act is, therefore, as much a subject of a universal physical

13. Cf. Moses Mendelssohn, *Phaedon*. In addition to the usual literature on this work, I reference M. Kayserling, *Moses Mendelssohn: Sein Leben and seine Werke* (Leipzig: Hermann Mendelssohn, 1862), Book VI, pp. 148-183. Note the reference to Mendelssohn’s friend and admirer Graf Wilhelm Schaumburg-Lippe on p. 151. It was at Schaumburg-Lippe’s military school that Gerhard Scharnhorst was trained, under a program crafted for Schaumburg-Lippe by “The German Socrates” Mendelssohn. Such was typical of the role of the collaborators Mendelssohn and Lessing in launching the revival of Leibniz and J.S. Bach which was the German Classic of Abraham Kästner, Goethe, Schiller, Mozart, Beethoven, the Humboldts, et al.

principle as any topic in what it otherwise recognized as experimental physical-scientific knowledge.

This notion of the physical principle expressed by generation and transmission of valid discoveries of universal physical principle, as I developed that over the 1948-1953 interval, was the kernel of my original contribution to the science of physical economy, and thus the origin of my unique success as the world’s leading, published long-range economic forecaster today.

The class of universal social principles so typified, is known to European civilization’s retrospective view of the time of Thales, Pythagoras, Solon, and Plato, as the principles of Classical artistic composition, as exemplified by Plato’s Socratic dialogues. These social principles are expressed in the Classical-humanist teaching of physical science, in terms of the social relationship between the mind of the original discoverer and the students who have replicated the mental-cognitive experience of the original discoverer.

It is through that transmission, as across many successive generations, that the efficient accumulation of knowledge of universal principles, produces the increase in man’s power over nature, a transmission whose effect is expressed as increase of the characteristic potential relative population-density of the human species. Most typical of this connection, is the sudden explosion of the potential relative population-density achieved within globally extended European civilization, through the revival of the Classical Greek tradition of Plato et al., by the Italy-pivoted, Fifteenth-Century Golden Renaissance.¹⁴

Similarly, given the prevalent decline in civilization of the Mediterranean region, since about 200 B.C., following the emergence of Rome as an imperial Mediterranean power, the ebbs and flows in the culture of Europe as a whole, reflect the outcomes of continuing conflict between the Christian and Classical cultural influence, on the one side, and the Roman legacy of Augustus, Tiberius, Diocletian, et al., on the opposing side. The significance of the Islamic renaissance’s contributions to European civilization, as typified by the Abassid Caliphate’s relations to Charlemagne, and the Staufer Emperor Frederick II, are to be compared with the case of the Fifteenth-Century Renaissance on that account.

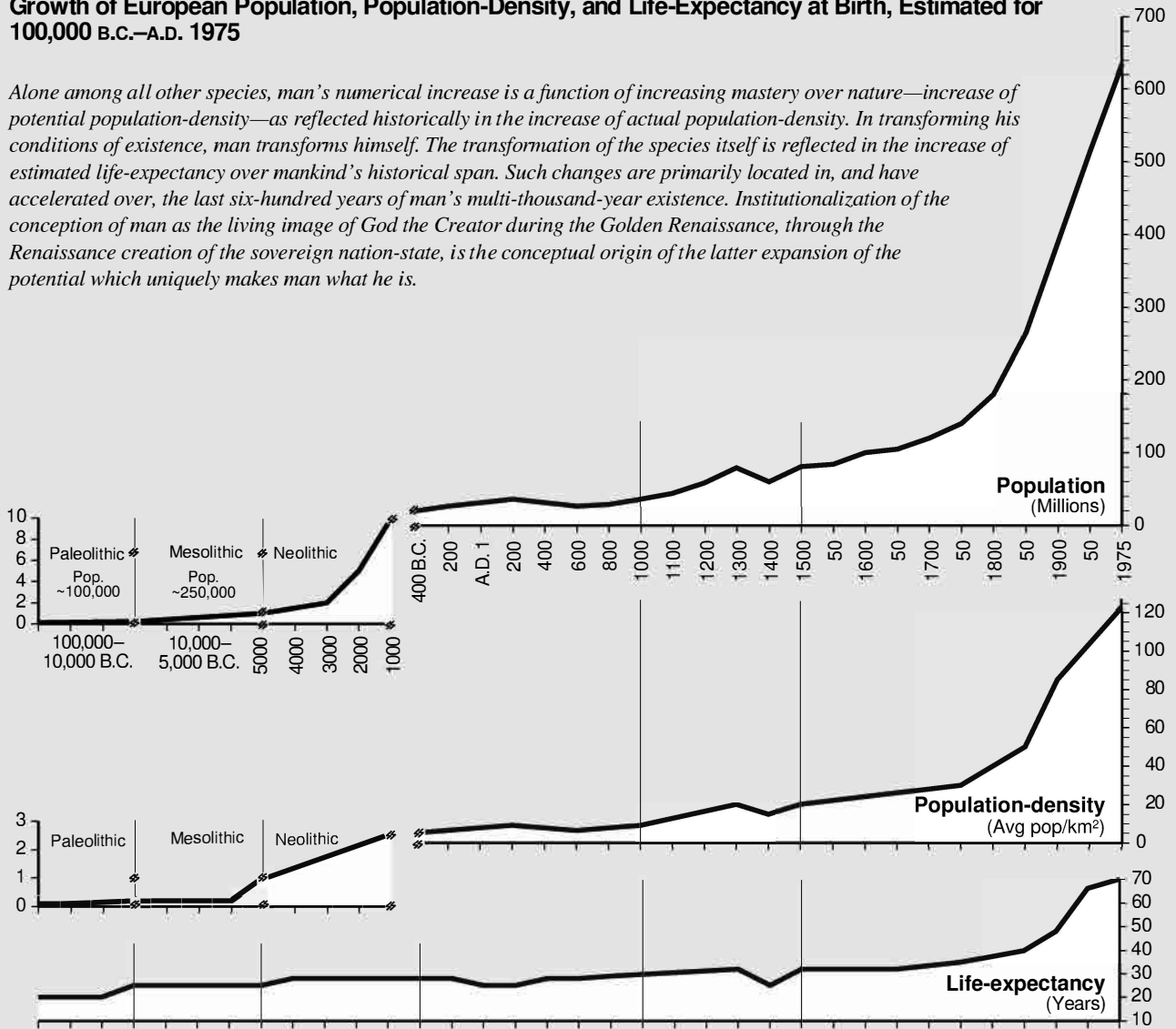
Principles, such as those of physical science, which had been prevalent in Classical Greek culture prior to 200 B.C., existed, but the benefit of those principles was not expressed in society’s development, except as the reenactment of those discoveries was transmitted through the kind of social process

