

The Subject of Principle: Project 'Genesis'

by Lyndon H. LaRouche, Jr.

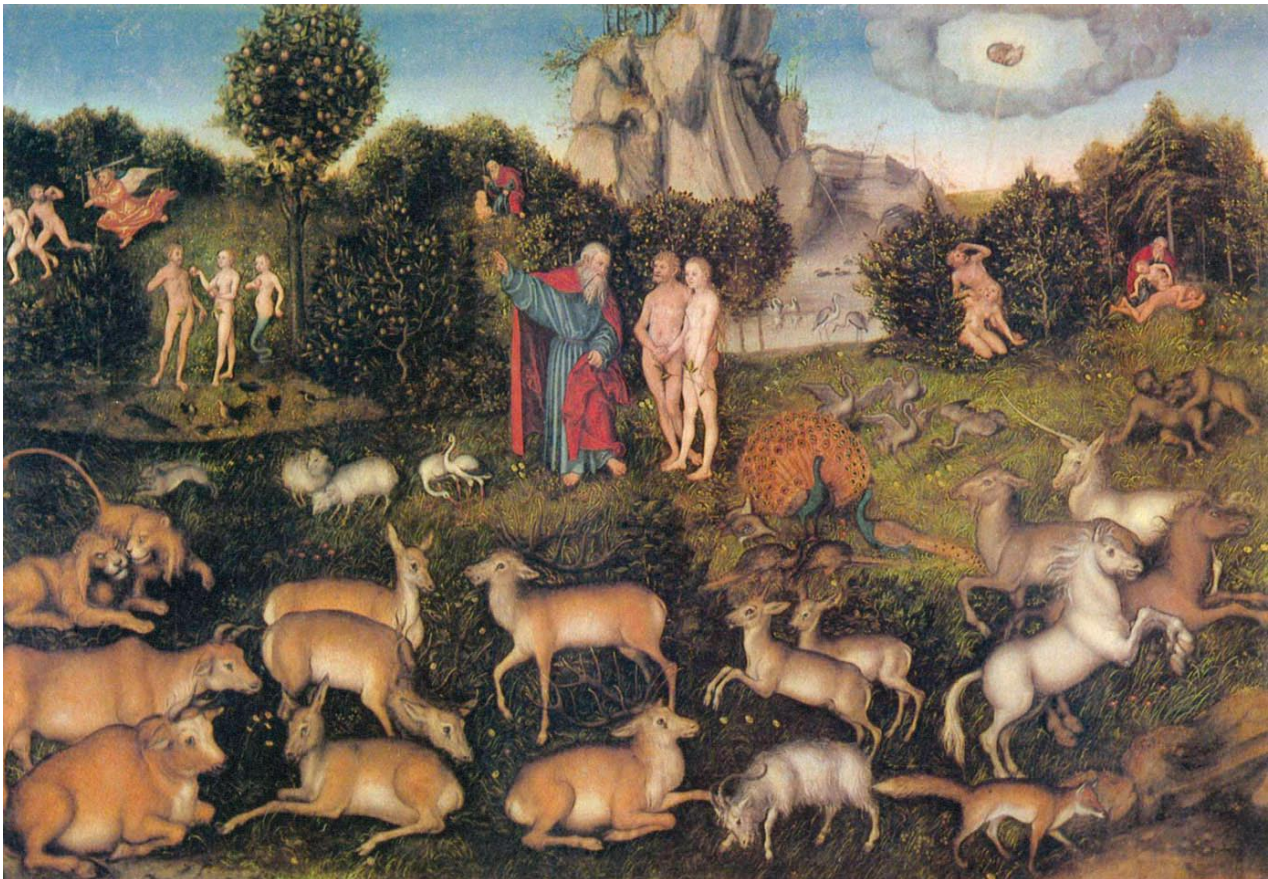
March 14, 2008

Originally published in *Executive Intelligence Review*, April 11, 2008

Here, reference is made to the work of the circles of Carl Woese, et al., particularly to "Collective Evolution and the Genetic Code"¹ of Kalin Vetsigian, Carl Woese, and Nigel Goldenfeld of the Department of Physics and Microbiology and Institute for Genomic Biology, University of Illinois at Urbana-Champaign, Urbana, Ill. 61801, May 16, 2006.

My critical contribution here is limited to certain very important issues of epistemology ►

1. See www.pnas.org/cgi/content/abstract/0603780103v1.



"Paradise," 1530 oil painting on wood by Lucas Cranach the Elder

"The Noösphere is derived from a universal physical, cognitive principle of human life, a power of organization which does not exist within the species of the lower forms of life, such as the higher apes." Only man is able to increase the potential relative population-density of his species.

which have been posed implicitly by the pattern of an underlying assumption in the method employed there by Carl Woese and his associates. This present report emphasizes a return of attention to that argument of mine, which is rooted in the cognitive implications of Bernhard Riemann's work, which I presented in my "Vernadsky & Dirichlet's Principle," of Executive Intelligence Review for June 3, 2005 [also in 21st Century, Winter 2005].

Among those at Executive Intelligence Review who continue the contested themes of issues which occupied attention among the circles of the Fusion Energy Foundation (FEF) of the 1970s and 1980s, the work of Carl Woese et al. has been seen as a refreshing change of pace from the radically reductionist approaches to living processes which became popularized both during the 1930s, and more so during the post-World War II aftermaths of a certain radically empiricist influence on scientific practice. The latter has been a practice typified by what has become known as the Cambridge Systems Analysis school of the followers of not only the eccentric Ernst Mach, but, most emphatically, Bertrand Russell et al., as, for example, at the Laxenberg, Austria International Institute for Applied Systems Analysis (IIASA).

The topic of this report is, that the piece by Woese et al., referenced here, with its otherwise commendable emphasis on dynamics, errs in one important feature of *method*. It errs by seeking to argue the arguments bearing on matters of physical principle, within an implicitly hostile set of currently hegemonic statistical methods; they have apparently overlooked some essential matters of principle, principles which, however, stand outside the territory in biology staked out by them for the purpose of their report.

Therefore, my criticism here is not focussed upon the details of their reports on experimental findings within their implicitly assumed choice of sub-domain of the biology of living processes as such. My attention is focussed here on *principles which they do not bring into play*. They do not confront the problematic features which arise in any effort to build arguments in which it is presumed, implicitly or otherwise, that the role of mankind within biology, must be bounded by a certain commonplace assumption respecting statistical method of practice. It is also crucial that they omit the relevant issues of the ironical nature of the reciprocal interrelationship between, and interaction of the Biosphere and Noösphere. For my purposes, those omissions tolerate a mistaken presumption, a fallacy of composition, the assumption, which I believe is contrary to their intention, that scientific knowledge may be permitted to be built up in proofs which proceed from unproven, merely *a prioristic* presumptions, such as those underlain by the persisting influence of Euclidean and Cartesian geometry upon widely employed statistical methods.

This might be mistaken by those authors for "nit-picking" by me. It is not, as the unfolding of my argument here will show.

The typical such mistaken presumption is, that the build-up of knowledge must occur, statistically, through a succession of,

first, the chemistry of non-living processes, second, then continued through the domain of the Biosphere, and, thence, continued by implication, into, third, the uniquely specific *differentia* exhibited by the human species. My approach proceeds, as I show here, in the opposite direction: from the Noösphere, downward, to the Biosphere, and, thence, to, statistically, the relatively simplistic, subsumed, reductionist's view of the Periodic Table of elements and their isotopes.²

Unfortunately, today's prevalent use of statistical method of interpretation of evidence itself, which I challenge here, has tended to be taken in the usual practice of that profession as some magical authority over nature, the authority of that statistical mysticism inherent in *a priori* mathematical methods, such as those of those reductionist forms of Sophistry known as Euclidean and Cartesian geometry.

Worse, today's practice is usually dominated by that axiomatically irrationalist doctrine of modern philosophical Liberalism which is derived from the precedent of the medieval irrationalist William of Ockham. I refer, with emphasis, to the continuing, hereditary influence of the doctrine of the founder of modern European Liberalism, Paolo Sarpi. This is what was established in the form of what became Anglo-Dutch Liberalism and its impact on practiced scientific method, as by Descartes, de Moivre, D'Alembert, Leonhard Euler, and Joseph Lagrange. Even worse, today's practice is dominated by the radically positivist versions of that Liberalism, the degenerate form associated with the emergence of the successive influences on the subject by Ernst Mach and Bertrand Russell on mechanics, and by the even more radical extremes of Russell's *Principia Mathematica*.

If there is one most crucial fact shown by science to date, it is that the universe is neither Euclidean, nor anything resembling that.³ I protest against the use of a perverted notion of what are inherently arguments premised upon presumptions of an *a prioristic*, digital statistical consistency, arguments derived from such arbitrarily chosen ideological origins, and then employed without regard for the bias expressed by those assumptions, which, in turn, are adopted as a standard for "objectively" interpreting physical-experimental evidence. This is typified by what is, presently, the greatest, most prevalent, single ideological barrier to academic or comparable progress in scientific thinking and in crafting economic policy today.

My Method in Physical Economy

My principled approach to the subject which I present here, addresses the fallacies inherent in the use of the inherently reductionist, so-called statistical methods, as, most emphatical-

2. Distinguishing those isotopes of the table which are tuned specifically to living processes.

3. Cf. Lyndon H. LaRouche, Jr. "My Early Encounter With Leibniz: On Monadology," LPAC, Jan. 22, 2008. Also in *EIR*, Feb. 2, 2008.

———"A Strategic Economic Assessment: That Doomed & British Empire," *EIR*, March 14, 2008.

ly, when such methods are used in treating *the subject of what is the inherently willful characteristic of that which drives human behavior*, as if the lack of those relevant distinctions respecting the role of human behavior might be an appropriate omission in any treatment of other, lower types of living processes.

The most important feature of anything when it is first encountered, is what it is not. Thus, the effect of the omission of the Noösphere's indispensable authority for defining the subsumed Biosphere of today, is the problem which, for example, threatens the referenced line of work by Vetsigian, Woese, and Goldenfeld. On this account, I define the proper choice of method in any competent branch of practice of physical science itself, as in the special branch of physical science represented by the subject of economy, as reflecting a *willful* treatment of the relevant subject-matter from the standpoint of *willful human* behavior, on the presumption that such subjects cannot be simply predictable in categorically statistical (e.g., *a priori*, as in Euclidean) or similar ways.⁴

Since the time of the discovery, by very ancient celestial navigators, of that power for change of the stellar universe, which is therefore the intrinsic power defining the reality within which we dwell, we must recognize that any branch of competent science, since actual science was developed out of the practice of celestial navigation, has always been *the practice of the continuing of that process of discovery*; thus, there is the discovery of those principles whose process of accumulation implicitly defines the mind of the human individual. In other words, to sum up the conclusion to which those considerations must lead us: we must proceed in today's science from the generative, Riemannian standpoint of V.I. Vernadsky's *Noösphere*, downwards, which are the true fundamentals, toward the functionally subsumed subjects of the Biosphere and inanimate nature.

So, from this standpoint, we should situate the treatment of sub-human biology, the Biosphere, under the higher authority to which it is subject, a higher authority which exists



William of Ockham (1287-1347)



Engraving by George Vertue, 1736

Paolo Sarpi (1552-1623)

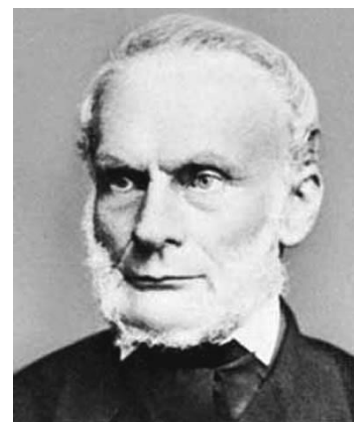


René Descartes
(1596-1650)

The founders of modern philosophical Liberalism and the later practitioners of radical positivism exemplify the reductionist, statistical approach that is crippling scientific thinking and economic policy today.



Hermann Günther Grassmann
(1809-1877)



Rudolf Clausius
(1822-1888)

4. Hence, the intrinsic folly in method which underlies the habitual failures of the prevalent types of economic statistical forecasters.

Carl Woese and His Work

Dr. Carl Woese, microbiologist at the University of Illinois, is best known as the discoverer of the Archaea (ca. 1978), a type of organism including methanogens and other extremophiles, which, he saw, were not bacteria. Woese's discovery was at first bitterly opposed by such leading figures in biology as Salvador Luria and Ernst Mayr.

Woese pioneered the classification of organisms by biochemical signatures of the DNA, attempting to supersede the old classifications based largely on visual morphologies. Yet, his writings since 1965 show him to be a consistent opponent of the reductionism of molecular biology.

In 1990, Woese proposed a new taxonomy. By then, the kingdoms had grown to five: Plant, Animal, Protists, Monera, and Archaea. It was an inconsistent mixing of the earlier taxonomies, based on visual and microscopic morphologies, with the biochemical and electron microscopy. Woese proposed, as a remedy, to create three Domains, taxonomically above the Kingdoms. These

are Procarya (including bacteria), Archaea, and Eucarya. The first includes the bacteria, the second the very different Archaea, and the third the plants, animals and fungi, which share common traits and presumed lineage at the biochemical level.

Woese went on to develop his ideas of evolution of organisms, not from a unique common ancestor, but rather by a process he called horizontal gene transfer occurring in a communal living process that had little or no species individuation. The excerpt from the 2006 paper below summarizes that notion. —*Laurence Hecht*

Excerpts from Woese, et al. on Collective Evolution*

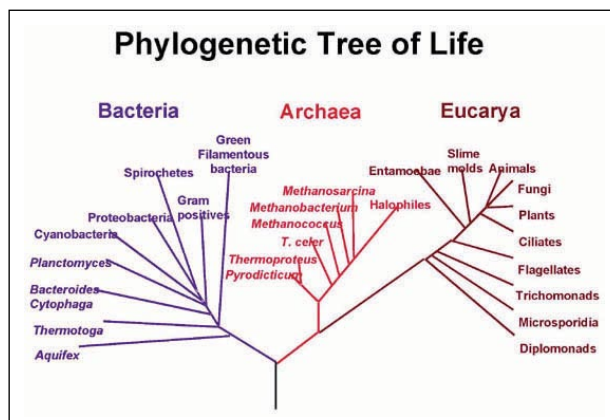
The genetic code could well be optimized to a greater extent than anything else in biology and yet is generally regarded as the biological element least capable of evolving. There would seem to be four reasons for this paradoxical situation, all of which reflect the reductionist molecular perspective that so shaped biological thought throughout the 20th century.

First, the basic explanation of gene expression appears to



Bill Weigand/UIUC

Microbiologist Carl Woese



NASA

Woese proposed three Domains, taxonomically above the Kingdoms: Procarya (which includes the bacteria), Archaea, and Eucarya.

lie in its evolution, and not primarily in the specific structural or stereochemical considerations that are sufficient to account for gene replication.

Second, the problem's motto, genetic code, is a misnomer that makes the codon table the defining issue of gene expression.

A satisfactory level of understanding of the gene should provide unifying account of replication and expression as two sides of the same coin. The genetic code is merely the linkage between these two facets. Thus, and thirdly, the assumption that the code and the decoding mechanism are separate problems, individually solvable, is a reductionist fallacy that serves to deny the fundamental biological nature of the problem. Finally, the evolutionary dynamic that gave rise to translation is undoubtedly non-Darwinian, to most an unthinkable notion that we now need to entertain seriously...

To this point in time, biologists have seen the universality of the code as either a

manifestation of the Doctrine of Common Descent or simply as a frozen accident...

Our point of view alleviates the need for any assumption of a unique common ancestor. We argue that the universality of the code is a generic consequence of early communal evolution mediated by HGT [horizontal gene transfer], and that HGT enhances optimality...

If Darwin had been a microbiologist, he surely would not have pictured a struggle for existence as red in tooth and claw. Our view of competition in a communal world as a dynamical process is very different from the widely understood notion of Darwinian evolution. Survival of the fittest literally implies that there can only be one winner from the forces of selection, whereas in a communal world, the entire distributed community benefits and its structure becomes modified by the forces of a selection that is an inherently biocomplex phenomenon involving the dynamics between the community elements and the interaction with the environment...

* Kalin Vetsigian, Carl Woese, and Nigel Goldenfeld, "Collective Evolution and the Genetic Code," *PNAS (Proceedings of the National Academy of Science)*, Vol. 103, No. 28 (July 11, 2006), pp. 10696-10701.

only in the relatively higher realm of the Noösphere. As I show in this report, it is those features of the Noösphere which are lacking in the Biosphere, which should be the preferred choice in defining the principles within which existence of the Biosphere *is situated ontologically*.

Therefore, I point to such examples of mistaken approaches, as are typified either by the denial of an efficient universal physical principle of life *per se*, as by radical positivists and their like, or, by the comparable attempt to adduce the origins of the cognitive powers specific to mankind from the biology of animal life.

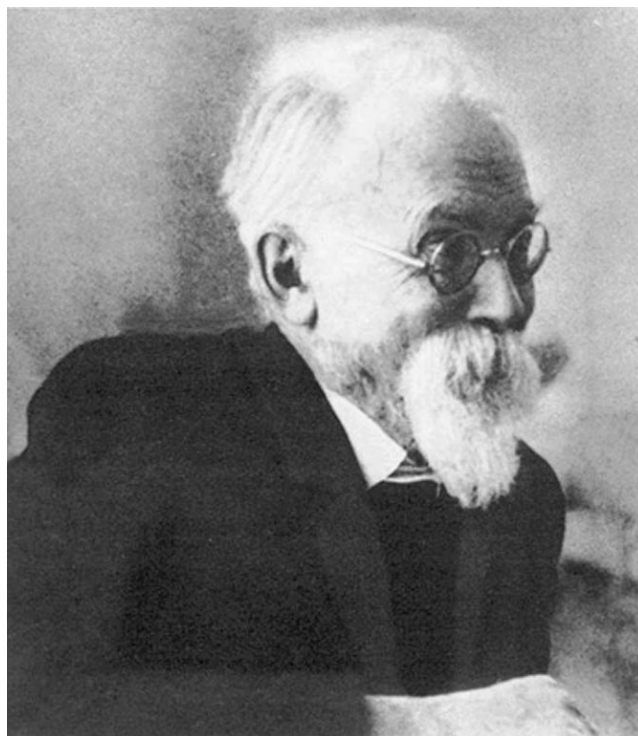
Today, those who have actually grasped the higher order of meaning which permeates the specifically human process of successful discovery, know that universe to be, in principle, as Leibniz argued for a universal physical principle of least action, and as Albert Einstein, similarly, recognized the universe to be: *a dynamic, analog form of Riemannian universe, not a neo-Cartesian statistical (digital) universe*. Contrary to the hoax of the famous “Second Law” of Clausius, Grassmann, Kelvin et al., ours is a universe which exists, for our powers of discovery, as a boundlessly finite universe, *a self-contained, anti-entropic, universal process of continuing creation*—as the famous aphorism of Heraclitus claimed.

This is the same point which was *exemplified, for us in modern European civilization, as Einstein emphasized the exemplary significance of Kepler’s uniquely original discovery of gravitation, by a succession of discoveries of universal principles which are, each and all, typified by Johannes Kepler’s uniquely original discoveries founding the science of modern astrophysics.*⁵

Therefore, the encompassing premise in my argument bearing on the referenced aspect of the work of Woese et al., is not only located within Academician V.I. Vernadsky’s uniquely original discovery of a universal physical principle known as the Biosphere, but also in Vernadsky’s associated recognition of the existence of the Noösphere as being, also, a strictly dynamic, distinct universal phase-space, which is also to be defined experimentally in Riemannian terms. In addressing matters of living processes, the emphasis is upon the precedents of physical chemistry treated by the Riemannian method adopted by Academician V.I. Vernadsky; as I have shown successfully for a science of physical economic forecasting, which are the same Riemannian principles, of the Noösphere.

It may appear to some that the Noösphere is a product of the Biosphere. True, the Biosphere loans material to the Noösphere, and vice versa; but, it is the Noösphere which contains, and acts upon the Biosphere. It is the Noösphere which transforms the Biosphere, not only in materials, but in what the Noösphere compels the Biosphere to contain, or to produce, by both de-

5. As I have pointed out in various earlier locations, the idea of science, such as the Egyptian-Pythagorean practice of *Sphaerics*, is derived from *that notion of universal* which, as a concept, has depended upon a very long span of empirical development of calendars derived from the cumulative evidence of very many generations of development of long-ranging celestial (oceanic) navigation by maritime cultures, as under the conditions of the approximately 200,000 years during which glaciation dominated large portions of the Northern Hemisphere, a glaciation toward which Earth is signaling a threat to return now.



Russian-Ukrainian scientist Vladimir I. Vernadsky (1863-1945) defined his conception of the Noösphere in Riemannian—not statistical—terms. Science must proceed from this standpoint downward to the subsumed subjects of the Biosphere and inanimate nature.

ductions and additions to the repertoire of the Biosphere’s substance and action.

Thus, my own contribution to that latter array, is to be found in my premising an actual science of physical economy, the standpoint which I have employed for the special case of long-range forecasting and related purposes, since the late 1950s, on those same implications of Bernhard Riemann’s argument which were first boldly stated in their core in his 1854 habilitation dissertation.⁶ My own views on the significance of Riemann’s work for physical economy, views which were outgrowths of a notion—a “spark”—discovered by me to this effect in 1953, have continued to be the foundation, since that time, for my original

6. The principal such distractions from this fact of Vernadsky’s originality are to be found in the kinds of misguided, “fundamentalist” or kindred religious fervor, notably those forms which adopt either the dubious speculations of the “Pilt-down” co-hoaxster and reductionist mystic Teilhard de Chardin, or, what are clearly recognizable elements of the ancient pagan’s Delphic cult of Gaea, in seeking to bring the mighty Creator of the universe down to Earth, so to speak. Teilhard’s relevant work touches, if only deceptively, upon the names of valid conceptions, that to such effect that the errors of many of his putatively more orthodox critics are worse mistakes than his own. It is in the systemic features of his applications of his conception of noësis, that the essential error of his explanations is more clearly shown. The source of the confusion lies in Teilhard’s attempt to reconcile the idea of creativity with what is called, unfortunately, a “Classical” Christian doctrine, where the attractive aspects of his work appear; his attempt to reconcile that with an axiomatically reductionist (i.e., Aristotelean or quasi-Aristotelean) form of cosmogony, is the root of his confusion. Teilhard’s minting of the term “Noösphere” was acknowledged by Vernadsky; Teilhard named the baby, but Vernadsky conceived and delivered it.