14. See **Figure 1**. The Fifteenth-Century, Florence-centered Renaissance, generated a rate of improvement in human demographic potential qualitatively beyond anything in the known existence of the human species earlier. All failures of globally extended European culture since that time, have been explicitly the outcome of attempts, as by the religious warfare of the 1511-1648 interval, to reverse the Renaissance’s commitment to a perfectly sovereign nation-state, governed by the principle of scientific progress in fostering the general welfare of all of the people and their posterity, that also for the benefit (common good) of all mankind, past as well as present and future.

FIGURE 1

Growth of European Population, Population-Density, and Life-Expectancy at Birth, Estimated for 100,000 B.C.–A.D. 1975

Alone among all other species, man's numerical increase is a function of increasing mastery over nature—increase of potential population-density—as reflected historically in the increase of actual population-density. In transforming his conditions of existence, man transforms himself. The transformation of the species itself is reflected in the increase of estimated life-expectancy over mankind's historical span. Such changes are primarily located in, and have accelerated over, the last six-hundred years of man's multi-thousand-year existence. Institutionalization of the conception of man as the living image of God the Creator during the Golden Renaissance, through the Renaissance creation of the sovereign nation-state, is the conceptual origin of the latter expansion of the potential which uniquely makes man what he is.



All charts are based on standard estimates compiled by existing schools of demography. None claim any more precision than the indicative; however, the scaling flattens out what might otherwise be locally, or even temporally, significant variation, reducing all thereby to the set of changes which is significant, independent of the quality of estimates and scaling of the graphs. Sources: For population and population-density, Colin McEvedy and Richard Jones, *Atlas of World Population History*; for life-expectancy, various studies in historical demography.

Note breaks and changes in scales.

which a Classical humanist mode of education typifies.

Conversely, today, the uprooting of Classical humanist principles of education and general social practice, during the 1966-2002 interval, corresponds, in effect, to an accelerating moral and economic degeneration of globally extended European civilization, such that, with certain exceptions, the typical individuals in the U.S. and Europe who reached maturity during the recent thirty-odd years, are morally and technologically inferior to their predecessors. This decadence can be largely, although not entirely attributed to programs consis-

tent with the 1963 Paris OECD report on educational policy presented by Britain's same Dr. Alexander King who subsequently co-founded the malthusian Club of Rome.

On this account, that shortfall of Vladimir Vernadsky's definition of the Noösphere, to which I have referred earlier here, is twofold.

First, his otherwise eminently valid, experimental distinction among abiotic, living, and cognitive phase-spaces, can be comprehended efficiently only from the exemplary standpoint of Riemann's 1854 habilitation dissertation. Unfortu-

nately, Vernadsky's work does not show that he had occasion to work through that matter, to come to the point of recognizing the crucial point of functional difference between a non-Euclidean geometry, such as that of Jonas Bolyai, N. Lobachevsky, and Hermann Minkowski, and the anti-Euclidean conceptions of Gauss and Riemann.

Second, for related reasons, he does not take into account the fact, that the sovereign act of discovery of an experimentally valid universal physical principle, defines a distinct phase-space, that to such an effect that social relations organized on the basis of replication of such sovereign individual discoveries of principle, also express a distinct *cultural* principle, a principle which defines a sub-phase-space of the cognitive process characteristic of our species.

Classical Culture

These Classical principles of social relations, to be adduced from such studies, are sub-classed, as to types, by principles of a.) *Classical humanist scientific education and practice* as typified by reenacting the discoveries of such as Kepler, Leibniz, Gauss, and Riemann; b.) *Classical artistic composition*; and c.) *Classical notions of history, natural law, and related statecraft*. I have introduced the first of these three. I must now add the remaining two.

For the student, the most immediately accessible of these types, is that of a Classical approach to the so-called physical sciences. In this aspect of Classical approaches to education, the student, for example, not only replicates the sovereign act of discovery of the original, or analogous discoverer, but addresses the abiotic and living domains as objects of action by human individuals, or by relatively small groups of individuals. Thus, ostensibly, the immediate subject of physical science is the history of mankind's increase of the power of the individual, or small working groups of individuals, over the abiotic and living processes of the Biosphere.