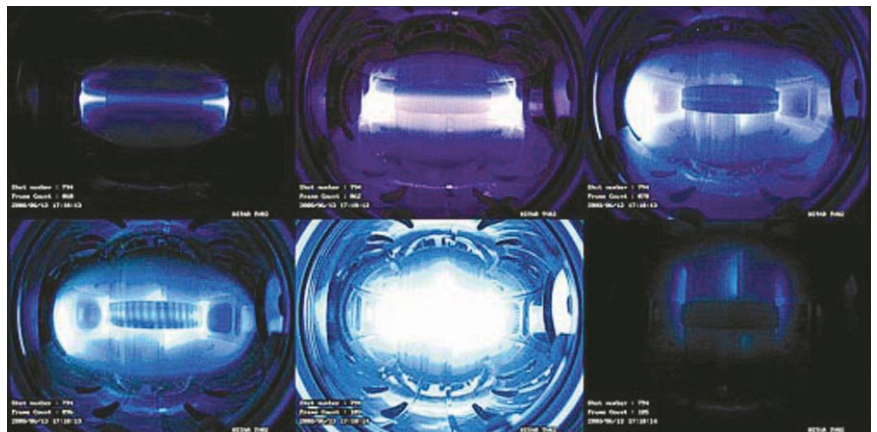
Michel Maccagnan/GNU

In a typically human willful act of seizing “fire” from the Olympian Zeus, South Korea’s KSTAR (Korean Superconducting Tokamak Advanced Research), intends to establish the scientific and technological basis for a future power-producing fusion reactor. KSTAR produced its first fusion plasma in July 2008, as seen below.

1950s development of a science of physical-economy, a branch of science which is in the continuing tradition of Leibniz’s emphasis on dynamics, as opposed to Cartesian and related methods. This is, thus, a continuation of work of founding of a physical science of economy, as accomplished by Gottfried Leibniz over the course of his relevant work during the span of 1671-1716. This method has been the basis for what has proven to be, uniquely, a, happily, virtually faultless series, of superior quality, of long-range economic forecasts, that since the late 1950s.

The crucial, and pivotal fact on which my own discovery in this matter depends, is expressed in a specifically dynamic manner (i.e., analog: Leibniz-Riemann), as distinct from wrongly assumed digital (e.g., Euclidian-Descartes) characteristics of human potential population-density, *as, thus, absolutely distinct in effect from the concept of ecological potential population-density expressed by lower forms of life*. The human individual is potentially, uniquely capable of re-inventing the human species in a qualitatively more advanced form of functioning, through transcendental, qualitative up-shifts of a Classical mode in the potential relative population-density of the human species.

Thus, the shifting dependencies of the ascending quality of



Courtesy of the Korea National Fusion Research Institute

economies, successively, from burning of wood, of coal, of petroleum, of nuclear-fission power, and upwards, typify characteristic, phase-space stages of successive, upward evolution of human cultures, a willfully driven, qualitative development of the species of action which does not occur in any merely ordinary living species. It is man’s seizing knowledge of that “fire” which Olympian Zeus forbade be given to mankind, which defines the human species in its true distinction from all lower forms of life.⁷

7. Aeschylus, *Prometheus Bound*, line 7, πάντεχνοῦ πυρὸς σελασ, which Herbert Weir Smyth translates: *flashing fire, source of all arts*.

In other words, the actual existence of the human species, with its characteristic form, as *dynamic*, is derived from a specific (i.e., *noëtic*) quality of the human mind, a quality which does not exist within any lower form of life (e.g., in the Biosphere). The principle of human life neither exists in lower forms of existence than that, nor can it be derived from studies of the non-human, as if “pre-human,” aspects of the Biosphere. The Biosphere generates the potential for effective action by the Noösphere; but, the realization of such potential occurs only within the Noösphere itself.

Focus upon the fact that the increase of the absolute magnitude of the proportions of the composition of the Earth’s mass represented by the combined Biosphere and Noösphere, as a percentile of the total mass of our planet, when this is considered in light of the evidence that the Noösphere is expanding more rapidly than the Biosphere as such, indicates the existence of a universal physical principle, the cognitive powers of the individual human being, which is not willfully expressed in any lower form of life than the human individual.

The included point here, as it is amplified in the subsequent chapter of this report, is that the principled character of the Biosphere’s function is itself transformed qualitatively by the action of the Noösphere, such that the Biosphere no longer has fixed sovereign characteristics, because those characteristics themselves are being continuously transformed by action of the Noösphere. This pertains not merely to the array of elements of which the Biosphere is composed, but to the principles which generate the selected elements, both old and newly created, of the Biosphere’s evolution under the reign of the Noösphere. The evolution of isotopes, their roles, and their relative quantities, as with those of specific importance for living processes, as through the role of nuclear-fission of late, could not occur otherwise.

That distinction, is what is to be called the function of *human potential relative population-density, as increased per-square centimeter of cross-section of mode of power employed, drives a (potential) per capita and per square kilometer increase of potential human occupation of a large territory (or, of a continent or of the planet as a whole)*. This fact is relatively obvious to even merely competent modern studies; but, the way in which this effect is generated, takes us outside the bounds of the way the topic of “scientific method” as such is usually visualized in today’s classroom and elsewhere. The crucial point to be emphasized, is: *the Noösphere is derived from a universal physical, cognitive principle of human life, a power of organization which does not exist within the species of the lower forms of life, such as the higher apes.*

The progress of the human species, relative to other species, lies in a principle which is characteristic of the human species, but not others. Therefore, rather than the “bottom upwards” habit of attempting to obtain the transition to a relatively higher *cardinal* state of a multi-phase-space process, such as attempted transition from abiotic to Biosphere, or Biosphere to Noösphere, we must *not* proceed in terms of the factors of the previously existing (lower) state; rather, **we must treat the “teleological” tran-**

sition as effected by action as if bestowed from the higher state upon the relatively lower one as Vernadsky emphasized the ordering of the relative mass of the abiotic, Biosphere, and Noösphere. In other words, *the form of increase of the potential relative population-density of the human population, has the (dynamic) mathematical-physical form of the pre-determination of the present potential by types of changes (as by human discovery of a higher principle) which correspond to what had been introduced as a future systemic level of potential, rather than something manifest as a statistical determination of a future state, as a consequence of a current one.*

The development of this potential in the human species, determines the effect of that upon the entire domain of the Biosphere. And, so forth, and so on.

I explain the significance of this phenomenon.

Carl Woese et al.

Therein lies the essence of my original discovery in the domain of a science of physical economy. However, my discovery is not merely that; there are much more profound implications of this, implications which should not be overlooked in an appropriate re-reading of relevant features in the identified work of Carl Woese et al.

It will be clear to those associated with the work of Carl Woese et al., that my choice of reference to their work in making the crucial point presented here, was prompted by my satisfaction with the dynamic implications of such passages in the referenced work as: “... Specifically, we will herein model the evolution of translation, the codon table, the constraints therein, the universality of the code, and the decoding mechanism, not as a sum of parts but as a whole. ...” In other words, *dynamics*, as defined by Leibniz against Descartes, and, defined later, by Riemann.

So far, so good; that is consistent with Riemannian dynamics. However, the question remains here: what is the organization of the whole process of development which accounts for the efficient, *actual* generation of *qualitatively* higher orders of dynamic states—higher states on principle, such as the fact that the human being represents a higher quality of principled physical state than any lower form of life?

The idea of the need to discover a solution for that question, is readily seen to be expressed in the upward evolution, as through realized application of higher physical principles, in physical-economic processes. The latter are, of course physical-economic processes, but those examples can not be other than crucially relevant for understanding other dynamic models of living processes, or the effects of human physical-economic evolution upon the two lower phases of our planet’s internal processes.

The answer, in the case of “social” models, as distinct from the organization of behavior in the animal kingdom (as with models such as mankind living within Kepler’s astrophysics), is that *the universe is intrinsically anti-entropic*, contrary to the Clausius, Grassmann, Kelvin cult of a “second law of thermo-



Remy/swiss-image.ch

Al Gore personifies the Malthusian, fascist political intent behind the "Global Warming" fraud. Its acceptance depends upon a population not using the higher cognitive functions that distinguish human from animal behavior.

dynamics." However, as Vernadsky's work has forced the fundamentally principled distinctions among the abiotic, the Biosphere, and the Noösphere to our attention, there are qualitative distinctions of universal principle among those sectors of the universe to be taken into account. As the history of the changes in relative mass of abiotic, Biosphere, and Noösphere components of the upper regions of Earth show, entropy, as a phenomenon, is a subsumed expression of the superior influence, anti-entropy, within which the apparent entropy appears, and under which it must be defined. *Before there could be death, there must, first, be life.*

The conclusive argument to such effect, is located in the case of mankind's increase of the potential relative population-density of human populations, which is accomplished only through those noëtic processes of discovery of higher order physical and kindred, Classical artistic, principles, processes which echo the process of creation typified by Johannes Kepler's uniquely origi-

nal discovery of the role of gravitation in the ordering within the Solar System.

The human being is distinguished from any animal species by the set of relationships defined as a reflection of its twofold characteristic. On the one hand, it has a body, like that of an animal; at the same time it is an absolutely different form of existence than any of the great apes, which are mammals, by the existence of a human mind which is not located within the confines of the apparent mental life of an animal. This distinguishing difference is conveniently identified as the human "spirit" or "soul," which has none of the characteristics of any known form of animal life, except as animals develop as appendages of mankind.⁸

Yet, a naive use of the term "spirit" or "soul" not only misses the crucial point, but has promoted widespread, absurdly mystical speculations. The human "soul" is very much an efficient part of the physical universe, that in the sense of the famous **Genesis 1**, but not as the term "physical" is still customarily employed in reductionist terms of reference. That "soul" is the actual personality of the human individual, that in the sense provided by Plato. It is an expression of an efficient phase-space within the universe at large, and expresses, in the guise of the Noösphere, a human individual's power to change that universe willfully.

The biological domain, the domain of the Biosphere, is contained within, and is subordinate to that Noösphere. This is to be understood as the expression of the Noösphere's power to contain and modify the characteristics of the Biosphere. With mankind's appearance, the Biosphere thus loses its independent functional characteristics (if, indeed, it ever had them); the Biosphere becomes, in every way, a phase-space contained within the Noösphere.

Therefore, we treat the subject of the Biosphere here in those terms of reference. We present the case to be argued here by the method of successive conceptual approximations.

That, so described thus far, is my subject here.

1. The Relevant Fallacy of Sense-Certainty

The crucially distinct feature of human behavior is, that, unlike animal behavior, human behavior is inherently *not* subject to the conceptual approach inhering in presently conventional ranges of today's proffered statistical-ecological models. Nor is animal behavior ordered in a way which is independent of the effect of changes in the higher, human, reign of the Noösphere. It is also fair to say that "choices" of animal behavior are, relatively speaking, "event-driven," where the crucially important, higher cognitive functions of actually intelligent, as distinct from "knee-jerk" practices among human beings, are concept-driven,

⁸. I address this, and Cusa's treatment of the same subject, within part of chapter 2 of this report.

rather than “event-driven.”⁹

Therefore, the way to design the lure for an animal, or a foolish U.S. voter, to bring about that individual’s contribution to its self-inflicted ruin, is to rely on the intended victim’s behavior being “event-driven” (e.g., “fact-driven”) as, for example, the pathetic credulities of believers in “Malthusian” models, such as the “Global Warming” hoax. Otherwise, what is typical of intelligent human behavior, especially creative-scientific or Classical-artistic behavior, is “teleologically”-driven human creative insight, in the sense of a Classical (e.g., Platonic) form of *hypothesis*.

To the extent that human populations may, at some time, seem to show relatively fixed (e.g., “traditional”) ecological potentials, apparently like those which might be attributed to be characteristic of animal populations, such as knee-jerk proposals for the fraudulent, Malthusian policies of former Vice-President Al Gore, et al.: such decadence by the Malthusians and their present-day “Global Warming” frauds, is itself evidence that the related cultural matrix of that inherently stagnating society which such frauds as Gore’s express, is inherently an abnormal (i.e., pathological) model, one specific to that half-witted trend within the relevant part of the general population.¹⁰ Whereas, a healthy organization of society is not a fixed system, but upward-evolutionary (e.g., increasing potential relative population-density), and, thus, committed to scientific, Classical-cultural, and technological progress for its own sake.

Thus, speaking parenthetically, since, as I have already emphasized here, the Biosphere is bounded systemically by the Noösphere, the crafting of the environment through the evolution of the Noösphere, shapes the selected course of regulating both the external boundaries and internal development of the Biosphere (defines the changes in rules). This functions to the effect that the dynamic “forces of evolution” within the Biosphere, are not independent of the Noösphere; but, are themselves shaped by the development in the Noösphere.¹¹ Thus, it is essentially an error to attempt to develop a simply biological model for the Biosphere as such, even a truly dynamic one: thus making the error of assuming that the higher, controlling force of the Noösphere were not the increasingly significant source of



Painting by Heinrich Fueger, 1817

Prometheus bringing fire—the knowledge of universal physical principles—to mankind, a “crime” for which he was punished by the Olympian Zeus

the conditions to which the evolutionary (Riemannian) dynamic of the physical geometry of the Biosphere is subject.

For example, consider some relevant history:

The Decadent Olympian Model

In the history of the ancient through modern cultures gathered around the Mediterranean Sea, the culture of typical cases of stagnating, or degenerating societies, is typified by the model depicted by the “zero growth” policy expressed by the character of the Olympian Zeus, of Aeschylus’ **Prometheus Bound**. Under Zeus’ inhuman, tyrannical policy of zero-technological growth, the ordinary people, like the helots of Lycurgus’ Sparta, or the neo-Malthusian dupes of the U.S.A. and Europe since 1968, are forbidden access, if only ideologically, to the possibility of the gaining of knowledge of universal physical principles (e.g., “fire,” nuclear-fission power, etc.). The effects of an implicitly neo-Malthusian cultural pathology of those who can be defined ideologically as “68ers” and their dupes of younger generations, are typified by the archetypical case of Aeschylus’ account of the evil of the Olympian Zeus, an Olympus which is a model case

9. Concept-driven” as in recognition of a relevant principle of nature, or of current social processes. Thinking which walks in the footsteps of the discovery of universal gravitation by Kepler, Fermat’s discovery of the principle of least action, Leibniz’s uniquely original (e.g., 1676) discovery of the principle of the calculus, or Riemann’s 1854 habilitation dissertation.

10. It is fair, and necessary to say that former Vice-President Al Gore’s “global warming” hoax, is essentially a fascist economic model in the footsteps of the Haileybury Society’s Thomas Malthus, Mussolini, and Hitler, or, the Olympian Zeus of Aeschylus’ *Prometheus Bound*, or Friedrich Nietzsche’s dogma, since the model could not be institutionalized as a national, or world system except by what are easily recognized as fascist political means. Thus, essentially, like the H.G. Wells who stated his fascist commitments openly, Wells’ accomplice, Bertrand Russell, was even more frankly, rabidly fascist than a Mussolini or Hitler.

11. Compare the case of the displacement of marsupials by arriving mammals, as the Australian “historical” model attests. While kangaroos, for example, may persist, most of the marsupials are replaced, niche by niche, by placental types which caricature the marsupial types. Leaving such oddities as the Platypus and a certain well-known, large-pouched publisher lingering as leftovers from the set of egg-laying species.

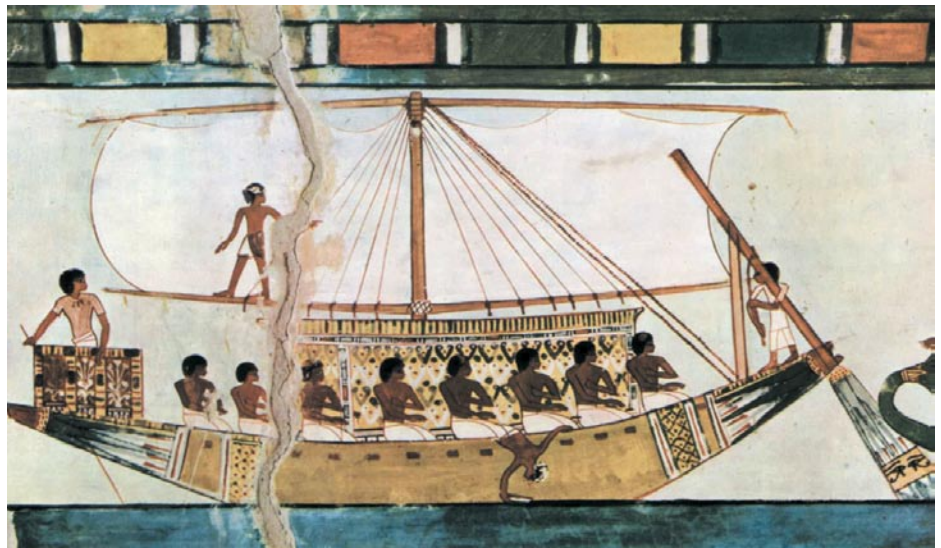
which becomes, thus, key for understanding both the characteristic systemic-cultural problems and the origins of these problems which have been the continuing threats to civilization from within modern trans-Atlantic culture itself.

For example, in the so-called “code” of the Emperor Diocletian, who crafted the political system from which the Byzantine Empire emerged, the rich and powerful lusted and reveled, while the mass of the thus degraded population knelt, and accepted a quasi-“Malthusian” social system of what was virtually “zero technological growth.” This set the pattern for serfdom, or worse, as a system. This affected the development of the organized behavior of that society as a system. That, in turn, generated an effect, which, in turn, made the factually obvious, implicit rules for dynamic “channeling” of the *self-evolution* of the Biosphere in that phase of the planet’s life.

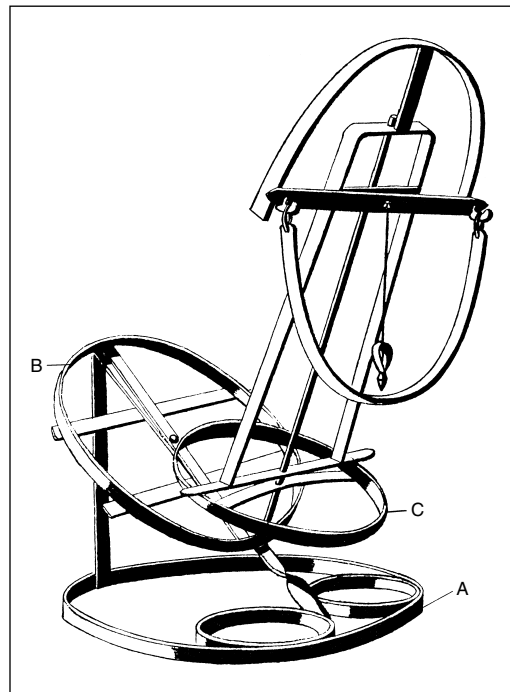
This model of Diocletian and his successors, was a variant of the Delphic model of Lycurgus’ Sparta. It had been, and remained a variant of what was known as the “oligarchical model,” a Delphic model which had been temporarily defeated by Alexander the Great, but was to be established, under the hegemony of the murdered Alexander’s Ptolemaic successors, up into what was to emerge later as the rise of the process leading into the process of formation of what was on the way to becoming the Roman Empire from about 200 B.C.,¹² and would be continued, in principle, in Europe and adjoining regions of west Asia under the Byzantine system, and under the still worse, successor system under the hegemony of the Venetian financier-oligarchy and its instrument the Crusading Norman chivalry.¹³

12. The deaths of the celebrated correspondents Eratosthenes and Archimedes, marked the onset of a clearly marked decline in European culture in the period beginning the Roman victory in the Second Punic War.

13. It is notably relevant, that the ancient Greek model of later European imperialist designs, is to be seen, to modern times, at the existing site of the Delphic cult of Apollo-Dionysos. Arrayed around the site of the temple itself, there are “chapels” representing the treasuries of ancient Grecian cities. Following the path downhill to the relevant nearby port location, we recognize the ancient Delphic model for not only the Lombard League of European “New Dark Age” notoriety, but the presently posed renewal of a proposed world empire of city-state usury proposed by those who, today, demand the form of globalization proposed by such creatures as that self-proclaimed, Forty-Billion-Dollar fossil, New York Mayor Bloomberg.



An Egyptian ship depicted in the Tomb of Menna, ca. 1422-1411 B.C.) Actual science developed out of the practice of ancient celestial navigation.



Drawing by Matt Makowski in *The Epigraphic Society Occasional Publications*, Vol. 32, No. 29, Feb. 1975

Sketch of a brass model of an ancient tanawa, or calculator, made from a drawing on a cave wall in Sosorra, Irian Jaya (West New Guinea), around the year 232 B.C. The base (A) in the plane of the observer’s horizon, is oriented so that the axis of symmetry is parallel to the meridian. (B) is the equatorial plane. (C) is the ecliptic plane. The Renaissance tanawa was known as a torquetum.

The principal exception to that oppression, is to be seen during the reign of Charlemagne; the death of Charlemagne opened the way for the hegemony of the system of domination by (temporarily) a decadent Byzantium, and, then, later, the imperial Venetian financier-oligarchy with its chronically crusading Norman instruments.

Looking more deeply into these chronic problems of the presently continuing European form of the oligarchical model, the pro-oligarchical model of most of the reigning local governments centered on the Mediterranean, most of the time, we have the following notable points of relevant emphasis bearing on the

external conditions affecting the evolution of the human parameters of the Biosphere itself.

Celestial Navigation

What became known as European culture was rooted in a widespread maritime culture dated from deep within the last great age of glaciation, so far, in the Northern Hemisphere. The leading cultures emerging in the historical Mediterranean from that time, were maritime cultures, cultures whose more or less remote ancestors had (apparently seasonally) migrated across very long distances, and did so continuously over many thousands of years. The practice of navigating by study of the differentiated pattern shown by the Sun, Moon, Planets and Stars, sailing by the stars, has been the obvious root of the proper use of the term "universal," the only valid meaning of "science," especially as this term is to be applied to physical science, especially as this was defined for modern times by the manifold role of Cardinal Nicholas of Cusa in launching the modern history of European civilization with the Fifteenth-Century Renaissance, and with the prompting by Cusa's testament, of Christopher Columbus's famous first trans-Atlantic voyage of discovery.¹⁴

14. It was Nicholas of Cusa's proposal for trans-oceanic development of contacts of Europe across the Atlantic and into the Indian Oceans, which explicitly guided Christopher Columbus's scientific knowledge of the feasibility of crossing the Atlantic. Columbus acquired this knowledge through a reading of the testament of Cusa, which was lodged with the executor of Cusa's testament resident in Portugal at that time. Approximately two decades later, Columbus succeeded in fulfilling that intended design by Cusa.