That subject is not quite as simple as that description might suggest. For example, the relative scale of historical time, is located within the process, over thousands of years, of successive cognitive experiences, among successive individuals and successive cultures. The present-day student's relationship to Plato, Eratosthenes, and Archimedes, for example, is an immediate relationship, but the relationship of those ancients to today's pupil, is through the successive steps of progress, forward through history, up to the moment of the student's study.

Apparently, the oldest-known physical science is the combination of astronomy with transoceanic navigation. For example, European and Indian Subcontinent studies of ancient Vedic calendars, date these, from internal evidence, to dates as early as a period between 6000 and 4000 B.C., in Central Asia, when the vernal equinox was in Orion. The astrophysical implications of the great pyramids of Egypt, point toward a much more ancient antiquity of astronomy and transoceanic navigation. The founding of known civilization within Mesopotamia was done by a transoceanic culture of



Statue of Friedrich Schiller in Frankfurt, Germany. "This emphasis upon Schiller is needed to situate the modern notion of spirituality inside the same, real universe inhabited by the Creator of our universe, rather than as some different universe, the latter outside that in which we experience mortal life."

the Dravidian language-group. By physical necessity, human culture did not develop inland, toward the rivers and seas, but developed as transoceanic cultures of "peoples of the sea," who developed culture along principal inland waterways, toward the development of cultures in regions more remote from the coasts.

We know that a developed human genotype existed on this planet much earlier than 400,000-600,000 years ago. We know these predecessors were human, rather than higher apes, because of our discovery of tools of a type which no ape could design. During a span of human existence which could have been as great as, or greater than two millions years, the longest cycles determined by the organization of Solar System itself, are counted in either ice-age cycles of hundreds of thousands of years of glaciation, or equinoctial cycles of approximately 25,000 years. The Zodiac, which fascinates astrologers, expresses mankind's preoccupation with the importance of changes in the Solar System's cyclical behavior, as the great pyramids of Egypt typify this concern.

Generations of lower forms of life, each come and go. *Man alone has a history, a history of the effects of the transmission of ideas, especially notions of universal physical principle, transmitted and retransmitted over successive generations.* It is not only the discovery, but also the transmission of those principles which expresses the *noëtic* principle of cognition, which define the true clock of history. Science is as close, and as distant from me today, as Archytas and Archimedes of ancient Syracuse. Such is the distinction and relative time-scale by which those processes of change known as culture are to be measured.

The crucial topic of this review of the principles of a Classical culture, is, first of all, the fact, that the successful transmission and use of discovered universal physical principles, produces an effect within society which is comparable

to the effect of a successful genetic evolution among lower species. This effect is expressed most immediately as an increase of the potential relative population-density of the societies which adopt such an heritage of progress, and, also the relative misery of those cultures which do not.

Thus, the transmission of adopted valid discoveries of universal physical principles, as from Kepler, causes ideas of that type to function as what might be fairly termed “super-genes.” The replication of the valid universal physical principles, as the knowledge for practice of successive generations, has the effect of the virtual biological evolutionary species-upshift of the society which adopts those principles.

“Evolutionary” changes of such a quality, define the appropriate, *anti-Kantian* meaning of *truth*. This principle of truth, as it applies within physical science, also applies with full force in setting Classical artistic composition into opposition to the decadent parodies produced by the Romantic or modernist composer or performer. Classical art produces nothing but truthful statements; Romantic or modernist parodies merely produce, sometimes as “art for art’s sake,” sensual or intellectual effects not intended to be subjected to a standard of scientific truthfulness.

Classical Drama and Truth

In the Classical tradition, the definition of “truth” for both physical science and art, reflects the conception of Heraclitus and Plato, that nothing is permanent (universal) but change. Truth lies not in a series of perceived events; truth lies in the power to change the ordering of a series of perceived events, that in a way which solves an otherwise unconquerable ontological paradox of perception. That reflects that distinction between sense-perception and knowledge, which I have emphasized here. The recurring ontological paradoxes of sense-perception, shows that what we experience as sense-perception, is often false. It is those valid discoveries of principle which increase man’s power in and over the universe, which are true.

Thus, for the literate mind, sense-perception becomes a perpetual puzzle, challenging the individual to discover those new solutions of the type known as valid universal principles. It is our ability to demonstrate the validity of proposed solutions, through forms of practice which increase mankind’s power in and over the universe, which is the test required. It is our ability to *change* our relationship to reality, to increase man’s power in and over the experienced universe, through such discovered principles, which serves us thus as a provable standard of truth.

All valid expressions of Classical artistic composition, meet that Heraclitus-Plato standard of truth. The problem posed to us, in looking at Vernadsky’s view of the Noösphere from the standpoint of Classical principles, is to locate the efficient connection between the function of artistic truth, and a genetic-like quality of evolutionary upshift of a society’s potential relative population-density.

Schiller’s dramas are exceptionally notable for the inten-

sity of their fidelity to the actual history of the matter addressed within the drama. On this account, von Wolzogen’s studies of Schiller’s treatments of the Netherlands and Thirty Years wars, pointed to the specific doctrine of strategic defense, for defeat of Napoleon, which the Prussian military presented to Czar Alexander I. Even Schiller’s use of some limited dramatic license, in dramas such as *Don Carlos* and the case of Jeanne d’Arc (*The Maid of Orleans*), was not allowed to lead the audiences to views contrary to the essential features of the actual history. Even where great dramatists, such as Shakespeare, used legends as thematic material, the tragedy portrayed was a reliable, and therefore truthful lesson in statecraft. As Schiller argued, the function of the theater is to transform the audiences into better people leaving the theater than had entered it. The latter result is not accomplished by “moralizing,” but only by providing the audience a sense of the cognitive experience of truthfulness in matters of statecraft.

The relationship of the intended audience and the composition of the Classical drama, especially Classical tragedy and related modes, is the same as that of a student in a Classical humanist educational program to the re-experiencing of an original valid discovery of a universal physical principle. The art of composition and authentic performance of a great Classical drama, such as those of Shakespeare or Schiller, lies in the establishing of a cognitive relationship between the drama and the audience.

It is the same with Classical poetry. The essence of poetry is those forms of Classical irony which reach their peak of intensity with true metaphor, without any inclusion of symbolism intended by the composer. All such irony and metaphor tease the cognitive powers of the individual mind, by appealing to a sense of ontological paradox, as through irony, metaphor, and the subjunctive mode. The test of the quality of a Classical poem is the degree to which the available resolution of the irony is a truthful one. The basis for that content of the poem, lies in the composer’s recognition of the falseness of sense-certainty: the progress of humanity in the world is not managed by reaction to objects of sense-certainty, but by discovering the efficiently existing, real objects lurking, unseen, behind the illusory shadows of sense-perception.

Compare the great dramatist and actors, from the time of the Classical Greek tragedies, to the present-day Classical professionally developed actor.

One famous fool, asked why he had pursued a stage career, replied, “Look at me!” He desired to be admired as an object, like a “Hollywood star,” on stage. The competent professional actor would never desire to do such a thing. He would speak through the mask. His, or her stage, is the stage described by Shakespeare’s Chorus, at the opening of *Henry V*. He would not be that which the audience sees with its eyes, but a figure on the stage of the audience’s imagination. He, or she, on stage, is but the shadow of the object to be found within the imagination of the member of the audience. Some call this an illusion; contrary to that opinion, it is the truth



The Battle of Agincourt in Kenneth Branagh's film of Shakespeare's Henry V. By leaving nothing to the imagination of the audience, Hollywood's version "prefers to embalm it for display, making it a lifeless relic of the composer's living intention, returning from the standard of Greek Classical sculpture to the tombstones of the Archaic."

which the senses attempt to falsify.

Nothing good were accomplished by staging *Henry V* on a Hollywood screen's attempt at sense-certainty. Quite the contrary: seek to show the actual horses, the wide fields, and so forth, and the purpose of the drama is more or less lost. The focus is shifted from the stage of the imagination. Put the play on a box stage, within the auditorium of a seated audience, and you bring the drama to life; Hollywood prefers to embalm it for display, making it a lifeless relic of the composer's living intention, returning from the standard of Greek Classical sculpture to the tombstones of the Archaic.

It is the mind, not the eyes and ears, that can see and hear that principle of universal gravitation discovered by Kepler. With the mind, the power of gravitation is actually experienced as an efficient principle; with the eyes and ears, is it only the delusory impression of a symbolism. To seek to make matters of principle sense-perceptible, does not enhance comprehension, but destroys it, as the charlatan's magic numbs the comprehension.

Classical poetry works thus. Classical drama and poetry, are not fiction, but instruments of truth, devices by means of which the power of posing and imparting truth is cultivated in the minds of the people, thus equipping them to communicate the most important subjects worthy of their attention. Thus, great Classical art produces better people than could otherwise be made, from among their audiences.

Compare this case, with that for Classical music.

Classical Music and Truth

Since the victims of recent generations' exposure to contemporary education and culture, have, only rarely, experience and less knowledge of any music which is not more or less dionysiac rant, it is essential that I begin my treatment of this topic with a few preliminary points of orientation.

Classical music has very ancient roots, which are, by their

nature, characteristic of the specific mental-physiological characteristics of the human individual. Our ancient evidence to that specific effect, comes from traces of the impact of ancient languages, especially polyphonic poetry. The modern Classical European musical culture traces its origins chiefly from the Classical Greeks, including the work of Plato, through such Arab thinkers as Al-Farabi, into the clear definition of the characteristics of the human singing voice by the Fifteenth-Century Florentine school of *bel canto* voice-training, and the pioneering work in defining the scientific basis for this by Leonardo da Vinci and the related work of Johannes Kepler.

These adducible characteristics have been recognized by relevant specialists, as embedded in the characteristics of languages in general

However, what may be strictly defined as the Classical European musical tradition, emerged around an intersection of the continuing influence of the Fifteenth-Century Italian *bel canto* school with the circles of Handel and J.S. Bach. It was Bach's rigorous development of *bel canto*-based, well-tempered polyphony, which defines all that which can be rationally identified as Classical standards of musical composition and performance, from the work of Bach himself through Johannes Brahms and his circles. The relationship of Classical composition to the setting of Classical poetry and drama, as by Handel, Bach, Mozart, Beethoven, Schubert, Schuman, Verdi, and Brahms, expresses the deepest and broadest significance of the spiritual principles involved: that in the sense I have defined spirituality, above.