Much of the experience from that long period of glaciation and the earlier portions of its aftermath, remains to be defined. Yet, it remains increasingly clear, that the great floods and ancient rivers flowing from the melting of the glaciation correspond to a period, since about 17,000 B.C., since which the levels of the oceans had risen, by about 2000 B.C., by about 400 feet. However, what is clear about the outcome of this change, is the still visible evidence, today, of the role of oceanic maritime cultures in colonizing areas often fortified against the populations of the nearby interior. To be brief, here, this led into a period, during the Seventh Century B.C., when the Etruscans, Ionians, and Egypt (e.g., Cyrenaica) became allies against the tyranny of Tyre. This development, based chiefly on a renaissance in Egypt of that time, defined the process of synthesis which formed the root of European maritime culture, and the subsequent development of European civilization.

The crucially relevant point on which I am focussed in these references to such historical matters here, is that it was the trans-oceanic maritime cultures, the cultures reflected in the great discoveries of Johannes Kepler, which had discovered the secrets of celestial navigation; but, these cultures had tended to degenerate into a form of oligarchical rule over the strains of human population from inland regions.

There were, in fact, two principal strains of oligarchical culture affecting the Mediterranean from historical times. One, emphatically land-based, and principally a reflection of emerging cultures of the Asian interior, and the other, the Mediterranean-

Einstein on Kepler

These are excerpts from an essay by Albert Einstein, in commemoration of the 300th anniversary of Kepler's death. It appeared in the Frankfurter Zeitung on Nov. 9, 1930.

In anxious and uncertain times like ours, when it is difficult to find pleasure in humanity and the course of human affairs, it is particularly consoling to think of the serene greatness of a Kepler. Kepler lived in an age in which the reign of law in nature was by no means an accepted certainty. How great must his faith in a uniform law have been, to have given him the strength to devote ten years of hard and patient work to the empirical investigation of the movement of the planets and the mathematical laws of that movement, entirely on his own, supported by no one and understood by very few! . . .

One can never see where a planet really is at any given moment, but only in what direction it can be seen just then from the Earth, which is itself moving in an unknown manner around the Sun. The difficulties thus seemed practically unsurmountable.

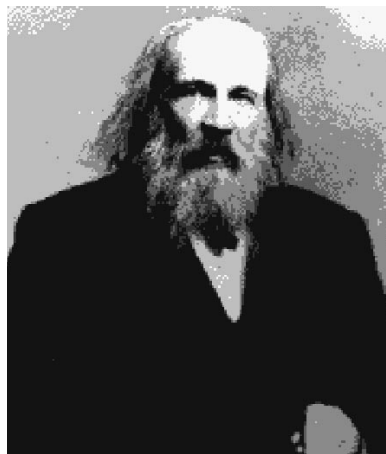
Kepler had to discover a way of bringing order into this chaos.



Max Planck (left) gives a medal to Albert Einstein in Berlin, June 28,



Louis Pasteur
(1822-1895)



Dmitri Mendeleev
(1834-1907)

The principled physical distinctions among the distinct phase-spaces of the abiotic, Biosphere, and Noösphere “are to be located systemically (experimentally) in their common domain, that of the practice of physical chemistry in the footsteps of those such as Louis Pasteur, D.I. Mendeleev, William Draper Harkins, and Vernadsky.”



William Draper Harkins
(1873-1951)

centered maritime culture. During the interval following the Peloponnesian War, during the adolescent and adult life of Alexander the Great, the two systems of oligarchical rule, the Mediterranean and Asian, were fused to form what has been the generic form of the European cultural oligarchical model of medieval and modern times, that typified by the financier-oligarchical rule of the British Empire of today.

Thus, with the late Sixteenth, and Seventeenth-Century triumph of the new Venice faction of Paolo Sarpi and his followers over the pro-Aristotelean old-Venice faction, the defeat of the continental European powers in the wars of France’s Louis XIV, through the February 1763 Peace of Paris, brought about the emergence of the Anglo-Dutch Liberal faction of Paolo Sarpi’s heritage, as the hegemonic, oligarchical form of imperial maritime culture, chiefly Anglo-Dutch Liberal financier-imperialism, of Europe and most of the world beyond, during most of the time since that point. The emergence of the U.S. Federal republic as seen in admiration for U.S. President Franklin D. Roosevelt, from among many nations, is what is to be seen as having been

the principal design for a successful challenge to Anglo-Dutch global imperialism since that time, to the present date.

The Ontological Infinitesimal

For the subject of this present report, which is essentially a matter of physical science, more than politics otherwise, the relevant pro-Classical argument can be fruitfully selected and adopted from the treatment of that kind of distinction between “naturally” and socially generated catastrophes, as proffered by Plato in his *Timaeus*. For the purpose of this present discussion, I focus attention on the effect of catastrophes induced by a failure of a society to progress in ways which, at the least, overcome the attrition inherent in any, scientifically, “zero technological growth” system, that through the qualitative

advances in the scientific-technological practice on which the society’s resistance to decadence always depends.

Since the developments typified in the content of the revolutionary work of Vernadsky and Einstein through, approximately, the time of their deaths during, and in the aftermath of several years during and following the 1939-1945 “World War,”¹⁵ we are properly obliged to recognize the subject-matter of “physical universe” as being represented by three distinct, but nonetheless inseparable qualities of phase-spaces: 1.) The “ordinary” abiotic, 2.) The Biosphere, and 3.) The Noösphere. Following the line of work by Academician V.I. Vernadsky, the principled physical distinctions among these phase-spaces are to be located systemically (experimentally) in their common domain, that of the practice of physical chemistry in the footsteps of those such as Louis Pasteur, D.I. Mendeleev, William Draper Harkins, and Vernadsky.¹⁶ However, the three identified phase-spaces are also interacting, and evolving *dynamically* as a set: the one shaping the conditions which shape the evolving existence of the other.

The method by which these phase-spaces are to be distinguished, is, essentially, that method of modern European science which is subsumed by the legacies of Nicholas of Cusa and Johannes Kepler. In this method, the notion of the existence of universal physical principles as defined by the common features of the method of Cusa, Johannes Kepler, Fermat, Leibniz, Riemann, et al., is only conditional, but nonetheless crucial. That distinction which I have defined in sundry locations as the principle of the *ontologically infinitesimal* character of the infinitesimal of the Leibniz calculus,¹⁷ provides a model definition of all

15. Vernadsky died in January 1945, Einstein in April 1955.

16. And also, implicitly, in that work of Max Planck which was so viciously attacked by the German and Austrian followers of the radical reductionist Ernst Mach, during the period of the 1914-1917 warfare.

17. In defiance of the common, empiricist Sophistry of de Moivre, D’Alembert, Leonhard Euler, Joseph Lagrange, Laplace, Cauchy, Clausius, Grassmann, et al.

true universal physical principles, principles such as Kepler's uniquely original discovery of universal gravitation, and Albert Einstein's related emphasis on an unbounded, but finite universe of universal physical principles.

All valid universal principles are expressed in detail, as Kepler defined the principle of gravitation, in the form of their characteristic experimental expression as "ontologically infinitesimal."

The appearance of this discovery of what became known later as Leibniz's principle of the "ontologically infinitesimal," by Cusa, also marks the moment of birth of modern science as modern science, including the science which must be employed to define the principles of the subsumed Biosphere and abiotic domains.

That discovery, as presented by Cusa, marks the rebirth of the same principle implicit in the work of the Pythagoreans and Plato. Cusa, recognizing a systemic error in Archimedes' quadrature of the circle and parabola,¹⁸ first presented the principle of the *comma*, from ancient *Sphaerics*, into the practice of modern European civilization. This notion by Cusa was the foundation of competent development of modern science, as from the discovery of the principle of gravitation by Kepler, the notion of a principle of least action associated with a discovery by Fermat, and the first development of a calculus, by Leibniz, based on the no-

tion of the *ontologically infinitesimal* expression of universal physical principles, as those are rightly premised on the previously stated principle of Kepler for this purpose.

Briefly consider the crucial historical implications of the immediately foregoing statements.

For example: the essential experimental basis for Einstein's celebrated insistence that the universe as a whole is *conceptually finite*, has ancient roots traced implicitly to times prior to the practice of *Sphaerics* by the Pythagoreans:

Sphaerics, as a legacy of very ancient practice of celestial navigation, as with the maritime cultures existing under the conditions of widespread glaciation, toward which the planet is threatened, again, over the long haul ahead, is obviously the relic of seasonal and otherwise repeated celestial navigation over distances as long as thousands of miles; only under those conditions could mankind have discovered the qualitative changes, as distinct from, and opposed to the conception of apparent simple (cyclical) repetition, a discovery which were necessary for the discovery of a reigning principle of qualitative, progressive change in the composition of the navigator's and calendar-builder's celestial array.¹⁹ Astrophysics was, necessari-

18. I.e., Cusa's exposure of the systemic error in Archimedes' quadrature of the circle.

19. Compare Philo of Alexandria's denunciation of the theology of Aristotle's method, and the echo of Philo's denunciation of Aristotle for astrophysics by Kepler. Note, as most notable, Kepler's exposure of the specifically Aristotelean fraud central to Claudius Ptolemy's fixed system.

Kepler on Aristotle's Sabotage of Astronomy

Johannes Kepler (1571-1630) refuted Aristotle's geocentric cosmology, and charged that Aristotle held science back for nearly two millennia, until the advent of Copernicus, by rejecting the Pythagorean idea that the Earth moves in an orbit around the Sun ("the fire"). Kepler's full document was published in 21st Century, Winter 2001-2002, in a translation by George Gregory. These are excerpts.

[The Pythagoreans] spoke in a veiled way; by fire they understood the Sun, and I agree with them, that the Sun is in the center of the world, and never moves away from this place, and that, on the other hand, the Earth moves once in one year around the Sun, that is, it revolves around the center position of the world, as otherwise also five other wandering stars [that is, the planets]...

[Aristarchus of Samos (310-ca. 230 B.C.) was accused of blasphemy and threatened with death for endorsing a



Johannes Kepler, the founder of universal modern physical science.

heliocentric system.] On account of this fear, and on account of the reputation of Aristotle, who rejected this teaching (although he did not yet fully understand it), this teaching was suppressed, and particularly because it was difficult to understand, it was nearly forgotten for 1,800 years...

I am as little satisfied with Aristotle, when he thinks it is sufficient to have asked why the Earth remains at the center of the world, and to answer, that nature assigned this position to it. For it is entirely uncertain, and not conceded by me, that the Earth is in the middle of the world; and were it so, it would be so indeed on account of nature, but in the same way that all things are on account of nature. But one is not satisfied to know that things are according to

nature, but one asks why they are that way and not some other way, and what means nature used to bring this about...

ly, the beginning of actually scientific knowledge—of the notion of the actually universal, and, thus, of the *Sphaerics* which the Pythagoreans and others adopted from Egypt-Cyrenaica. That typifies the deep roots of humanity's acquisition of *that quality of universal knowledge which is the only practice worthy of the name of science.*

Since the ancient Classical Greeks, as these are typified efficiently by the Pythagoreans and Plato, the modern European standard for the definition of science was set by Nicholas of Cusa, that done in a series of his works typified by his *De Docta Ignorantia*. A competent form of universal modern science was established by the crucial discoveries of principle developed by Cusa's avowed follower Johannes Kepler. As Einstein emphasized on this same account, modern physical science in its full span, is lodged under the developed form of the work of Bernhard Riemann, but is rooted as a body of physical-scientific practice in the achievements of Kepler. It is with the argument by Einstein, that the concept of physical science was returned, full cycle, to that development of astronomy by ancient celestial navigators, as Bal Gangadhar Tilak emphasized in his review of a relevant selection of combined ancient and modern sources.²⁰

The distinction to be made is between the naive view of science as a fallacy of composition in design of merely repeatable experiments, as in the hoax of Clausius, Grassmann, et al., and science as a discovery of patterns of progressive (i.e., *anti-entropic*, rather than merely cyclical) change of the conditions of experiment under the impact of the discovery of relevant, long-ranging, universal physical principles.