The contrary, Romantic school of Rameau and Fux appeared afresh in the early Nineteenth Century, with Czerny, Liszt, Berlioz, Wagner, et al. The latter were, largely, contemporaries of strictly Classical polyphonists such as Haydn, Mozart, Beethoven, Schubert, Mendelssohn, Schumann, Verdi, and Brahms; the distinction of these Romantics is that they



Bel canto singers, sculpted by Luca della Robbia. The bel canto method of Classical singing is indispensable for the communication of real musical ideas.

parodied those Classical composers' palette of Classical polyphony eclectically, while rejecting the principles of reason on which Classical composition and performance depended. What followed the Romantics down the pathway of continuing cultural decadence, under the rubric of modernism, has been increasingly arbitrary, usually insolent, and artistically sterile, especially since the influence of Theodor Adorno's Frankfurt School.

The principal significance of modern Classical musical culture, from J.S. Bach, most notably, to the present, is located in two, central physical characteristics. First, it excludes any so-called theory of purely "instrumental music," and locates the evolution, function, and standards for performance of the non-vocal instruments, in their role as imitators of the qualities of the *bel canto* singing voice. Second, is, as I have emphasized repeatedly on other occasions, the qualitative enhancement of the Classical poetry reworked as a Classical musical composition. These two considerations must be examined to understand the proper role of the characteristics of the *bel canto* speaking/singing voice, in the communication of those kinds of ideas which pertain to the process of generation and proliferation of valid universal physical principles.

This kind of importance of sung prosody did not begin with Bach; Bach, following an approach consistent with the successive work on musical principles by Leonardo da Vinci and Kepler, solved a fundamental problem of principle with his discovery of the principles of well-tempered counterpoint already inhering, implicitly, in the physical characteristics of the *bel canto* singing/speaking voice. One should be able to recognize the relevant distinctions in hearing the way in which an ostensibly educated person delivers, or ruins a Classical English poem, such as one of those of Shakespeare, Keats, or Shelley. Instead of speaking or singing on the stage of the audience's cognitive imagination, they are Sweet Little Miss Midget, curtsying to the audience assembled for the chil-

dren's recital: "Look at me!"

As I have written, above, the goal of the literate speaker is to speak as Franz Schubert intended the sung poem to be heard, as the relatively simple *Erlkönig* or *Gretchen am Spinnrade* implicitly demands.¹⁵ Put on the Classical mask of music, speak to the stage of the cognitive imagination, and see the surprise on the audience's face, when they are startled to recognize, at the end of the performance, that it is you, the mere performer, standing there on stage, rather than the grand personality you had been in their imagination a moment earlier.

The significance of Bach's work to this effect, can be shown by superimposing the relevant, voice-specific set of singing-voice registrations, relative to C=256, upon the score of Bach's celebrated *The Well-Tempered Clavier*. A comparison of the second, C-minor fugue of the First Book, with the content of his later *A Musical Offering*, opens the gateway to all subsequent Classical composition. *The Art of the Fugue*, studied from that vantage-point, clarifies matters still further.

In such pioneering work by Bach, we are presented with a key for understanding the way in which a Classical form of Platonic ontological paradox works. The contradiction implicitly embedded in a single contrapuntal statement by Bach, demands a cognitive resolution according to a set of variously stated, or potentially implied principles of development. For a quick introduction of the student of music to this point, extend the subject of the second fugue from the First Book through and beyond the examples provided by *A Musical Offering* and *The Art of the Fugue*, through the treatments of the same germ musical idea by Mozart, Beethoven, Schubert, Schumann, and Brahms, among others. This, taken together with the related role of a series of Lydian intervals in works as simple as Mozart's *Ave Verum Corpus*, is to be recognized as a central point of reference to Bach throughout the greatest part of all Classical musical composition through Brahms.¹⁶

15. See reference to Gustav Jenner on Brahms, in *A Manual on the Rudiments of Tuning and Registration, Book I*, John Sigerson and Kathy Wolfe, eds. (Washington, D.C.: Schiller Institute, 1992), Chapter 12. Like Brahms, Beethoven also emphasized that poets inferior in ideas and sense of musicality to Friedrich Schiller afforded composers the most generous opportunities for improving the poem through a musical setting. Schiller's sometime collaborator Goethe, was fortunate in his richly ironical sense of musicality and the treatment his poetry received at the hands of such great composers as Mozart, Beethoven, and Schubert. Passionately anti-Romantic Heinrich Heine enjoyed the favors of Schubert and, emphatically, Robert Schumann. The greatness of art lies not in the medium as such, but in the nested ironies which the medium is used to convey. It is the ironies which generate the ideas. A great composer has often transformed a little poem, presenting the song as heard by the composer, rather than the relevant poet. So, in drama, a great actor and director can infuse the beauty of ideas into a drama otherwise of mediocre relevance.

16. A related case is found in the way in which a remarkable development, in measures 76-87 of the second, Adagio Sostenuto movement of Beethoven's Opus 106, reappears in Brahms' Fourth Symphony. Compare this with the Coda of the last movement of Beethoven's Opus 111, in which Beethoven references Mozart's K. 475 reference to Bach's *A Musical Offering*.



Rembrandt's "St. Paul." Johannes Brahms drew on St. Paul's conception of "agapē," in I Corinthians 13, for his "Four Serious Songs"—in effect, Brahms' last will and testament.

In those relations among Classical composers, we are confronted by the same kind of dialogue characteristic among the greatest scientific discoverers, as from Plato and his Academy, through Cusa, Leonardo, Kepler, Leibniz, Gauss, and Riemann. Each and all employ the method of hypothesis to solve strictly defined ontological paradoxes. Most of them reference, more or less explicitly, the work of predecessors, even across millennia. The same principle of truth, which is demanded of Classical scientific minds, is demanded of all Classical composers and performers, just as John Keats' famous emphasis upon truth and beauty attests.

In both Classical science and Classical musical composition and performance, the relations among the generations of experimentally valid universal principles, are the characteristic feature of each, and of both, as a social process. Just as Kepler's and Gauss's most crucial discoveries appear as a dialogue with the Classical Greek circles of Plato and his Academy, so the principles expressed by modern European civilization's development of the well-tempered polyphony of Bach through Brahms, assume the dynamic form of a dialogue among the discoverers and developers of universal physical principles.

The same appears in Classical plastic art. In the best examples of Classical Greek sculpture, the earlier "tombstone-like"

sculpture is superseded by the capture of a figure in the mid-motion expressing both the principle of life and the permanence of nothing but change. The principles involved are made explicitly clear by Leonardo da Vinci's revolution in perspective, and the continuation of that by Raphael Sanzio and Rembrandt.

In Classical artistic composition, as in Classical science, the essence of humanity, as a species of creative individuals, is made a subject of human consciousness. Reality lies between the cracks in the shadow-world of sense-perception. It is the active connection among the transmissions of valid universal principles, as from one generation to another, which expresses the quality of humanity as a species, rather than isolated individuals. It is the ability of the individual, to locate himself or herself as an efficiently acting individual in that process, which imparts to the mortal individual a well-defined sense of a permanent quality for the individual's mortal existence.

Classical History

To the degree the individual's motives, as a mortal actor, are premised upon devotion to causing the progress of the condition of future humanity to move forward, and to adopt, also, a sense of obligation to bring into actuality the unrealized worthy accomplishments of persons from earlier times, the mortal individual gains not only a sense of fully efficient permanence of mortal existence, but a sense of a sublime purpose in the mortal individual's existence.

What we should recognize as Classical art, is thus to be recognized not only as the expression of spirituality, but as an efficient intention, the appropriate expression of an efficient force without which the willful achievement of human progress would not exist. Lacking that commitment to progress, man would cease to be a species above the beasts, and would tend to behave as a beast, not as made in the image of the Creator. The idea of a mission to further progress, an idea of the beauty of progress, is the most powerful force within our universe.

The combined study of Classical science and principles of Classical artistic composition, represents the foundation for a comprehension of a science of history. This means *history* as distinct from mere chronicles, or the mere interpretative commentaries on chronicles of human existence. History, in the Classical sense of the term, combines the notions of scientific and technological progress with the lessons of the Classically defined cognitively truthful notions of the tragic and the beautifully sublime. For reasons I have already given here, a Classical science of history signifies the subjunctive view of the historical process, history as essentially matters of irony and metaphor.

The history of mankind, and of the societies of which the whole of mankind is composed, is defined as the relationship of the cognitively defined individual to an intentional process of development of all human existence, past, future, and pres-

ent. History is man either acting to affect all past, future, and present society's progress, or failing to act so. It is the principled intention of that individual toward all mankind, which must be the focus of attention, as the Apostle Paul argues the principle of *agapē* to that effect in the *I Corinthians* 13 which Johannes Brahms referenced in the *Four Serious Songs* which are, in effect, Brahms' essential statement of his last will and testament.

This brings us to a deeper conception, to which I turn your attention now: the implications of Plato's treatment of the subject of the five regular (Platonic) solids, as emphasized by Leonardo da Vinci, and as this argument was elaborated for the founding of mathematical physics by Kepler.¹⁷ The purpose of this needed intellectual excursion, is to define the meaning of *intention*, as I have, once again, applied that term immediately above.

4. The 'Golden Section'

The original development of an actual mathematical physics, by Kepler, featured the measurement of an harmonic ordering among the Solar orbits, according to the ratio of the differences between the values of each orbit when it is, respectively, relatively nearest and most distant from the Sun. The relative values of these ratios defined a musical scale. These measured values corresponded in their principled form to Plato's treatment of the musical scale and related matters.

Plato's treatment of the matter, as in the *Timaeus* dialogue, references the fact that only five kinds of regular solids can exist within what passes for a Euclidean solid geometry. The characteristic feature of the geometrical construction of these solids, as a series, is an apparent *geometric* ratio termed "the Golden Section." Kepler addressed this issue in a celebrated, shorter work on the subject of the snowflake.¹⁸ Kepler showed a pattern, in which the Golden Section was a geometrical characteristic of living processes, as distinct from non-living (abiotic) processes such as the snowflake. This was consistent with Plato's argument to similar effect.

Now, for the purpose of the discussion of the meaning of historical *intention*, look at those matters from the history of science from the reference-point of my earlier, summary description of a three-phase-space Vernadsky universe. The crucial point, as Plato and Kepler emphasized, is that a universe, or phase-space characterized by the appearance of the Golden Section in "Euclidean space" terms of reference, is found only among living processes, not abiotic ones. The first

17. *Harmonice Mundi* (1619). For an English translation, see *The Harmony of the World by Johannes Kepler*, E.J. Aiton, A.M. Duncan, and J.V. Field, trans., (Philadelphia: American Philosophical Society, 1997).