The latter view is forced upon competent observers today, by the way in which relative potential population-density of the human species has been shaped, uniquely, for the human species: by the effects of willful progress of human practice to higher states of potential relative population-density, that through discovery and adoption of those higher principles of change which Aeschylus' Olympian Zeus forbade. *As I have already emphasized here, this development within the Noösphere reshapes the physical geometry of that Biosphere in ways which are to be seen as the effects of the changes which are effected in, and radiated from the higher realm of the Noösphere.*²¹

In the span of the known history of the known cultures centered on the Mediterranean, the kind of society which that Olympian Zeus's policy prescribed, is known to scholars as "the oligarchical model," under whose reign most people are reduced to the likeness of cattle by imposition of rules of no-change ("zero growth") which are reflected, typically, in Malthusian fads, and fascist political systems today. This oligarchical model has been the persisting origin of the degenerative

20. *I.e., Orion, or Researches into the Antiquity of the Vedas* (1893) and *Arctic Home in the Vedas* (1903).

21. Consider the impact of what are largely "transuranic" isotopes of specifically biological significance, a present line of development which echoes Vernadsky's impact on Russian geological science since the visit of Prince and later Czar Peter the Great to the site of the Freiberg academy (near Dresden).

crises, such as the present one, which mankind has experienced in known history.

Riemann & the Principle of Hypothesis

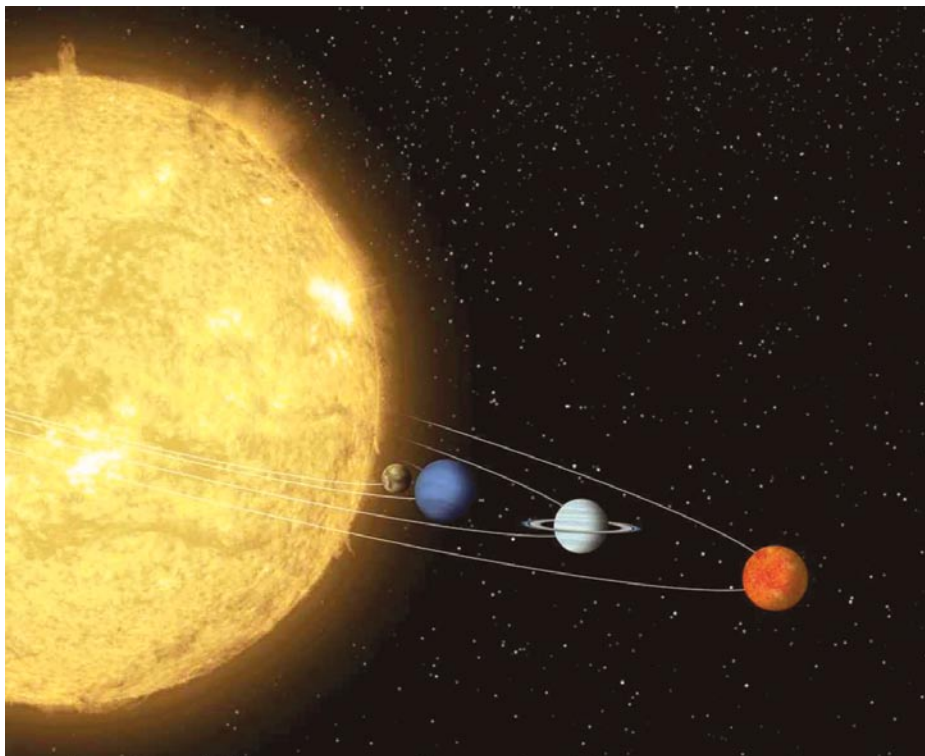
Thus, the implication of the revolutionary advance in physical science introduced by Bernhard Riemann, as first introduced in his 1854 habilitation dissertation, has led to the recognition that we must consider our universe as finite, that in the specific sense of being "finite but unbounded"—"self-bounded." This quality of finiteness, is expressed by mankind's expanding knowledge of sets of discovered universal physical principles, as each such principle is to be defined by the model of Kepler's discovery of gravitation.

A true universal principle is never itself an object of the senses, but is a principle which is shown, experimentally, as Kepler proved the case of gravitation in his *The New Astronomy* and the *Harmonies*, combined, as underlying (i.e., confining) the physical geometry of the relevant universal class of actions.

For that reason, the universe is known to be finite in the sense that any such universal physical principle is self-bounded (and therefore not externally bounded) as to relative magnitude "1," and that its local expression, as an efficiently acting universal physical principle, is therefore that of an ontologically infinitesimal quality of that action upon its subjects, as the work of Kepler's *Harmonies* shows. Thus, we have, contrary to the empiricists and positivists, Leibniz's derivation of the ontologically infinitesimal calculus from Kepler's discovery of universal gravitation.²²

Thus, since the time since the immediate post-World War II period, since the deaths of Vernadsky and Albert Einstein, evidence from the domains of physical chemistry has defined three clearly defined domains: First, and lowest, the abiotic domain; second, the Biosphere; and third, the subsuming power of the Noösphere. These domains are familiar to us by comparing the known patterns of growth of the latter two domains, the Biosphere and Noösphere, relative to the portion of the Earth's crust which is apparently not a product of physical-chemical changes done by living processes. Generally, the Biosphere and its residues are growing, in ratio to the mass of the crust, and the mass

22. As in the authentic discovery of a quantum principle by Max Planck (the adversary of the Machian positivist ideologues) later, Kepler's discovery of the organization of the system of gravitation of the Solar System, depended upon rejecting a purely visual (sense-perceptual) notion of the organization of the Solar System, by making the ontologically paradoxical juxtaposition of the notion of visual and aural sense-perception ("sight" and "sound"). There is no "empty space" in the organization of nature in the very small or very large. The hysteria exhibited, in defense of a childish blind faith in sense-certainty, by what were otherwise leading scientists, on the subject of the indispensable role of harmonics in defining universal gravitation, has continued to be a crucial, leading barrier to the progress in physical science today. The wild attack on Max Planck by the German and Austro-Hungarian dupes of Ernst Mach and Bertrand Russell, during and following World War I, should be compared with the common, and usually wildly lying hysteria against Kepler on the same account of "sense-certainty." In both cases, Kepler and Planck, the crucial issue is ontological: the refusal of the opponents to realize that the human sense-readings are merely the reactions of instruments which present us what are, so to speak, the mere shadows of reality: this to such effect that the paradoxical evidence of sight and sound, rather than the evidence of one alone, must be treated as, for example, Kepler did in defining the harmonics of gravitation itself, and Planck in his great discovery.



Artist's concept of the Solar System, NASA/JPL

At some point in human history, man discovered astrophysics, and recognized that “the starry skies above did not represent a simple system of repetitive cycles, but expressed the existence of a universe in endless qualitative development, from relatively simpler to more complex, higher order (anti-entropic development of) systems of the universe as a whole.”

of the Noösphere (human activity and its specific products) relative to the Biosphere.

Vernadsky rooted these distinctions in methods of a Riemannian practice of physical chemistry. Those methods, with their suitable enrichment, should be considered the implied authority to which I refer in this report.²³

The distinctions include the specifications, that: 1.) Without the principle of life, there is no development of the Biosphere within the Earth as a whole; 2.) Without human cognitive activity, there is no further development of the Noösphere within the Biosphere. From the standpoint of physical chemistry, those distinctions signify the notion of man and woman as made in the likeness of the Creator, relative to the Biosphere.

Hence, the “teleological” feature of the universe so defined. Without a universal principle of life, there is no biology; without a universal principle of human creative reason, lacking in all lower forms of life, there is no Noösphere. Thus, the abiotic Solar System (and beyond) is necessary for the expression of life, and living creatures are a necessary precondition for expression of the distinctive quality of human life; but, the principle of the Noösphere subsumes all. We must think of these principles as universal physical principles in the same sense as Kepler’s

23. The argument, by Vernadsky, to which I referred in my “Vernadsky & Dirichlet’s Principle,” *op. cit.*

uniquely original discovery of universal gravitation, but as of the quality of a different such universal principle. All three principles, including gravitation, share the character of being immortal as *principles*.

‘Sense-Uncertainty’

The root of the functional quality of mental disease called reductionism, is the notion of “sense-certainty”: that is to say, the notion that we are obliged to accept certain fancifully false notions of space, matter, and time, such as definitions, axioms, and postulates, without further investigation, this on the premise that this represents acceptance, *a priori*, of the stubbornly persisting evidence of our sense-perceptual apparatus as such. This systematic error is met in ancient through modern European traditions as the basis for that variety of Sophist method associated, successively, with the doctrine of Aristotle, as this variety of Sophism is echoed by the followers of Aristotle in the celebrated *Euclid’s Elements*.²⁴

We do not know the actual time and place of the crucial breaking-point in mankind’s experience, at which actual science displaced the pathetic worship of “sense-certainty.” We do yet know that what is to be rightly seen as the history of science today, which can be identified as emerging in the time and place in the history of man’s discovery of astrophysics, whatever were exactly that time; it became, thus, apparent to ancient masters of celestial navigation who recognized that the starry skies above did not represent a simple system of repeti-

24. Essentially, the main body of content of the *Elements* is in the form of systemic reification of hypotheses and theorems which had been defined earlier by, notably, the circles of the Pythagoreans and Plato. As the relevant principle was most famously clarified by Archytas’ purely constructive demonstration of the duplication of the cube, Classical Greek physical science, as in the Egyptian-Pythagorean *Sphaerics* echoed in the work of Thales and Heraclitus. The characteristic of that Classical physical science of the Pythagoreans and Plato, was the same notion of underlying physical principles as expressed essentially by the experimental methods associated with the concept of the same ontologically infinitesimal represented by Kepler’s discovery of the harmonic, rather than naive visual-space-like basis for a measurable value of organization of the Solar System.

Our various specific sensory powers are of the quality of instrumentation of our experience, presenting our minds with what are the shadows which reality prompts as perceived sensations. The contrast of two opposing qualities of perception, such as vision and hearing, was indispensable for Kepler’s discovery of the quantifiable principle of gravitation. However, although this principle of anti-Euclidean geometry was already clear to such predecessors of Riemann as the great Eighteenth-Century mathematician Abraham Kästner (and, actually, if secretly, Carl Gauss), it was not until Bernhard Riemann’s explicit expulsion of all reductionist method from physical science, that the problem had been placed in clear focus for modern science.

tive cycles, but expressed the existence of a universe in endless qualitative development, from relatively simpler to more complex, higher-order (anti-entropic development of) systems of the universe as a whole. This fact has been made clear to those among us who actually think according to that realization of the implications of Bernhard Riemann's fundamental revolution in physical science, a realization which is best represented today by the fundamentals of the work of Academician V.I. Vernadsky and Albert Einstein. Thus, no longer can science be considered competent, if it proceeds on assumptions based on interpretation of experience of what is esteemed as being contained within the abiotic. Competent science always looks from the top of the evolution of the changes within the universe, to the lower qualities of its organization. Competent science today is premised on Einstein's conception of a Riemannian universe of Kepler and Kepler's precedents, proceeding always from the foundation of science found only in those cognitive powers of the individual human mind whose typical achievements are sampled in the Riemannian universe, as that has been defined in exemplary fashion by Vernadsky and Einstein.