18. *De Nive Sexangula* (1611). For an English translation, see *The Six-Cornered Snowflake*, Colin Hardie, trans., (Oxford, U.K.: Oxford University Press, 1966).

question to be posed by us at this moment is, what does this mean in the language of mathematics?

As indicated earlier, the most important issue debated within mathematical physics, is whether physics is a branch of mathematics, as Lagrange implied, or mathematics a branch of physics, as Plato, Kepler, Leibniz, Gauss, Riemann, and others insisted.

For the case of geometry, the case for physics was proven by Plato and others of the ancient, pre-Roman Empire, Classical period, who demonstrated the case for the squaring of the circle, the cube, and the Platonic solids.

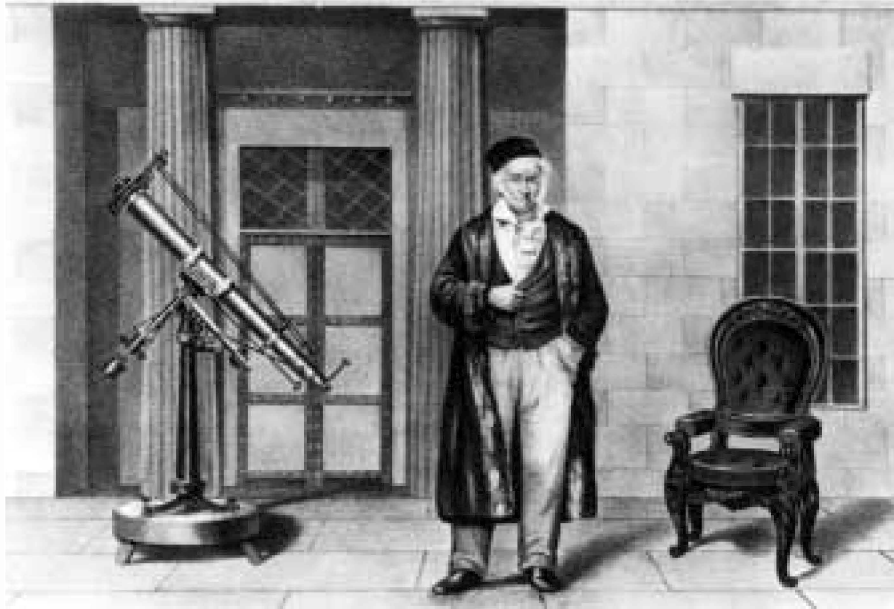
In modern times, the ivory-tower mathematicians, such as the Aristoteleans and empiricists, argued that the line defined by the counting numbers, was not only independent of geometry, but, that since measurement must be made in a way consistent with the notion of the counting numbers, the geometric line could contain no properties which were inconsistent with the concept of the counting numbers.

The elementary case against that argument based on the notion of counting numbers, was made by the famous student of Kästner and Zimmerman, Carl Gauss. Most notable were Gauss's *Disquisitiones Arithmeticae* in general, but also his 1799 fundamental theorem of algebra, and his second paper on biquadratic residues.

In the case of the 1799 report on the fundamental theorem, Gauss refuted the empiricist argument of D'Alembert, Euler, and Euler's follower Lagrange, by demonstrating the reality of what he defined as the complex domain. Gauss's case for quadratic and cubic functions, amounted to a restatement of the ancient Classical case for the geometric doubling of the square and cube, but from the standpoint of arithmetic. Plato and his Academy had emphasized that no line can generate a surface, or a surface a solid; thus, the surface is a physical existence of a higher *power* than a line, and a solid of a higher *power* than a surface. This notion of *power*, introduced to such cases by Plato, was carried over directly by Gauss into the distinction in *powers* of line, surface, solid, and so forth, in algebraic functions.

The action which defines the functional relations among elements of such powers, is a quality of existence which is reflected in the complex domain, as the doubling of the cube, and the extraction of cube roots, demonstrates that point with relatively greatest simplicity and elegance. The case of the biquadratic residues provides a kind of generalization of that point. These powers express the efficient role of *change*, in the sense of Heraclitus-Plato as the characteristic form of the real action controlling changes in the behavior of the shadows in Plato's Cave. They represent the relatively most rudimentary mathematical-physics notion of a universal physical principle.

Such a principle, so conceptualized points to the meaning of *intention* as Kepler equated intention, the *Creator's intention*, in defining his own discover of a universal physical principle of gravitation.



Carl Friedrich Gauss. His 1799 refutation of D'Alembert, Euler, and Lagrange, refutes the fundamental error underlying the "ivory tower" follies common to all empiricist and positivist misconception of the elementary principles of a mathematical physics.

All of those considerations just indicated for the elementary notion of the generalized complex domain, must be applied to the seemingly anomalous implications of the five Platonic solids. A close scrutiny of the implications of Gauss's *Disquisitiones Arithmeticae*, gives important hints.

Anomalies of the number field pointed toward the fact, that the integers were not generated by counting, but in a way consistent with modularity, and consistent also with the notion of the division of the circle in defining circular action. The point is, that Gauss's treatment of the fundamental theorem of algebra, showed not only that geometric considerations so located, defined the universal properties of the number field, but that these geometric considerations were rooted in physical considerations of the same elementary type as Kepler's equation of intention and gravity.

Similarly, the universality of the case for the five Platonic solids, and related implications of the Archimedean solids, reflects the following general set of principles.