The great curse of prevalent modern science dogma, is that it is essentially empiricist, or, in its far more degenerate expressions as either positivism, or, even worse, existentialism.

Thus, competent science today proceeds from the origin expressed by the specifically creative powers of the human individual mind. Science must define itself as our knowledge of the universe as the progress of man's power to control, and to develop his universe; this shows us what the universe demands of us, and what it will tolerate from us as the practice, expressed through man's power in and over that universe, as that power is increased in such expressed terms as systemic increase of the potential relative population-density of the human species.

2. Anti-Entropy: The Principle of Creation

Thus, the secret of our universe is, that only beasts, or bestialized human beings, such as, in the worst cases, Malthusians like former U.S. Vice-President Al Gore, fail to recognize that, among all living species, mankind, and only mankind, is creative by its true, willful nature. For the competent human individual, there is no law of "entropy" in this universe, but only the misleading appearances represented as effects of a cultivated habit of stupidity, or worse, among some unfortunate people, sometimes very many people. For that faulty habit, do not blame humanity indifferently; blame some relevant people, including those wretched Sophists, such as those of the legendary press which were responsible for the policy behind the minting of that **New York Times** style book which has ripped the true Pythagorean *comma* of human creativity from its pages.

The crucial theme here can be summed up in a single statement, thus: ***The universe, viewed, properly, top-down, is the***



Strelka (left) and Belka, Soviet dogs who orbited the Earth in 1960—the first animals to survive orbital flight. LaRouche agrees with Soviet space scientists of that time, that dogs are more intelligent than chimpanzees. But there's something essential here that Al Gore et al. fail to grasp.

habitat of the reign of the Noösphere!

Dogs, Apes, & Humans

Those who recall the U.S.A. vs. Soviet rivalry in "the space-race" of the 1950s and 1960s, may also recall a debate, whether dogs were more intelligent than chimpanzees (the Soviet policy). Frankly, dogs won that contest. The crucial fact of the matter, is that dogs have a better potential for *relevant* qualities of seemingly *human-like intelligence* than *adult* chimpanzees. (Any dog-lover also familiar with the traits of the adult chimpanzee, can be attracted to this fact.) To settle the issue, it were sufficient to consider a candid debate of this matter, between a trainer responsible for managing adult male chimpanzees, and the proud and insightful human companion of a pet dog.

Let us seem to cheat just a bit, but that only for a pedagogical purpose. Let us compare adult pet male chimpanzees with adult dogs raised as household pets. We really are not cheating in doing this. When we compare the behavior of animal species, we must consider the relevant qualities for humanity of the adult representative of the species, as by comparing adult male chimpanzees who had been pets as "children," with the adult development of the household puppy when it has become an adult.

Actually, contrary to the opinion of some children and adults, a dog does *not* develop actually *human* intelligence; the pet dog acquires what might be described as an "echo" of human intelligence.²⁵ Here, the dog out-classes the chimpanzee. The pet dog develops what appears to be something resembling a hu-

25. My wife and I have "owned" a number of dogs: several Irish Setters, two Great Pyrenees, and one West Highland White Terrier. There are "breed" characteristics, but there are also developed "personalities," which are manifest as expressed "insight" specific to the dog and to the household into which it is assimilated while a puppy.

man form of personality; that dog tries to simulate (“imitate”) the personality of a human being, perhaps regarding its owner as representing, in ethical and family terms, the kind of authority due its mother, father, or human sibling.²⁶ The relevant distinction was noted by the Cardinal Nicholas of Cusa, who reported this kind of apparent simulation of human intelligence among animals. *Thus, the Noösphere “educates” the Biosphere.*

For purposes of an introductory, exploratory discussion of such matters, we might say that the dog’s simulation of what seems to have been the behavior of the higher order of living species, the human individual, is “programmed,” although—*God forbid!*—never “digitally” programmed. Cusa compared God to the “soul” of man, as man to the “soul” of the animal, that in appropriate terms of reference.

The content of those preceding paragraphs is to be treated as a necessary, brief, playful, but nonetheless a valid, introductory discussion, that as a matter of providing a background orientation for the discussion of the “hard point” which I am about to introduce thus.

The Folly of Sense-Certainty

Among all known species existent within our Solar System, the form of human mental performance which is specific to the conception of the *ontologically infinitesimal* principles of physical science, such as Kepler’s discovery of gravitation (and also of the discovery, as by J.S. Bach, of true Classical artistic composition), is unique, among all species, to human individuals. Thus, to the extent that the human brain might be considered, wrongly, by some, as merely a higher order of development of animal brains, that assumption leaves no basis for a truly noëtic intellectual creativity of the quality expressed by the modern cases of Cardinal Nicholas of Cusa, Kepler, Fermat, Leibniz, Riemann, or of J.S. Bach, W.A. Mozart, and Ludwig van Beethoven, creativity which is not so encountered in the biological mental-perceptual apparatus of the brain-function of mammals in general.

The clue which points toward a solution for the relevant mystery, may be found through examining a certain systemic quality of paradox in Kepler’s discovery of the harmonic organization of the Solar System. The specific quality of that discovery, by Kepler, which has driven even many serious, if somewhat misguided scientists into a fury, is that Kepler’s solution involves the principled, *musically* defined, *Lydian*, *Florentine bel canto* faculty of hearing. Whereas, as a matter of contrast, the scientist who was heavily indoctrinated in the Sophistry of Aristotle-Euclid, will tend, with rare exceptions, to react with his or her own personal performance of some sort of a “freak show,” when confronted with the implications of the indispensable function of hearing, as Kepler was confronted: when confronted with the paradox which threatens the peaceful contemplation of any merely visual conception of organization of space-time.

“Tuning” is an extremely useful piece of scientific pedagogy for the purpose of defining the experimental subject, when confronting that acutely paradoxical fact. It is a related fact, that all evidence available indicates, that *there is nothing intrinsic to the apparent physiological organization of the brain-function of the mammals which accounts for the unique role of the individual human mind in reproducing the phenomena of the Noösphere.* There is something, related to the notion of “tuning,” as defined by Kepler’s discovery, and by J.S. Bach, which accounts for this unique species of experimental fact.

The relatively more obvious point made by that sort of “thought experiment,” is that a sane reaction to Kepler’s treatment of the paradox of harmonics in defining the measurable effect of the principle of gravitation, compels the seasoned experimentalist to accept the fact that his, or her own sense-perceptual apparatus is an array of instrumentations, to such effect that the sundry “meter readings” from that inborn array of experimental apparatus must be treated as just that. So, what seems almost self-evident, almost Euclidean or Cartesian, if only one of the human senses is being considered, may be transformed into the inducing of a state of stark confusion in the mind of the unwitting, when two, or more, different human senses, such as sight and hearing, are being applied to define a single common image of the common experimental subject.

For example:

In the relatively simpler case, the naive student “believes” it to be more or less self-evident, that astronomical space is defined by discrete objects, such as planets, moons, and sundry forms and sizes of intra-Solar-System particles, each and all appearing to float when such phenomena are assessed as being within a background-medium of what is presumed to be, in its own nature, as Cartesian empty space. Similarly, the Max Planck-hating dupes of Ernst Mach, such as Ludwig Boltzmann, may proffer a childish misreading of what he considers, on principle, as reducible, conceptually to a percussively organized gas system.

In these cases, the experimental validity attributed to the mechanistic representation, is to be recognized as the result of interpreting what may be, within limits, experimental phenomena viewed in terms of a mechanistic fantasy derived from the *prioristic*, mechanistic methods of Aristotle and Euclid. As long as ideologues continue to interpret the evidence, axiomatically, on reductionist presumptions, they may be self-satisfied with their formulations. This may continue until they are faced with the experiment which presents what they must view as profoundly anomalous results, as Riemann’s 1854 habilitation dissertation shows, or as Kurt Gödel, in 1931, demonstrated the fraudulent character of Bertrand Russell’s *Principia Mathematica*.²⁷

Such childish Euclidean-Cartesian fantasies as those of the followers of Mach and dupes of Russell, are precisely the source of the confusion of the physicist experiencing a banshee-fit

26. We had a Great Pyrenees, who accepted a West Highland White Terrier as a puppy of the family, but seemed, over years, to grow increasingly troubled by the fact that that puppy never seemed to be growing up.

27. Kurt Gödel, “On Formally Undecidable Propositions of *Principia Mathematica* and Related Systems,” (1931), in *Kurt Gödel Collected Works*, Vol. I (New York: Oxford University Press, 1986), pp. 144-195.

when being presented with Kepler's harmonic composition of the gravitational, wrongly presumed "action-at-a-distance" field of the Solar System,²⁸ or in that domain of Planck's work which the radically reductionist dupes of the positivists (e.g., radical empiricists) such as Mach, or one like Bertrand Russell, misidentified as quantum "mechanics." At that point, a few words from a Kurt Gödel or Albert Einstein are sufficient to send the radically reductionist cult-followers of Mach, Russell, Norbert Wiener, John von Neumann, et al., into howling fits worthy of the dismay which might have been expressed, at the close, among the suffering characters of H.G. Wells' *The Island of Dr. Moreau*.

The alternative to reductionist fantasies of "sense-certainty," is to consider physical space-time as a true continuum of existence-in-motion. That means that the exclusion of the notion of something existing which must yet be moved, in favor of the accepting the realization of that "motion," motion otherwise recognized as action in the sense of a continuing process of development, must be accepted as the intrinsically ontological quality of existence. This means *dynamic* existence, not in the sense of the reductionist's nonsense word "thermodynamics," but as in the method of the ancient Pythagoreans and Plato, or the modern followers of Cusa, Leonardo da Vinci, Kepler, Fermat, Leibniz, Riemann, et al.

Rejection of sense-certainty does not mean rejecting the role of our senses; rather, we must recognize that the senses are indispensable in the two respects indicated here below. What must be rejected, for the sake of competent science, is the hedonist's blind faith in "sense-certainty."

Firstly, we must appreciate the implications of not only Helen Keller's plight, but her accomplishment in overcoming what might have seemed her hopeless situation. Her achievement does not justify deprecating those senses whose use she lacked; but, rather, appreciating the importance of the new instruments of cognitive method and apparatus which science develops, new instruments which enable mankind to explore such otherwise forbidden realms as the universe and sub-atomic space-time.

Second, although the relatively competent expressions of modern science have demonstrated, afresh, that the picture of the real world given to us by the senses as such is not the real world, but is, at best, only a faithful shadow of reality: nonetheless a shadow on whose assistance we depend for guiding our investigations into the real world of the unseen. The most significant outcome of recognizing this irony, is that we must learn to discard all forms of naive sense-certainty, such as the *a priori* Sophistries of Aristotle, Euclid, and Descartes. We then learn to use those senses, both those given to us by birth, or instruments we adopt as supplements to the senses, to discover more and more of the nature of the actual universe which we inhabit, and, in that manner, and in that process, discover the most precious among all of the secrets of science, the true

28. The case of the Crab Nebula should, therefore, drive him wild!



Library of Congress

Helen Keller's accomplishment in overcoming both deafness and blindness shows that cognition is not based at all upon sense-certainty. Here, Keller is exploring the shape of a statue.

identity of ourselves, and our place in this Riemannian universe at large.

Riemann Again

In treating the mental disorder called "sense-certainty," we must take into account, from the outset, that the problem of sense-certainty as it has confronted us in European culture, persistently, since approximately the death of Plato, is a product of the rise of what is known as the form of European Sophistry attacked by Plato's dialogues. This means attacking, specifically, the form of Sophistry which ancient, medieval, and modern Sophistry have inherited from Aristotle and such among his notable followers as Euclid.

I repeat: there is crucially significant, surviving evidence to the effect, that the great trans-oceanic maritime cultures whose experience is reflected to us from the ancient Egypt known to Solon, the Pythagoreans, and Plato, possessed a scientific method, identified as *Sphaerics*, which was largely free of those falla-

cies of sense-certainty which I have ridiculed in the opening pages of this present chapter of the report. Also, we must recognize, that there have been traces of the scientifically healthy, pre-Euclidean scientific world-outlook radiated by Plato, as by currents of Judaism and Christianity typified by Philo and the Apostle Paul, at various times and in various locations, over the course of ancient and medieval European times prior to the great work of Nicholas of Cusa in founding modern science.

In all modern European history, there was a great struggle, from the time of Kepler, Fermat, and Leibniz, until that of Riemann, during which a lunatic, so-called Cartesian and Newtonian view of science, that of the *a-priorism* of Aristotle, Euclid, Galileo, and Descartes, was made prevalent, either through the imperial influence of the Habsburg and other Inquisitions, or by the influence of the Anglo-Dutch Liberal imperium; *until Riemann broke open the doorway to truth with his 1854 habilitation dissertation.*

On this account, it must be recalled, that the echoes of Cusa, Leonardo da Vinci, and Kepler, were expressed in the mid-Seventeenth Century of France, under the leadership of Cardinal Mazarin, Jean-Baptiste Colbert, and Gottfried Leibniz, until this progress was interrupted by the emerging primacy of a modern Liberalism which emerged during the Anglo-Dutch Liberal wars leading into the February 1763 launching of the neo-Venetian form of the world's presently continued, British empire-in-fact. So, despite the later great Eighteenth-Century Renaissance led by Abraham Kästner, Gotthold Lessing, Moses Mendelssohn, Friedrich Schiller, and the Monge-Carnot Ecole Polytechnique, the Jacobin Terror and the reign of the predator Napoleon Bonaparte, crushed, once again, the new, late Eighteenth-Century Classical Renaissance.

That tyranny of the Habsburg Inquisition of Grand Inquisitor Tomás de Torquemada, on the one side, and that of the Anglo-Dutch Liberalism of Paolo Sarpi and his followers, on the other, had already established the massively corrupting influence of Paolo Sarpi's system of Liberalism over science, art, and politics. The British imperial tyranny over the Vienna Congress's Europe, and the British deployment of the early-Nineteenth-Century Spanish monarchy's continuation of British John Locke's earlier promotion of the trans-Atlantic slave-trade, continued to dominate science until the circles of that great organizer Alexander von Humboldt succeeded in unleashing the great revolution in physical science of Wilhelm Weber, Lejeune Dirichlet, and Bernhard Riemann. Once more, that same Liberal sophistry dominates our modern European culture, with its schools, universities, and popular opinion, still today.

It was upon the signal contributions of the later geniuses, such as the great, later achievements of such exceptional geniuses as Vernadsky and Albert Einstein, on which the net progress of science has chiefly depended. During the entire sweep of the 1854-2008 interval to date, the uttering of Riemann's 1854 habilitation dissertation, has become the great long wave of revolution on which the greatest net achievements of science have, subsequently, thus far depended.

Thus, as great as was the revolution which Bernhard Riemann launched in his 1854 habilitation dissertation, there was nothing essentially new to European civilization's science in the great principle through which Riemann shattered the darkness of Euclidean superstition. Once the 1854 habilitation dissertation is understood, its origins, its outgrowths, and its implications for now, were, already, essentially grounded in fact.

Since Riemann's habilitation dissertation, the principal source of moral rot in modern physical science, has been that great hoax, called "thermodynamics," as crafted by the scientifically and morally decadent circles of Clausius, Grassmann, and Kelvin. This corruption is typified, to the present date, by what has become that implicitly mass-murderous, Machian hoax and fraud of modern mechanics, the hoax named "The Second Law of Thermodynamics."

That much said thus far, the considerations which I have outlined up to this point in the report, have taken us, repeatedly, during the preceding pages, up to the verge of the great conclusion standing before us: the notion of *the ontological infinitesimal.*

The Noösphere as Such

The development of the concept of the Noösphere has depended essentially on the insight into that evidence from that approach to physical chemistry by Mendeleev and Harkins, which Academician Vernadsky summarized in the middle of the 1930s. Although there is often a temptation by some reporters to locate the discovery of a principle of life by Pasteur, rather than crucially significant phenomena expressed by living processes, Pasteur himself rejected a precocious conclusion in the matter; he did so correctly, on the premises of his knowledge of what a proper scientific method must require as adequate proof.²⁹ We, still today, must show similar caution in stating claims pertaining to the Noösphere; however, as much of what we know to have been proven respecting the implications of the proven existence of the Noösphere must be accepted, despite deeper issues yet to be defined.

Today, as I have emphasized the implications of the questions implicitly posed by the referenced work of Woese et al., we must be concerned with a higher order of challenge, the Noösphere, as Vernadsky clarified the questions respecting the Biosphere. Living processes express a different physical chemistry than non-living processes, thus defining a specific phase-space known as the Biosphere. Then, how shall we approach the higher order of subject, the Noösphere?

We know that the Noösphere has been discovered by (actually) Academician V.I. Vernadsky. We also know from crucial experimental evidence, that the Biosphere is dominated functionally by the Noösphere: that to such effect that the Noösphere contains the Biosphere functionally, such that no generalizations respecting the Biosphere can exclude the superior role of the Noösphere.

We must recall, that the proof of the discovery of the hypoth-

29. LaRouche, "Vernadsky & Dirichlet's Principle," *op. cit.*



R. Gehrz/NASA-JPL-Caltech

The Crab Nebula presents an array of paradoxes to the scientist. It is rapidly changing, even pulsating; yet it is presumed to be immensely large. The changes that occur in its structure take place synchronously throughout it, seemingly like waves propagating at a velocity faster than the speed of light! Such anomalies drive the reductionists crazy.

esis by Vernadsky was supplied by the evidence of the growth of the accumulated mass generated by the Biosphere's phase-space as products specific to the effects and residues of the masses of living processes. The growth of the Biosphere, so defined, relative to the phase-space generated as supplied by non-living processes, supplied the proof needed, even though we have yet to receive a competent experimental definition of "historical" origins of life as such.

The same standard required to define the Biosphere is to be applied to the case of the Noösphere, with one very distinct qualification. Crucial is the evidence on which any competent science of physical economy depends: that the percentile of the mass of our planet representing products of human cognitive activity not otherwise produced by the processes of the Noösphere itself, has been increased through, chiefly, the effects of scientific and related advances in the goals and technologies of human societies.

The crucial fact thus emphasized, is that this increase of the relative mass of the Noösphere, is, uniquely, the now well-defined product of what is termed *noësis*. This pertains to activities,

which are expressed uniquely by their ontologically infinitesimal expression (as I have already emphasized at earlier points of this report), as those processes of discovery of true universal physical principles which have no place in the reductionist methods of ancient Sophists such as Aristotle and Euclid, or in modern empiricist and related practice.

*This distinction of the Noösphere confronts us, at least typically so, with its evidence of the paradoxical type of case, an anti-entropic case, in which the future determines the present.*³⁰

For example: in the case of the Biosphere, we have had the relative advantage of being able to define the Biosphere by reference to the higher state of organization in the universe which contains the definition of the Biosphere, the Noösphere. We can not approach the subject of the Noösphere with such an available kind of advantage. The paradoxical effect is more or less limited to the fact that it is the discovery of a principle which often serves as the cause of a qualitative change in the quality of effect of human action (for example) on the universe. This, in turn, confronts us with the factual existence of the discovery of a necessary truth of practice (i.e., Classical Platonic hypothesis), this

even before the relevant, new experimental principle of action was *discovered negatively*.

To illustrate the existence of such points: such an anomaly is suggested, although not otherwise known to have been proven, yet, by the evidence of the ostensibly anomalous ordering of certain kinds of changes which occur in the Crab Nebula.

Take, for example, the related fact that it was Fermat's remarkable, unique discovery of the principle of least action, which prompted Leibniz to overthrow the authority of Huyghens' cycloid, and to base a universal physical principle of least action on the analog functions which led to this revolution in defining the notion of actual physical principles.

These and related considerations lead us toward three great paradoxes.

First, that the greatest moments of scientific discovery are those in which a revolutionary change *in the future change of the ordering in our universe of practice* appears to some human

30. This has been the "secret" of my unique, current success as the most successful long-range forecaster in economics.

mind as an inevitable consequence of evidence, a universal principle, yet to be employed in practice. How has this been possible?

Second, what is the mysterious, yet undeniable power of the individual human mind's design which permits an individual human being, but no animal, to make such a type of valid discovery of the necessary change in principled modes for shaping of the future?

Third, how does the individual human mind manifest such a unique power, with no precursor for this in the Biosphere as such?

Is it some principle of "tuning?" Has the development of the human mental-biological apparatus taken the human species to a point at which it is "tuned into" a higher power in the universe, a higher power which is not only expressed as truly anti-entropy, as defined by the great Eighteenth Century mathematician Abraham Kästner, but a supreme universal physical principle of anti-entropy? So, Philo of Alexandria condemned the Aristotlean's theological insistence on the self-inflicted, permanent impotence of the Creator, and did so on the basis of the strongest quality of argument in evidence against such an absurd theology, and, implicitly, against an absurd, Aristotelean, Claudius Ptolemy-like misconception of science.

There are two cases of such crucially significant behavior. In one case, there is the universe in the large, as governed by an anti-entropic principle driving the universe into successively higher qualitative states of organization as a universe. In the other case, as posed in **Genesis 1**, mankind acts upon its place in the universe to similarly anti-entropic effect.

In the other aspect of the matter, we have the evidence that the human mind has a potential quality which, by sheer weight of definition, is not a product of its biology as we define biology today, but the "tuning" of the human form of thinking to agreement with cognitive powers which have never been shown to exist in lower forms of life. Yet, as is shown by the growth of the Noösphere, relative to the Biosphere, this power of the human mind is fully efficient within our universe.

As Nicholas of Cusa presented the case, as our Creator of the universe is to man, so man mimics that Creator in man's spiritual power over, and obligation to caring for dogs.

The more modest point to be proffered in this context, is the evidence that the universe is intrinsically anti-entropic, and that the obligation which mankind must meet if mankind is to survive, is to act in the way the Creator of our universe has governed. We are properly "tuned" to be creatures devoted to the service of anti-entropy, such that those who express a contrary



Mankind's effect on the universe is anti-entropic! Here, NASA scientists and engineers in the Mission Operations Control Room celebrating after Apollo 11 made man's historic first landing on the Moon, July 24, 1969. Inset: a close-up view of an astronaut's footprint in the lunar soil during the Apollo 11 mission.

view, such as the Malthusians and former U.S. Vice-President Al Gore today, are therefore evil in what they do in service of entropy.

With respect to the great question which has been the subject of my report here, we are in a predicament with practical implications like those confronted by Louis Pasteur on the matter of life. We do not have the true solution; but, we must not avoid the implications for the present practice of science, of the unanswered, stubbornly persisting question which it would be incompetence to avoid. In science, until we pose the question, as I have proposed we do here, we will never begin to discover the answer.

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