First, since living and non-living processes have functionally and mathematically distinct geometries, but occupy the same universe, this reflects the fact that the universe is composed of distinct, but interacting phase-spaces, as Kepler repeats that point in his paper on the snowflake. Two points follow. That the two geometries interact physically, as distinct powers (in Plato's sense), but that the living is superior to the abiotic, as Vernadsky shows in his argument, based in biogeochemistry, for the Biosphere. The fact that, among particular species within the known universe, only the human mind is capable of the higher form of efficient anti-entropic intentions, defines a third phase-space.

That outline of the argument given, now let us return our attention to the matter of the *intention* of the human individual and of that individual's society.

Leibniz and Constitutional Law

The U.S. Constitution of 1787-1789 is unique among all known constitutions, in the respect that the entire document is subsumed by a universal principle, as expressed in its Preamble. Other documents described as "constitutions," were better described, not as constitutions, but as "basic law," being essentially a form of the merely positive law, but a portion which has been assigned a superior place in the hierarchy of law in general. What may give a body of "basic law" some of the appearances of a true constitution, is the fact that special considerations and procedures are required to modify it.

The U.S. Preamble has three leading characteristics, two stated, and one implicit in the role of the Preamble as the intention to which all other aspects of the Constitution are forever subject. The first two principles are, first, the principle of the perfect sovereignty of the nation and its Constitution, and, second, the obligation of government and its actions to promote the general welfare of all the living and their posterity. The third characteristic is implicit, that no subsidiary part of the Constitution may be defined in a way contrary to the requirements of the Preamble.

There is a fourth principle, neither within the Preamble, nor implicit, but one of the greatest general importance for the nation: the notion that the goal of the existence of the perfectly sovereign nation-state depends upon the establishment of a certain ecumenical order among a community of respectively perfectly sovereign nation-states. Secretary of State John Quincy Adams' commitment to a future community of principle among the respectively perfectly sovereign nation-state republics of the Americas, illustrates the point.

The U.S. had the advantage of being established by aid of the intention of influential and other persons from many European states. In addition, the leading influence among Benjamin Franklin and others was, first, that of Leibniz, whose unique conception of "life, liberty, and the pursuit of happiness" is central to the 1776 Declaration of Independence. Additionally, the interval 1763-1783, during which the U.S. struggle for sovereign independence was conducted, was a period of a great resurgence of the Classical scientific



The U.S. Constitutional Convention. Under the exceptional Eighteenth-Century conditions of the development of the U.S. republic, "the influence of Leibniz was most crucial in many respects, including that American System of political-economy as described by, among others, Treasury Secretary Alexander Hamilton."

and cultural ferment within Europe. This combination of exceptional advantages and situation enabled the young U.S.A. to craft a form of true nation-state republic, whereas the progress of freedom in Europe, for example, tended to follow the pathway of least resistance, the transformation of the feudal parliamentary institutions into more or less fair approximations of true governments.

The preservation and strengthening of the Constitution under the leadership of President Abraham Lincoln, and the rescue of the U.S.A. by President Franklin Roosevelt, reflect, in large degree, the exceptional advantages which history gave to our creation.

Under those referenced, exceptional Eighteenth-Century conditions of the development of the U.S. republic, the influence of Leibniz was most crucial in many respects, including that American System of political-economy as described by, among others, Treasury Secretary Alexander Hamilton.

The immediately preceding set of observations seem to bear chiefly on the U.S.'s potential role in efforts at ecumenical fraternity among peoples. I have raised them here with a somewhat different problem in view. I have cited the preceding points to illustrate actual historical developments which illustrate certain principles of general importance to the ecumenical cause in general.

Among such points is the fact, that although it should be possible now, that no new general wars among nations should be fought, the conditions for the outlawing of war do not yet exist among prudent and sane men and women. Rather, were just warfare unavoidable, the policy for conduct of such warfare, must be establishing the necessary preconditions for a just and enduring peace. On that account, *it should be considered obligatory among Christians, as among others, that a*

ecumenical peace of faiths be established. Such a peace will be a serious proposition, only if certain of its implications are recognized and accepted.

The crucial point illustrated by the case of the U.S. Constitution of 1789-89, was and is the issue of defining a functional conception of *intention*. The Preamble of the U.S. Constitution premises the lawful existence of the U.S. Republic upon a lawful intention underlying the existence of the sovereign nation-state republic. This intention, when observed, has the effect of a universal physical principle, one no less awesome in quality than universal gravitation.

However, it not simply a personal intention to do good. It is the intention that succeeding generations after you, shall be committed to an intention to create good. This is an intention of the second order, as a commitment to promote scientific progress is of a higher power than a commitment to a specific set of universal physical principles. It is an *intention* to embed a passion for the promotion of endless scientific progress in succeeding generations. Such an intention must have the quality of a passion, a passion called *agapē* by Plato and the Apostle Paul. It is a love of mankind, as mankind, a love for that quality of human nature which sets our species absolutely above the beasts, as a creature made in the likeness of the Creator of the universe.

This quality of intention, this quality of love, has a name. That name is the *natural law*, as the Leibniz-informed crafting of U.S. constitutional law defined the natural law as intention for practice.

We must not seek too much, all at once, in our ecumenical efforts. We must aim to accomplish much, in due time, but to enjoy one another's company in the journey to that common goal. Such must be our intention.